Proceedings of IAC 2022 in Vienna

Vienna, Austria

August 5 - 6, 2022

Management, Economics and Marketing (IAC-MEM)
Teaching, Learning and E-learning (IAC-TLEL)
Engineering, Transport, IT and Artificial Intelligence (IAC-ETITAI)

ISBN 978-80-88203-28-5

CTU
CZECH TECHNICAL UNIVERSITY IN PRAGUE

CIAE
Czech Institute of Academic Education z.s.

Impressum

Title:

"Proceedings of IAC 2022 in Vienna", ISBN 978-80-88203-28-5

August 2022 in Prague, *1st edition*

Publisher / Creator of CD / Copyright holder:

Czech Institute of Academic Education z.s.

Address of Publisher:

Vodnicka 309/20, 149 00 - Prague 4, Czech Republic

Email: info@conferences-scientific.cz

Web: www.conferences-scientific.cz

Technical editorial staff this CD:

Helena Kratochvílová

Radek Kratochvíl, Ph.D.

Název:

"Proceedings of IAC 2022 in Vienna", ISBN 978-80-88203-28-5

Srpen 2022 v Praze, *První vydání*

Vydavatel / Tvůrce CD / Nositel autorských práv:

Czech Institute of Academic Education z.s.

Adresa vydavatele:

Vodnická 309/20, 149 00 - Praha 4, Česká Republika

Email: info@conferences-scientific.cz

Web: www.conferences-scientific.cz

Technická redakce tohoto vydání:

Mgr. Helena Kratochvílová, DiS.

Ing. Radek Kratochvíl, Ph.D.

Conference Scientific Committee / Reviewers

Assoc. Prof. PhDr. Maria Janesova - Slovakia
- *Czech Technical University in Prague*

Mgr. Helena Kratochvilova - Czech Republic
- *Czech Institute of Academic Education*

Piotr Jednaszewski, Ph.D. - Scotland
- *St Mary`s Academy Ltd*

Assist. Prof. Mario Konecki, Ph.D. - Croatia
- *University of Zagreb, Faculty of Organization and Informatics*

Assoc. Prof. Souvik Pal - India
- *Sister Nivedita University, Depart. of Computer Science & Eng,*

Assoc. Prof. Dr. Ioan-Gheorghe Rotaru - Romania
- *'Timotheus' Brethren Theological Institute of Bucharest*

Assoc. Prof. Dr. Ömer Beyhan - Turkey
- *Konya NE.University, A.K. Education Faculty*

Assoc. Prof. Anjali - India
- *Department of Computer Science & Engg, GNIT, Mullana*

Assoc. Prof. Jitender Grover - India
- *Department of Computer Science & Engg., M.M. University*

Radek Kratochvil, Ph.D. - Czech Republic
- *Czech Institute of Academic Education, Czech Technical University in Prague*

Assist. Prof. Dr. Mohamad H. Atyeh - Kuwait
- *School of Business, Australian College of Kuwait*

Assoc. Prof. Dr. Ramazan Sak - Turkey
- *Yüzüncü Yıl University, Faculty of Education*

Assoc. Prof. Dr. İkbal Tuba Şahin-Sak - Turkey
- *Yüzüncü Yıl University, Faculty of Education*

Assist. Prof. Dr. Ayşegül Derman - Turkey
- *Konya NE.University, A.K. Education Faculty*

Assist. Prof. Dr. Serdar Derman - Turkey
- *Konya NE.University, A.K. Education Faculty*

Assoc. Prof. Dr. Fethi Kayalar - Turkey
- *Erzincan University, Faculty of Education*

Prof. Dr. Thomas Rachfall - Germany
- *Hochschule Merseburg*

Dr. Dirk Förster-Trallo - Germany
- *Hochschule für Technik und Wirtschaft Berlin*

Editors and Technical publishing board:

Mgr. Helena Kratochvilova - Czech Republic
Radek Kratochvil, Ph.D. - Czech Republic

Organizing Committee:

Mgr. Helena Kratochvilova - Czech Republic
Assoc. Prof. PhDr. Maria Janesova - Slovakia
Radek Kratochvil, Ph.D. - Czech Republic

Table of Contents

Management, Economics and Marketing (IAC-MEM 2022)

The Effects of Television Advertising on Children Aged 7-15

Şükrü GÜVEN[a*] , Memiş KARAER [b]

[a] *Selcuk University Beysehir Ali Akkanat Vocational School, Konya, Türkiye, sukruguven@selcuk.edu.tr*
[b] *Selcuk University Akören Ali Rıza Ercan Vocational School, Konya, Türkiye, mkaraer@selcuk.edu.tr*

Abstract

The concept of ethics in television advertisements has been the subject of many discussions. The lack of attention to ethics in television advertisements brings children to a situation that connects them to the screen, directs them to continuous consumption, has a negative physical and mental effect and transmits misleading information. The phenomenon of keeping the viewing rate on television channels high throws some notions into the background in the broadcasts and visuality is brought to the fore by using the latest technological software and devices. Children are the most affected by this situation. Fast-moving visuals, different colors and tones of voice come to the fore rather than content, and harmful and malicious subliminal messages affect children. Due to the continuous and frequent display of advertisements, the use of characters loved by children and similar reasons, an involuntary perception occurs in children. In many parts of the world, it is seen that children spend time in front of the television for long periods of time due to their passion for television. Therefore, children have to watch not only the broadcasts made for themselves but also the broadcasts outside their own age group. Uncontrolled program monitoring causes a number of prejudices, moral value losses, and effects such as perceiving imaginary products as real. Legal regulations should be improved to ensure that children are less affected by television advertisements and broadcasts, that controls should be carried out more properly by the state, and that parents should be careful and selective about broadcasts.

Keywords: Television, television commercials, media tools, children and advertising.

1. INTRODUCTION

In today's world, it has become imperative to transfer information about the products that are in a fierce competition and whose number is increasing day by day. Because the consumer does not have the knowledge to distinguish between benefit / harm in this product type. Therefore, it is imperative to take action against the consumer. It should be aimed that this action can give accurate results for the consumer and the seller.

Consumers should know all kinds of information about the product and the benefits it will provide to them in the purchase of the product. The most important and even the most prominent of this information is the advertisements made through mass media. Therefore, advertisements offer the opportunity to define the variety of products as a source of information and in that segment. In this context, accurate information transfer is the main task of the advertiser (Üstündağ, 2020).

Different ways are used to reach the target audiences. By examining the socio-economic status of the target kits, the product and the service to be provided are made attractive and it is tried to create demand or increase demand.

2. THE PSYCHOLOGICAL FUNCTIONS OF ADVERTISING AND CHILDREN

Advertisers have an idea of why consumers want to buy a product. In general, the products purchased according to the need can be directed to consumption by entering into an action to purchase even if there is no need in some

* Corresponding author.

cases. A credible and motivating advertisement can lead to the purchase of a product. This shows the importance of advertising (Dal & Dal, 2015).

For this reason, branches of science that examine human behavior and causes such as psychology, demography, social psychology come to the forefront. Ads that deliver messages at different levels; it often arouses impulses to buy. In this direction, while there are advertisements focused on direct sales, sometimes subconscious placement is made by processing elements such as "more happiness, more wealth" etc. (Yaylacı, 1999).

On the other hand, considering the opposite of this process, ideas such as "if you do not buy this product, something will be missing" are put forward. With subliminal product placement, adults subconsciously experience an encouraging imagination similar to children. Therefore, the value judgments to be made are accepted involuntarily or sometimes rejected (Torlak, 2001).

Since children, who have a minority that cannot be underestimated in society, are vulnerable to external factors, spend more time on social media and television than they devote to reading, their lives are affected by advertisements and accordingly changes occur in their material and spiritual values. Some scientists emphasize that children are corrupted by the effect of these changes (Bağrıaçık, 2014).

Sometimes the family and the child can also be in conflict about value judgments. Research has shown that because of this conflict, children are not victims of our defense against advertisements. There is often a debate between the child and his family about the choice of what to watch. What the family watches when children are young affects what their children will watch. Therefore, a conscious advertising choice will positively affect children's value judgments.

3. THE EFFECT OF TELEVISION AND CHILDREN

Children generally use television because they find it entertaining, while adults use it more for entertainment purposes. Since the notion of selectivity in perception is less in children, it has a more destructive effect than adults.

Parents who see television as responsible for some of their children's negative behaviors; they also see television as a caregiver or as a helper in household chores. Television when viewed from the child's side; It is the largest communication tool with the ability to transfer messages, visual elements by combining them with music and attention-grabbing sounds. During childhood, which is most open to learning, television sometimes appears as a teacher. Therefore, in the programs broadcast, themes are often seen to affect the personality and spiritual aspects of children. On the other hand, emerging behavior patterns cause positive behaviors in both children and adults. For this reason, the heroes that children watch with pleasure become role models for children (Gümüş, 2013). How should we protect children from the negative effects of television, which seems to be quite innocent from this perspective?

Childhood is a period in which social changes are excessive and fast, and mental and physical changes are experienced. It is an important age range for the formation and shaping of perceptions in children from the age of zero to six years. In this period, the fact that television is in the first place in terms of visuality and auditory is a tool whose importance cannot be ignored in the development of children.

In a study conducted by RTÜK, it was determined that children in the 7-15 age group spent a large part of their time watching television. For this reason, the planning to be made in the presentation of the information and images to be transferred is of great importance. Programmers who will prepare advertisements, cartoon characters, etc. designed especially for children need to be responsible, prudent communicators. However, it is beneficial for the programs to be broadcast to be supervised by an expert team of psychologists (RTÜK, 2013).

The mental communication that occurs between television and the audience is described as the process of "creating meaning". Any program that is being watched has a positive or negative meaning in the viewers. Television is a feature that reinforces and develops what people learn in their normal lives and at the same time gives them experiences by transferring information and images from all over the world. Since it is a great media tool, it is known to cause some changes and developments on children (Mutlu, 1991).

Television has important features such as showing the mediocre well, creating an effect as if it were real and being able to believe what is broadcast. In terms of these features, it is more effective than other media elements. Television is thought to affect the habit of reading books, doing sports, etc. of many segments of the society and causing these habits to decrease or be left. At the same time, especially child audiences have negative effects on things like creating something and dreaming. All innovations in the society are brought to the agenda through media tools and removed from the agenda in the month. The fact that media tools have such an impact is primarily reflected on children, as in all segments of society. The biggest negative factors created by television are violence, immoral situations and the phenomenon of consumption (Tayla, 2011) (Ülken, 2011).

Children are affected by television programs and advertisements at different rates according to their environmental conditions. At this point, the pros and cons of television are discussed all over the world. Because although television is useful, it is a communication tool that can be harmful for children and young people in need of protection. When Paracelsus' statement "Everything is poison, the important thing is to be able to adjust the dose" is adapted to media tools, it is impossible not to see that everything that is excessive can be under the influence of poison. Paracelsus'

quote becomes more meaningful when a student who spends 900 hours a year in school devotes 1500 hours to television (RTÜK (2), 2003).

Television in children; sleep problems, visual impairment, obesity, hepercholesterolemia, etc. are observed in physical negativity and antisocial, negative and incompatible information about daily life, aggressive etc. psychosocial disorders (Kaya, 2008). The negative aspects of television on children can be listed as follows:

1) Increasing the impact of being a consumer society,
2) Gender identity phenomenon becoming questionable,
3) Deterioration in parent-father relations,
4) Increase in violent tendencies,
5) Decrease in reading, thinking and success,
6) Increase in global alienation,
7) Corruption in the concepts of language, religion and homeland,
8) Loss of childhood and the disappearance of innocence.

The fact that children who try to resemble many movie heroes such as Spider-Man, Cat Girl, etc. and who lose their lives while trying to imitate what they do cannot distinguish between fiction and reality is a clear indication of the extent of the influence of the media (Kalkan, 2008).

4. WHAT SHOULD BE THE IMPACT OF THE FAMILY?

Television programs affect a wide range of people and do not single out any segment for this reason. Children, who are the most important of these groups, may be exposed to positive or negative effects through the programs they follow during the mental and physical development periods. Therefore, children need to be protected and this duty should be the first of all with the families. However, such an important task should not be left only to families (Güngör, 2014).

The other leg of this important task is the publishers. Media elements have the task of forming public opinion, establishing a bond between the rulers and the public, etc. Although the press and broadcasting organs have the right to spread and make programs in a democratic environment, they should make programs under control and supervision. The rights of individuals, which are the basic element of society, limit the media elements within a certain framework (Güngör, 2014). During infancy, the responsibility for the first habits, such as directing the child to the television as a share of silence, belongs to the mother and father. In addition, the attitude of parents to television directs the habits of children.

All media elements, especially television, continue to be a major obstacle in family socialization. The fact that parents see the television as a babysitter, feed the children's meals in front of the television, and direct the children to television and other media tools in order to do their own work reduces the interaction within the family and opens the door to all the negativity. Families who try to maintain media control start with television. Giving the TV a passcode and automatically setting the closing times can provide some control. However, the most important factor is to raise awareness of children on this issue.

The most important thing that parents feel towards their children is to protect them from danger. While this is the case, the mothers and fathers who put their children in front of the television leave a gazelle in front of the lion. It is difficult to understand to be indifferent to the fact that this wrong behavior leaves significant harm on children.

The most important factor in family socialization is that parents spend more time with the children. By closing the media elements, activities such as being with children, chatting with them, discussing and exchanging ideas on various topics, reading books together, etc. increase both socialization and family ties (Abuzar, 2017).

The most important problem for children in the messages given on television is that they see what they watch as real, that they seek their counterpart in their lives and that they cannot comprehend that these are fictions. Therefore, families have a great duty to save their children from this error. What kind of mistakes the publications make, that the events are distorted by telling them in different directions, should be explained to children from their childhood and they should be raised as a good media follower. Thus, creating an awareness at an early age can prevent disinformation that may occur in children.

One of the most important tasks for parents is to discuss the advertisements and television programs that their children see and teach them how to evaluate the messages and information they want to be given in them. In this context, it is observed that there are three different parental attitudes. The first type of parents are those who do not comment on the commercials and television programs they watch with their children. The second type of parents are those who explain the content and the messages given in a way that the child can understand. The third type of parents are the ones who control the content and time of the programs to be watched. Research on this subject reveals that the children of the second and third types of parents are less affected by advertisements and television programs. In the case of joint advertisements and television programs, the child can perceive that the content is approved by the parents

to remain silent. Therefore, the fact that parents are active and state right and wrong will cause the child to perceive correctly (Özben, 2009).

Postman, author of "Television: Entertainment That Kills," emphasizes that television viewers must be capable of a complementary value system in order to defend themselves. For children to be competent; It is necessary to develop their ability to criticize, think, etc., to increase the habit of reading books, and to ensure their participation in social activities (Postman, 2016).

Parents have a great duty for children who spend most of their time in front of the television. Parents should first be a good selector in advertising and television programs, control content, and not leave children alone. They should explain the content of advertisements and television programs to children and remove the question marks that may arise in the child's mind with clear explanations. It is a great benefit to limit the time to watch advertisements and television programs as much as possible.

5. PROTECTION OF CHILDREN FROM HARMFUL PUBLICATIONS

The influence of the elements of the media depends on the extent to which and how they are used. Although not watching television is not a solution, it is a controlled way to watch it against the elements that will constitute negativity (Akyüz, 1991). The following methods can be applied to protect children from harmful publications:

1. It should tell the child how parents should watch television.
2. The child should be told why the products that the child sees in the advertisements and wants to buy but cannot get are not bought.
3. Watching or not watching television should not be a reward or punishment.
4. Parents should set an example with music, sports, books, etc. outside of television.
5. Television should not be the center in the placement of the room.
6. This should be avoided as constantly changing channels causes a loss of concentration for children.
7. Children should be told that movies are fiction.
8. It should be aimed that watching television is within a plan.
9. Parents should check television broadcasts in advance and block those with harmful content.

6. CONCLUSION

In our country, in 1927, the relationship between media and children was processed within the framework of the Law on the Protection of Minors from Mischievous Publications and applied as the expression "Harmful to Minors" for media organizations. While children function as both entertaining and learning on the media, they also encounter product placement and direct advertising. In the meantime, since the age and cultural structures of the children are not taken into consideration, they are also confronted with harmful and cultural structure disrupting and changing elements.

In our country, it is seen that children spend a large part of their time outside of school in front of the television. Despite the change in technological elements, it has been accepted that the best tool to reach all segments of society is television. This recognition gives the necessary share to children, who are the most innocent and vulnerable part of society.

Under the leadership of the Supreme Council of Radio and Television, many institutions and organizations are working on the prevention of broadcasts and advertisements that will adversely affect the moral, mental and physical development of children. Some of these studies are as follows: "Smart Signs System", Good Sleep Children", "Media Literacy", "Thematic Channels for Children", etc.

Today, while regulations are being made on media elements, it is aimed that the globalizing world has a single order without considering the situations of societies. This situation is harmful for every society in the world and causes it to lose its own self.

In the protection of our children in matters such as bad content, subliminal message, violence, sexuality, cultural corruption, etc., the media elements have to fulfill their duties in the full sense, especially the state, non-governmental organizations, the private sector and the most important element, parents. In order to raise generations that are beneficial to their homeland and nation, it is necessary to raise the awareness of parents, educators and all segments that have direct or indirect contributions in the process. In this way, generations that have full self-confidence, consciousness, and make good use of communication tools will be able to grow.

References

[1] Abuzar, C. (2017). Televizyonun Aile Yapımız Üzerine Etkisi. Harran Üniversitesi İlahiyat Fakültesi Dergisi, 79-87.

[2] Akyüz, Y. (1991). Çocukların Televizyon Reklamlarına Karşı Korunması. Ankara Üniversitesi Eğitim Fakültesi Dergisi, 97-106.
[3] Bağrıaçık, Ç. (2014). Markanın tüketicinin karar sürecine etkisi: ilkokul ve ortaokul öğrencilerinin ailelerine yönelik çocuk giyimi sektörü üzerine bir uygulama. İstanbul: Hasan Kalyoncu Üniversitesi Sosyal Bilimler Enstitüsü Basılmamış Yüksek Lisans Tezi.
[4] Dal, N., & Dal, V. (2015). Çocukların tüketici olarak sosyalleşme sürecinde TV reklamlarının ve ailenin rolü hakkında teorik bir çalışma. Mehmet Akif Ersoy Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, 1(13), 371-388.
[5] Gümüş, S. (2013). Ebeveynlerin ve Çocukların Televizyon Reklam İçeriklerine İlişkin. Akademik Bakış Dergisi, 37, 1-19.
[6] Güngör, M. (2014). Okulöncesi Dönem Çocuklarının Televizyon İzleme Alışkanlıkları ve Anne Baba Tutumları. Mustafa Kemal Üniversitesi, Sosyal Bilimler Enstitüsü Dergisi, 11, 199-216.
[7] Kalkan, S. (2008). Televizyon Yayınlarındaki Zararlı İçerikten Küçüğün Korunması. Ankara: Gazi Üniversitesi Sosyal Bilimler Enstitüsü, Yüksek Lisans Tezi.
[8] Kaya, R. (2008). Edirne İl Merkezinde İlköğretim Okullarındaki Öğrencilerde Beslenme-Obezite-Fiziksel Aktivite İlişkisinin Değerlendirilmesi. Edirne: Trakya Üniversitesi Sağlık Bilimeleri Enstitüsü Yüksek Lisans Tezi.
[9] Mutlu, E. (1991). Televizyonu Anlamak. Ankara: Gündoğan Yayınları.
[10] Özben, Ş. (2009). Medyanın Çocuklar Ve Gençler Üzerindeki Etkileri. Yaşadıkça Eğitim Dergisi, 105, 11-19.
[11] Postman, N. (2016). Televizyon Öldüren Eğlence. (O. Akınhay, Çev.) İstanbul: Ayrıntı Yayınları.
[12] RTÜK (2). (2003). İlköğretim Çağındaki Çocukların Televizyon İzleme Alışkanlıkları Araştırması. Ankara: Radyo Televizyon Üst Kurulu Yayınları.
[13] RTÜK. (2013, 10 1). www.rtuk.gov.tr. RTÜK: https://www.rtuk.gov.tr/turkiyede-cocuklarin-medya-kullanma-aliskanliklari-arastirmasi-sonuclandi/2515 adresinden alındı
[14] Tayla, H. (2011). Televizyonla Yetişmek, Televizyon Şiddetinin Etkileri Üzerine Araştırma. Konya: Çizgi Yayıncılık.
[15] Torlak, Ö. (2001). Pazarlama Ahlakı. İstanbul: Beta Yayınları.
[16] Ülken, B. (2011). Televizyon İzlemede Anne-Baba Aracılığı İle Çocukların Saldırgan Davranışları Arasındaki İlişki. Anadolu Üniversitesi Sosyal Bilimler Dergisi, 11(1), 195-216.
[17] Üstündağ, A. (2020). Çocuk ve Ekran. Ankara: Eğiten Kitap.
[18] Yaylacı, Ö. (1999). Reklamda stratejik yönetim. İstanbul: Alfa Yayınevi.

The Development of Participation Banking in Turkey and its Place in the Finance Sector

Memiş KARAER[a*], Şükrü GÜVEN[b]

[a] *Selcuk University Akören Ali Rıza Ercan Vocational School, Konya, Türkiye, mkaraer@selcuk.edu.tr*
[b] *Selcuk University Beysehir Ali Akkanat Vocational School, Konya, Türkiye, sukruguven@selcuk.edu.tr*

Abstract

Participation banking, also known as interest-free banking, has emerged in countries where the Muslim population is densely populated. It is an organization that emerged with the aim of evaluating the finances of societies that are against interest due to the Islamic faith and mediating their investments. Although it dates back to the 1940s, it took until 1975 to put it into practice. They first started their activities with the Islamic Development Bank and another interest-free banking institution established in Egypt. The first participation banking activity in Turkey started in 1985. This system, which was called Private Finance Institution at that time, later turned into Participation Banking with the change made in the banking system. They have achieved a rapid development in the world and in our country since the date they were first founded. The fact that the interest-bearing system in other banks is not preferred by the sensitive Muslim community has benefited the development of participation banking. These institutions, which announced that they would make the financial system interest-free with different instruments, developed a system under the name of profit and loss partnership. Especially in recent years, participation banking has also been doing many transactions that other banks have done. They are able to respond to all requests of their customers. With the establishment of participation banks by 3 state banks in 2015 with the support of the state, their place in the sector is increasing. In this study, we investigated the development of participation banking in Turkey and its share in the financial sector. We have demonstrated the increases in their share in the financial sector. We came to the conclusion that they are increasingly preferred by society.

Keywords: Participation Banking, Banking, Financial Sector share

1. INTRODUCTION

The history of banking goes back as far as the history of money. It is known that the first banking activities were carried out in religious centers as they were considered reliable. In the past, people borrowed money from each other to meet their needs. They didn't want any surplus in return. In the future, this borrowing money exchange between people caused an additional cost. Due to reasons such as the excess of the need for developing trade and finance and the prominence of interests in human relations, an additional amount of excess (interest) has emerged in the exchange of money. Because of all these developments, the history of the interest element is as old as the date when the good or money learned to be accumulated by human beings. (Lightning,2020)

In general, in the early ages, human beings strongly opposed interest with the view that money, which they saw only as a medium of exchange, did not produce value where it stood. In Islam, although it is not known whether the initiative of the borrower will result in profit or not, and even if the result is profited, the amount of it is not known in advance, since the interest rate is determined in advance, it is considered haram because the profit or loss to be obtained from the use of this loan destroys the opportunity to share it fairly and evenly between the parties (Özsoy, 1994: 4).

Financial stability is essential for the development of national economies. Financial security is crucial for continued financial stability. Financial security is defined as all financial regulations and institutions that aim to limit or prevent losses to bank deposit customers in the event of a bank's liquidation or bankruptcy. Financial security and

* Corresponding author.

financial stability are ensured, thus creating an environment in which financial resources can be provided for economic growth (Kartal and Demir, 2017:34).

One of the requirements for faster, easier and more needy funds in financial markets is the wide variety of financial instruments traded in the market. The fact that the financial instruments traded in a country are not limited to a certain type and number and that there are sufficient types of instruments to meet all kinds of demands is important for the financial development in that country. Participation banks are financial institutions that contribute significantly to this diversity of instruments (Afşar, 2006:25).

As a result of the growth and globalization of economies in the world, they have also created the need for diversity in the financial field. In the Islamic geography, which has an important place, savings were kept under the pillow and not included in the economic sphere due to the fact that interest was forbidden. Financial institutions have also stepped in at this point and started to include the money of savers in the Islamic geography in the economy under the name of interest-free banking system. The Interest-Free Banking system, which first appeared in Egypt in 1960, has started to spread gradually. In Turkey, they emerged as the Financial Participation System for the first time in 1985. They have been an increasingly common system until today. They have started to have an increasingly important place in the world and our country's economy.

2. DEFINITION OF PARTICIPATION BANKING

In the current banking system, deposits collected from depositors in exchange for predetermined interest are used in the form of loans to those in need of funds at the interest rate determined by the bank. The most important point that distinguishes participation banking from traditional banking is that it provides participation share instead of interest. This system, which stipulates that participants participate in the results of their activities, is also known as interest-free banking (Özcan and Hazıroğlu, 2000: 9). The main purpose here is; is to effectively bring the capital accumulation of savers who do not want to receive interest in return for their savings to the economy.

It is also possible to define participation banking as institutions established in order to introduce their savings into the production process and operate with the understanding of profit-loss partnership (Takan, 2001: 16) of savers who do not deposit their savings in banks because they do not want to receive interest in return for their savings. Participation banking is an organization that works according to the principles of interest-free in the financial sector and carries out all kinds of banking activities in accordance with these principles. Participation banks make a significant contribution to the country's economy by distributing the funds they collect to individuals or organizations. (Özulucan and Özdemir, 2010:5) Participation banks; are organizations that provide alternative financing method services, operate in the financial sector, finance the real economy and provide banking services. These institutions are; In addition to performing banking services, they transfer the funds they collect from savers through current account and profit/loss partnership accounts to the real sector according to the principles of interest-free financing and share the resulting profit or loss with the savers (Tunç, 2000: 13). These institutions, also known as "Interest-Free Banking" or "Islamic Banking" in some countries, were established under the name of "Private Financial Institutions" in Turkey, and the name "Participation Banking" was adopted by changing the name in 2005 (Bayındır, 2007:246).

3. THE DEVELOPMENT OF PARTICIPATION BANKING IN TURKEY

The prohibition of interest by Islam caused Muslims to stay away from this phenomenon, and on the other hand, the lack of alternative institutions to classical banks caused the savings of these peoples to shift to non-bank ways such as gold, foreign exchange and real estate, that is, to the areas that do not contribute to production and to remain idle in a sense. (Bulut and Er, 2009:18) Accordingly, financial institutions that operate on the basis of no interest and that attract the savings in the hands of the people into the economy and thus provide additional resources to the capital needed for the development of the country have started to be established both in Turkey and in other Islamic countries. Participation banks operating in Turkey have developed more slowly than in other countries. (Uçar,1993:61) Private Financial Institutions, which were established with an interest-free mindset, were established by the decree of December 16, 1983 and numbered 83-7506. The communiqué on the decision was published in the official gazette dated 25 February 1984. After the entry into force of the relevant decree, "Al-Baraka Türk and Faisal Finans" financial institutions were established in 1985 and Kuveyt-Türk Evkaf Financial Institution was established in 1989 (Zerka and En-Neccar, 2009). The studies carried out to eliminate the problems created by the name of the private financial institution were carried out with the Law No. 5411 enacted in 2005; The institutions operating as a basis for collecting funds and lending loans through special current and participation accounts were given the name 'Participation Bank' instead of 'Private Finance Institution' (Terzi, 2013:4).

With the structuring of the banking sector in the early 2000s, the establishment of new banks was also made more difficult. For this reason, the total number of players in the banking sector has remained around 50 for many years. In 2005, 34 of the fifty-one banks operating in Turkey consisted of deposits, 13 of them were development & investment banks, and 4 of them were participation banks. In 2019, the total number of banks increased to 51 with a very limited number of new banking licenses. The number of participation banks has remained at four for many years. At the same time, all of these participation banks were privately owned. In 2015, the government established Ziraat Participation, the first public participation bank, in order to increase the share of participation banking in the sector. (Kevser,2020:121) Subsequently, Foundation Participation was established in the same year, but the operating permit was granted in 2016. For this reason, the number of participation banks in the sector remained as 5 again due to the cancellation of Bank Asya's license in 2016 and the commencement of Foundation Participation's activities. The establishment of Halk Participation Bank along with Ziraat Participation and Foundation Participation was also targeted by the government but did not materialize. In 2019, a new public participation bank entered the sector. Türkiye Emlak Participation Bank was established with the aim of operating especially in the housing sector. With all these developments, as of the end of 2019, 32 deposit, 13 development & investment and 6 participation banks operate in the Turkish banking sector (Table 1).

Table 1: Number of Banks in Turkey by Group (BDDK, 2020)

	Participation Banks	**Deposit Money Banks**	**Development and Investment Banks**	**Sum**
2005	4	34	13	51
2006	4	33	13	50
2007	4	33	13	50
2008	4	32	13	49
2009	4	32	13	49
2010	4	32	13	49
2011	4	31	13	48
2012	4	32	13	49
2013	4	32	13	49
2014	4	32	13	49
2015	5	32	13	50
2016	5	32	13	50
2017	5	31	13	49
2018	5	32	13	50
2019	6	32	13	51

The first participation bank established in Turkey (then known as the Private Finance Institution) was Albaraka Türk Participation Bank. Founded in 1984, Albaraka Türk started its activities in 1985. Kuveyt Türk was founded in 1989 and Türkiye Finans in 2005. The main shareholders of all three participation banks are foreigners. Of the six participation banks, only Albaraka Türk's shares are publicly traded and traded on Borsa Istanbul.

In terms of asset size and many other financial indicators, Kuveyt Türk is the largest participation bank in the sector. According to 2019 year-end data, Kuveyt Türk has a 36.7% share in the participation bank sector with an asset size of close to TL 105 billion. This participation bank is followed by Türkiye Finans with a share of 18.4% and Albaraka Türk with a share of 18.1%. Founded in 2015, Ziraat Participation and Foundation Participation also

managed to increase their shares to over 10% in the relevant period. Here, the support of the public is especially important in terms of providing funding resources. The newly established Emlak Participation also reached an asset size of TL 9 billion at the end of 2019. In addition to its financial size, Kuveyt Türk also draws attention with its extensive branch network. While serving its customers with 431 branches, Türkiye Finans, which is its closest competitor in this sense, has 310 branches.

Table 2: Participation Banks Summary Information (As of 2019) (BDDK, 2020)

	Albaraka Turk Participation Bank	**Kuveyt Türk Participation Bank**	**Türkiye Emlak Participation Bank**	**Türkiye Finans Participation Bank**	**Foundation Participation Bank**	**Ziraat Participation Bank**
Year Built	**1985**	**1989**	**2019**	**2005**	**2015**	**2015**
Total Assets (thousand TL)	51.392.368	104.439.345	9.282.271	52.427.410	30.348.784	36.392.174
Total Credits (thousand TL)	30.880.921	57.926	33.272.689	33.272.689	18.770.501	29.565.030
Total Collected Funds (thousand TL)	39.769.408	85.494.387	39.974.514	39.974.514	22.953.215	25.457.245
Total Equity (thousand TL)	3.821.929	6.821.290	4.827.079	4.827.079	1.960.693	3.166.828
Number of Branches (Units)	230	431	310	310	104	93
Number of Personnel (Units)	3.791	5.955	3.461	3.461	1.322	1129
Partnership Type (Private/Public)	Özel	Özel	Kamu	Özel	Kamu	Kamu
Place in Participation Banking According to Asset Size	18,10%	36,70%	3,30%	18,40%	10,70%	12,80%

Branching is of great importance in the development of the participation banking sector in Turkey. The physical branch provides a platform for the safe collection of savings and their meeting with those in need of financing. In the execution of banking transactions (money order, bill payments, etc.) The branches used in the branch still maintain their importance despite the spread of alternative distribution channels and internet banking today.

While the share of deposit banks in the number of branches was 95.0% in 2005, this situation has decreased to 89.1% in recent years with the effective policies of participation banks on branching. At the end of 2019, the number of branches of participation banks reached 1,179 (including 3 overseas branches) and its share in the sector increased to 10.4%. When we look at the branch growth rates, it is clearly seen that participation banks are the group with the highest growth (Table 3). The compound annual growth rate (CAGR) is 10.5% for participation banks and 3.5% for deposit banks. Development & investment banks offer services with a limited branch network due to the fact that they are not allowed to accept deposits.

The number of branches of participation banks has always increased since 2005 except for 2016. The reason for the decline in this year is the cancellation of the operating permit of a participation bank in the sector. In deposit banks, the number of branches has been declining since 2015 (Figure 2). In this case, it can be said that the closure of some banks' branches due to the slowdown in the economy is effective.

Table3: Number of Branches and ATMs (BDDK, 2020)

	Participation Banks		**Deposit Money Banks**		**Development & Investment Banks**		**Sum**	
	Branch	**ATM**	**Branch**	**ATM**	**Branch**	**ATM**	**Branch**	**ATM**
2005	292	307	6.241	14.529	35	0	6.568	14.836
2006	356	380	6.904	16.133	42	0	7.302	16.513
2007	422	500	7.658	18.295	42	0	8.122	18.795
2008	536	679	8.724	21.274	44	0	9.304	21.953
2009	569	801	8.968	23.151	44	0	9.581	23.952
2010	607	924	9.419	26.680	40	0	10.066	27.604
2011	685	1.062	9.791	30.600	41	0	10.517	31.662
2012	829	1.335	10.191	33.374	41	0	11.061	34.709
2013	965	1.886	10.981	38.226	40	0	11.986	40.112
2014	990	2.026	11.180	41.642	40	0	12.210	43.668
2015	1.080	2.137	11.149	44.083	40	0	12.269	46.220
2016	959	1523	10749	44850	39	0	11.747	46.373
2017	1.032	1688	10503	45650	49	0	11.584	47.338
2018	1.122	1922	10397	46639	53	0	11.572	48.561
2019	1.179	2166	10135	47038	60	0	11.374	49.204
CAGR	**10,50%**	**15,00%**	**3,50%**	**8,80%**	**3,90%**	**0**	**4,00%**	**8,90%**

The share of participation banks in the banking sector in terms of the number of personnel increased from 4.1% in 2005 to 7.8% in 2019. While the number of personnel of participation banks increased by double digits in some periods in the last 15 years, a remarkable decrease was seen in 2016. The reason for this is the cancellation of the operating permit of a participation bank in the sector. Since 2017, the number of personnel has started to increase, although not as remarkable as in previous periods. The economic difficulties experienced in the country in recent years have caused some participation banks to reduce the number of their staff. However, when compared with deposit and development & investment banks facing the same problems, it can be seen that participation banks are in a more positive situation in the number of staff (Table 4). Newly established public participation banks have an impact on this positive development.

Table 4: Number of Personnel (BDDK, 2020)

	Participation Banks		**Deposit Money Banks**		**Development & Investment Banks**		**Sum**	
	Personnel	**Annual Increase %**	**Personnel**	**Annual Increase %**	**Personnel**	**Annual Increase %**	**Personnel**	**Annual Increase %**
2005	5.747		127.851		5.126		138.724	
2006	7.112	23,80	138.599	8,40	5.255	2,50	150.966	8,80
2007	9.187	29,20	153.212	10,50	5.361	2,00	167.760	11,10
2008	11.032	20,10	166.326	8,60	5.307	-1,00	182.665	8,90
2009	11.802	7,40	167.063	0,40	5340	0,60	184.205	0,80
2010	12.677	7,40	173.133	3,60	5.370	0,60	191.180	3,80
2011	13.851	9,30	176.579	2,00	4.841	-9,90	195.271	2,10
2012	15.356	10,90	181.197	2,60	4900	1,20	201.453	3,20
2013	16.763	9,20	192.219	6,10	5244	7,00	214.226	6,30
2014	16.280	-2,90	195.109	1,50	5523	5,30	216.912	1,30
2015	16.554	1,70	195.584	0,20	5366	-2,80	217.504	0,30
2016	14.465	-12,60	191084	-2,30	5337	-0,50	210.886	-3,00
2017	15.029	3,90	188012	-1,60	5239	-1,80	208.280	-1,20
2018	15.654	4,20	186669	-0,70	5392	2,90	207.715	-0,30
2019	16.040	2,50	183410	-1,70	5176	-4,00	204.626	-1,50
CAGR	**7,60%**		**2,60%**		**0,10%**		**2,80%**	

Participation banks have been growing rapidly since the day they were founded. Especially since the early 2000s, double-digit growth figures (excluding 2014) have been realized in total assets. While the asset size of participation banks was around TL 10 billion in 2005, this figure increased to TL 284 billion at the end of 2019. The total assets of the banking sector in Turkey are around TL 4.5 trillion in 2019. According to the annual composite average, the banking sector grew by 18.7%, deposit banks by 14.7%, participation banks by 27.1% and development & investment banks by 25.3% between 2005 and 2019 (Table 6). The growth trend of participation banks is remarkably above that of other group banks, and while its share in the total was 2.4% in 2005, it increased to 6.3% at the end of 2019. In 2019, participation banks again achieved a growth of 37.5%, well above other bank groups. Following this rapid growth, participation banks saw the highest sector share (6.3%) in the last 15 years. However, considering the potential in Turkey and the 15% target in 2025, this share is quite low.

Table5: Asset Size (millionTL) (BDDK, 2020)

	articipation Banks		***Deposit Money Banks***		***Development & Investment Banks***		***Sum***	
Years	***Active Magnitude***	***Annual Increase %***	***Active Magnitude***	***Annual Increase %***	***Active Magnitude***	***Annual Increase %***	***Active Magnitude***	***Annual Increase %***

2005	*9.945*		*384.097*		*12.867*		*406.909*	
2006	*13.752*	*38,30*	*470.635*	*22,50*	*15.345*	*19,30*	*499.731*	*22,80*
2007	*19.445*	*41,40*	*543.272*	*15,40*	*18.888*	*23,10*	*581.606*	*16,40*
2008	*25.770*	*32,50*	*683.823*	*25,90*	*22.943*	*21,50*	*732.536*	*26,00*
2009	*33.628*	*30,50*	*773.357*	*13,10*	*27029*	*17,80*	*834.014*	*13,90*
2010	*43.339*	*28,90*	*932.371*	*20,60*	*30.958*	*14,50*	*1.006.667*	*20,70*
2011	*56.148*	*29,60*	*1.119.911*	*20,10*	*41.636*	*34,50*	*1.217.695*	*21,00*
2012	*70.279*	*25,20*	*1.247.653*	*11,40*	*52.758*	*26,70*	*1.370.690*	*12,60*
2013	*96.075*	*36,70*	*1.566.190*	*25,50*	*70.136*	*32,90*	*1.732.401*	*26,40*
2014	*104.319*	*8,60*	*1.805.438*	*15,30*	*84.571*	*20,60*	*1.994.329*	*15,10*
2015	*120.183*	*15,20*	*2.130.601*	*18,00*	*106.649*	*26,10*	*2.357.432*	*18,20*
2016	*13.284*	*10,60*	*2.455.366*	*15,20*	*142.797*	*33,90*	*2.731.037*	*15,80*
2017	*160.136*	*20,50*	*2.922.704*	*19,00*	*175.002*	*22,60*	*3.257.842*	*19,30*
2018	*206.931*	*29,20*	*3.403.305*	*16,40*	*257.190*	*47,00*	*3.868.426*	*18,70*
2019	*284.450*	*37,50*	*3.904.923*	*14,70*	*302.335*	*17,60*	*4.491.708*	*16,10*
CAGR	***27,10%***		***18,00%***		***25,30%***		***18,70%***	

4. CONCLUSION

Private Finance Institutions (EFC), which have been seen in the world since 1960, have gradually developed their place in developing economies.As a result of the fact that interest is forbidden according to Islamic belief, the transfer of the savings of the Muslim population to this different employee system has started to increase over time. It has received so much response in the financial system that private financial institutions have been established even in countries where the Muslim population is not concentrated as of today. In many parts of the world, private financial institutions have made great progress as a result of being adequately received by Muslims.

In Turkey, Private Financial Institutions started to lay their foundations with the radical economic developments made in 1983. It was first established in 1985 and became known to the public. The people in Turkey, where 98% of the population is Muslim, did not prefer it much because the banks worked with the interest rate system. He did not work with the banking system unless he had to. Only those engaged in compulsory trade were working with banks. Citizens who had savings were using the banking system in different areas such as gold and foreign exchange. With the establishment of private financial institutions in 1985, they gradually began to meet this new interest-free system. As this system, which has interest-free working principles, is recognized and new ones are opened, the Turkish society has started to find more response. The names of these institutions, which were also changed in 2005, have now started to be referred to as Participation Banks. With the establishment of 3 more participation banks by the public in 2015, their number has become 6 in Turkey today. Their place in the financial system has also started to increase day by day. Their place in the economy has also increased significantly in recent years. Many services offered by other banks are now offered by participation banks to their customers. For this reason, they have started to be highly preferred by the people. In the future, participation banks are expected to have an even greater place in the financial sector in these developments. As a result of their variety of services and developing economic indicators, participation banks will make great progress in the world and Turkey in the coming time.

References

[1] Afşar, M. (2006), Finansal Sistem ve İşleyişi [Financial System and its Functioning], Eskişehir: Gülen Ofset.
[2] Bayindir, A. (2007), Ticaret ve Faiz, Süleymaniye Vakfı Yayınları, 1.Baskı, İstanbul.
[3] Şimşek, M.H. (2020). Türkiye'de Katılım Bankacılığının Gelişimi ve 2025 Vizyonu. Yüksek Lisans Tezi. Kahraman [4] Maraş Sütcü İmam Üniversitesi, Sosyal Bilimler Enstitüsü, İktisat Ana Bilim Dalı.
[4] Kevser, M. (2020). Türkiye'de Katilim Bankaciliğinin Gelişimi üzerine bir değerlendirme: 2015-2019 dönemi analizi . Avrasya Sosyal ve Ekonomi Araştırmaları Dergisi , 7 (6) , 116-127.
[5] Kartal, M.T. & Demir, C. H. (2017). Türkiye'de Katılım Bankacılığının Sektör Payı Hedefi Üzerine Bir Analiz, Route Educational and Social Science Journal Volume 4(3) ss. 33-58.
[6] Özcan, M. E. ve Hazıroğlu, T. (2000). "Bankacılıkta Yeni Bir Boyut: Katılım Bankacılığı". Bereket Dergisi, Yıl: 3, Sayı: 9.
[7] Özsoy, İ. (1994), Faiz ve Problemleri. İzmir: Nil.
[8] Özulucan, A. ve Özdemir S. F. (2010), Katılım Bankacılığı, Türkmen Kitabevi, İstanbul.
[9] Takan, M. (2001). Bankacılık Teori Uygulama ve Yönetim, Nobel Kitapevi, Adana.
[10] Terzi, A. (2013). Katılım Bankacılığı: Kitaba Uymak mı, Kitabına Uydurmak mı? Karadeniz Sosyal Bilimler Dergisi, 5(9).
[11] Tunç, H. (2000). "Soru ve Cevaplarla ÖFK'lar" Bereket Dergisi, , Yıl: 3, Sayı:10, s.13.
[12] Zerka, M. A. ve En-Neccar A. (2009). İslam Düşüncesinde Ekonomi Banka ve Sigorta. Çev. Hayrettin Karaman, İz Yayıncılık,
[13] BDDK (2020). https://www.bddk.org.tr/.

The Problem of Unemployment and Employment Polıcıes in Turkey

Alper GEDİK[a*], Ali ANTEPLİ[b]

[a] Selcuk University, Beyşehir AA Faculty of Business Administration, Department of Business Administration, Konya, Türkiye, alpergedik@selcuk.edu.tr
[b] Selçuk University, Beyşehir AA Faculty of Business Administration, Department of International Trade and Management, Konya, Türkiye, ali.antepli@selcuk.edu.tr

Abstract

Unemployment varies according to the economic situation of the countries. However, although it varies, it is a common problem in most countries. Minimizing or eliminating this problem is the common goal of the countries. Because unemployment causes great damage to the country in terms of economy as well as the source of many social problems. Unemployment is one of the main problems of Turkey as well as other countries. For this reason, within the economic policies implemented in Turkey, the solution of unemployment and employment problem should be done very well. This study is of great importance in terms of solving the causes of unemployment and the steps to be taken afterwards. In this study, the problem of unemployment in Turkey, the extent of unemployment, the source of the unemployment problem, the studies and policies to reach a solution were examined. Today, unemployment and employment are the main problems of Turkey as well as many countries. In the current period, the state of employment and the size of unemployment are important indicators for the development status of countries. Therefore, the resolution of unemployment, which has reached very serious dimensions in Turkey, is of great importance in terms of development. In order to solve the unemployment problem, its causes must first be understood. If the causes are resolved, the right policies will be developed and the unemployment problem will be resolved.

Keywords: Employment; Employment Policies; Unemployment

1. INTRODUCTION

Unemployment varies according to the economic situation of the countries. However, although it varies, it is a common problem of most countries. Minimizing or eliminating this problem is the common goal of countries. Because unemployment is the source of many problems in social terms as well as causing great damage to the country in economic terms.

It is very important for countries to cope with unemployment for economic progress. When the unemployed are brought to the economy in line with their skills and education, great benefits will be provided to the economy. The rapidly increasing young and unemployed generation should be encouraged and supported in production. The producing generation will pave the way for a solution to both its own unemployment and employment.

In social terms, unemployment brings along many problems. Unemployment distracts people from social life and makes them asocial. People who move away from the environment due to the pressure in society and whose self-confidence is broken tend to crime. Unemployment does not only cause economic problems. It affects economic well-being as well as social welfare. The unhappiness of people and the fact that they begin to be prone to crime will create an uneasy environment. Therefore, even those who have jobs will be unemployed and will definitely be able to disturb them. For this reason, countries are looking for effective policies to cope with unemployment.

* Corresponding author.

The problem of unemployment is one of the main problems of Turkey as well as other countries. For this reason, within the economic policies implemented by Turkey, the solution of the problem of unemployment and employment should be done very well. The main failure of the labor market in Turkey lies in the rapid increase of the population. In order to solve a problem, it is of great importance to first solve the problem and to go to the source. If we do not know why the problem arises, it will be difficult for us to solve it. The biggest reason why unemployment cannot be solved in Turkey stems from not getting to the core of the problem and not being able to solve it.

In this study, it is aimed to discuss the causes of unemployment in Turkey and the results of the economic policies implemented to solve the unemployment problem. In addition, it is aimed to determine the reasons why the unemployment problem cannot be solved.

2. UNEMPLOYMENT PROBLEM IN TURKEY

2.1. What is Unemployment?

Although the definitions of unemployment are very diverse in the literature, many definitions are similar to each other. In general, when unemployment is defined, it refers to people who want to work on a certain wage, on a certain date and cannot work. From this point of view, it can be said that the important issue to be unemployed is to have the desire to look for a job and work. However, in addition to job search in the literature, the concept of being able to do business in the explanation of employment can also be used as a condition for unemployment. From this point of view, we can define unemployment as the inability to work by including people who have a desire to look for a job and who are also able to do business.

When unemployment is examined in Turkey in particular, it is mostly seen in young people. The main reason for this is that young and new graduates are inexperienced (Adıgüzel, 2021). The official institution that conducts data studies on unemployment in Turkey is the Turkish Statistical Institute. In TURKSTAT data, people who are in a state of job search for unemployment in a certain period and have not been able to start work are used.

2.2. Types of Unemployment

Unemployment may vary in terms of its structure. These differences in the structure of unemployment may be due to differences such as age, gender, education status. In addition, geographical distribution may vary according to occupations and duration, or according to changes in the collective state of the world. These differences in unemployment have led to the formation of types of unemployment. It is not always possible to say why a person is unemployed, but it is usually possible to have an idea of the important reasons that leave many people unemployed.

2.2.1. Open Unemployment

It is the case that a person does not have a job to make money or to make a living.

2.2.2. Hidden Unemployment

The fact that a person is not ostensibly unemployed but actually makes no contribution to production is called "hidden unemployment". Hidden unemployment shows a different characteristic among other types of unemployment. Although it is a type of unemployment, it explains a special situation of unemployment (Bekiroğlu, 2010).

2.2.3. Temporary Unemployment

Incidental unemployment can be defined as the fact that employees are unemployed after leaving their jobs voluntarily until they get a job they love. In this type of unemployment, in order to be able to work handily in better conditions, employees leave their jobs and become temporarily unemployed. Incidental unemployment can occur even when the economy is in full employment balance (Bozdağlıoğlu, 2008).

2.2.4. Seasonal Unemployment

In some economies, the seasons create big changes in the business world. This change is usually regionally effective. Although this change is generally encountered in tourism, agriculture and construction, the affected areas may vary. For example, in Beyşehir district of Konya province, the beet harvest period starts in September and sometimes lasts until November. In this one-and-a-half-month period, the need for employment in the district increases considerably, but as of the end of the period, these people remain unemployed.

Although the existing work is carried out in jobs that require intensive employment, seasonal unemployment is called seasonal unemployment when this intensive labor force leaves the labor market at the end of the task. The same kind of unemployment is frequently encountered in our tourism regions, and in these regions, unemployment is minimized in summer and increases in winter.

2.2.5. Technological Unemployment

The impact of technology on unemployment has been a topic of debate for many years. Before moving on to the views of optimistic or pessimistic ministers on the effect of technology on unemployment, it should be said that if a country wants to maintain its economic existence in today's world, it must definitely develop technologically.

"Those who are pessimistic about the effect of technology on unemployment argue, in line with Marx's views, that new technologies will not increase unemployment to the extent that they reduce it. According to this view, not only is capital replacing labor, but also unskilled labor is being replaced by skilled labor. While the employment opportunities of engineers, scientists, technical personnel and computer specialists are increasing, people whose qualifications are outdated cannot find new employment opportunities. A tiny chip attached to the machine can perform calculations made by dozens of people in a short time and without errors. " (Yıldız,2014)

"Those who are optimistic about the effect of technology on unemployment argue that technology creates unemployment at first, but then with the emergence of new job opportunities in parallel with the developing technology, employment areas that we call secondary effects are formed. Those who hold this view say that companies cannot survive when they cannot keep up with technology, which will adversely affect employment." (Yıldız,2014).

2.2.6. Persistent Recession Unemployment

The reason for this unemployment is the stagnation in the economic structure (Yıldız, 2014). Especially in developed countries, large masses may be unemployed as a result of the recession of the economy due to various reasons (Yıldız, 2014). The cheaper and more profitable production of competing countries leads to a decline in productivity and also to economic decline, creating permanent unemployment.

The most important reasons for persistent stagnation unemployment in developed countries are the lack of courageous entrepreneurship after certain economic periods, resulting from the aimlessness seen in economic targets and the decrease in the proportion of young population as a result of population growth being too slow. Along with these conditions, the difficulty of finding a job and the lack of income caused by mass unemployment make it inevitable to pile up in big cities and social explosions.

2.3. Measuring Unemployment in Turkey

Measurement of unemployment is of great importance in order to understand the causes of unemployment and to produce and implement appropriate solution policies. The measurement of unemployment varies between countries according to the state of development.

The infrastructure of the statistical information required to monitor the labor market consists of data on economically active population, employment, underemployment and unemployment. These data serve as a source for both employment and other economic policies to be directed. The main data sources covering the entire labor force in Turkey are the Address Based Population Registration System, TUIK household labor force surveys, Turkish Employment Agency (İŞKUR) publications and the State Planning Organization (DPT).

The part of the total population in a country over the age of 15, except for those residing in places such as barracks, prisons and hospitals, is called the "non-institutional civilian population" (Bekiroğlu, 2010).

Labor Force Participation Rate = (Labor Force / Non-Institutional Civilian Population) x 100.

Unemployment Rate = (Unemployed / Labor Force) x 100.

Employment Rate = (Employed / Non-Institutional Civilian Population) x 100.

Unemployment rates do not fully reflect the reality for two reasons. As the first reason, we can say that in cases where unemployment rates are high and therefore it is difficult to find a job, some people stop looking for a job with the thought and despair that they will not be able to find a job. These people are called "discouraged workers." If these people are taken into account, the unemployment rate will be higher than calculated. As a second reason, we can cite the example of some of the employed people being employed "part-time". When this situation, which is defined as underemployment, is taken into account, the unemployment rate will again be higher than calculated.

2.4. Dimensions of Unemployment in Turkey

The population in Turkey is increasing rapidly. Since sufficient job opportunities cannot be created for this population, unemployment in Turkey is gradually increasing. To summarize the reason for unemployment in Turkey, it can be said that the balance between labor supply and demand, which is increasing due to urbanization and the rapid increase in population, cannot be established. The fact that industrialization has not increased sufficiently supports this situation.

Table 1:2021 Unemployment

	Aralık 2021			Bir önceki aya göre fark			Bir önceki yılın aynı ayına göre fark		
	Toplam	Erkek	Kadın	Toplam	Erkek	Kadın	Toplam	Erkek	Kadın
(Bin kişi)									
Nüfus	64 173	31 748	32 425	84	39	45	1 033	479	554
İşgücü	33 935	22 749	11 186	238	137	100	2 929	1 598	1 331
İstihdam	30 141	20 501	9 640	236	94	142	3 088	1 921	1 167
İşsiz	3 794	2 248	1 546	2	44	-42	-159	-322	164
İşgücüne dahil olmayanlar	30 238	8 999	21 239	-153	-98	-55	-1 896	-1 120	-776
(%)									
İşgücüne katılma oranı	52,9	71,7	34,5	0,3	0,4	0,3	3,8	4,1	3,6
İstihdam oranı	47,0	64,6	29,7	0,3	0,2	0,4	4,2	5,2	3,1
İşsizlik oranı	11,2	9,9	13,8	-0,1	0,2	-0,5	-1,5	-2,3	-0,2
Tarım dışı işsizlik oranı	12,8	10,9	16,9	-0,3	-0,1	-0,8	-2,1	-2,9	-0,5

Tablodaki rakamlar yuvarlamadan dolayı toplamı vermeyebilir.

It is not possible to reach clear and precise information that determines the amount of unemployed and unemployment rate in Turkey. One of the leading reasons for this is the failure to effectively implement unemployment insurance in developed Western countries. For this reason, it is often discussed that the figures related to unemployment in Turkey do not fully reflect the reality (Bozdağlıoğlu, 2008).

Figure 1:2019-2021 Graphics

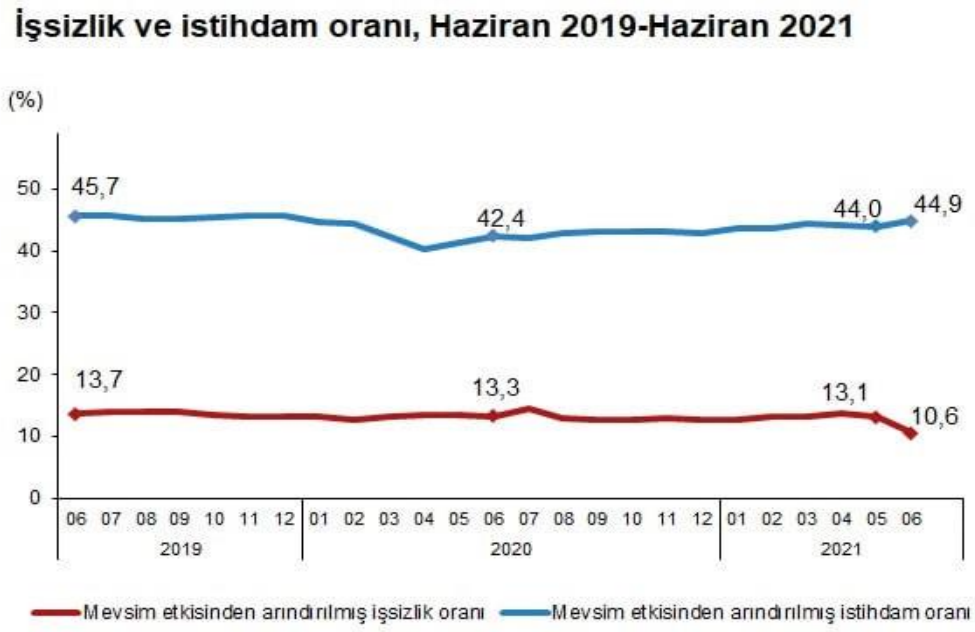


Figure 2: 2019-2021 Ratio

2.5. Problems Caused by Unemployment

It is well known that unemployment has an economic cost. In addition, it leads to two other problems that are too important to ignore. These are psychological and social problems. Although these problems are ignored, the economic damage is compensated in some way, but social and psychological problems can leave irreversible traces.

2.5.1. Economic Problems

When people are unemployed, it means that their existing skills cannot be used and they are lost. Especially the young unemployed cannot use the ore in them and spend their most productive years with anxiety. In fact, if he has to get a job that he is not talented in, he has a job because he will be inefficient in that job and although it seems

to contribute to the economy, he is actually not useful. The increase in the number of people experiencing individual economic problems will also regress the economy of the state.

2.5.2. Social Problems

The fact that unemployment has become permanent and chronic leads to future anxiety, especially in young people. Students who study school are worried about not being able to find a job when they graduate. Even if they find a job, they are worried about not being able to find a job related to their field. When these concerns become continuous, they create a mental breakdown in people (Akgün, 2019).

People become nervous, unable to control anger, prone to crime. This threatens the social order.

2.5.3. Psychological problems

Unemployment brings depression with it. When people are unemployed, they may experience severe depression that leads to economic problems and suicide. In addition, they experience many psychological problems such as not trusting the order and feeling inadequate.

It can be said that the COVID-19 virus, which entered our lives with 2020 and left many material and spiritual traces all over the world, also had an impact on the psychological effect of unemployment. In the pandemic, the fact that people do not leave the house and do not enter the environments where they will relieve their stress has also increased the psychological pressure. COVID-19, which caused many people to suffer sectorally due to the pandemic, has harmed people both directly in terms of unemployment and psychologically (Tatar, 2022).

3. EMPLOYMENT POLICIES FOR THE SOLUTION OF THE UNEMPLOYMENT PROBLEM

3.1. What is Employment?

Employment is the labor force employed in a certain period in a country. Employment and unemployment are two concepts that are generally inversely proportional. If there is enough employment in a country, people will be less likely to be unemployed. The solution to unemployment is to increase employment.

Full employment is the use of all the factors of production available in a country. Underemployment is defined as the situation where the labor force is not evaluated in sufficient amounts.

2.2.Employment Data in Turkey

According to the information received from the Turkish Statistical Institute (TurkStat), employment data in Turkey in recent years are as follows.

Table 2:2021 Employment Rate

	Haziran 2021			Bir önceki aya göre fark			Bir önceki yılın aynı ayına göre fark		
	Toplam	Erkek	Kadın	Toplam	Erkek	Kadın	Toplam	Erkek	Kadın
Nüfus	63 659	31 512	32 147	87	40	47	1 134	586	548
İşgücü	31 984	21 780	10 204	-222	-344	122	1 443	948	495
İstihdam	28 586	19 824	8 761	602	383	218	2 105	1 564	540
İşsiz	3 399	1 956	1 443	-823	-727	-96	-660	-616	-44
İşgücüne dahil olmayanlar	31 675	9 732	21 943	309	384	-75	-310	-362	53
İşgücüne katılma oranı (%)	50,2	69,1	31,7	-0,5	-1,2	0,3	1,4	1,7	1,0
İstihdam oranı (%)	44,9	62,9	27,3	0,9	1,1	0,7	2,5	3,9	1,3
İşsizlik oranı (%)	10,6	9,0	14,1	-2,5	-3,1	-1,2	-2,7	-3,3	-1,2
Tarım dışı işsizlik oranı (%)	12,3	10,1	17,5	-2,7	-3,5	-0,8	-3,2	-4,0	-1,4

Tablodaki rakamlar yuvarlamadan dolayı toplamı vermeyebilir.

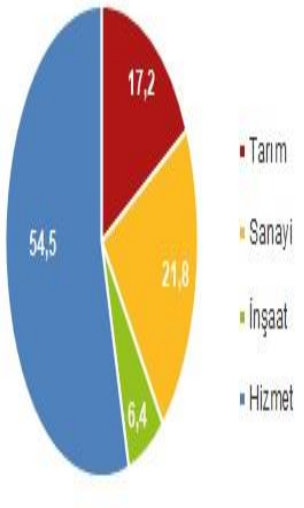
Table 3:2021 Sectoral Distribution

İstihdamın sektörel dağılımı, 15+ yaş, (Bin kişi), Haziran 2021

	Haziran 2021			Bir önceki aya göre fark			Bir önceki yılın aynı ayına göre fark		
	Toplam	Erkek	Kadın	Toplam	Erkek	Kadın	Toplam	Erkek	Kadın
Toplam	28 586	19 824	8 761	602	383	218	2 105	1 564	540
Tarım	4 921	2 904	2 017	163	4	159	106	29	77
Sanayi	6 239	4 744	1 495	296	256	40	818	592	226
İnşaat	1 844	1 765	79	8	7	1	258	254	4
Hizmet	15 583	10 412	5 171	136	117	19	924	691	233

Tablodaki rakamlar yuvarlamadan dolayı toplamı vermeyebilir.

İstihdamın sektörel dağılımı (%), Haziran 2021



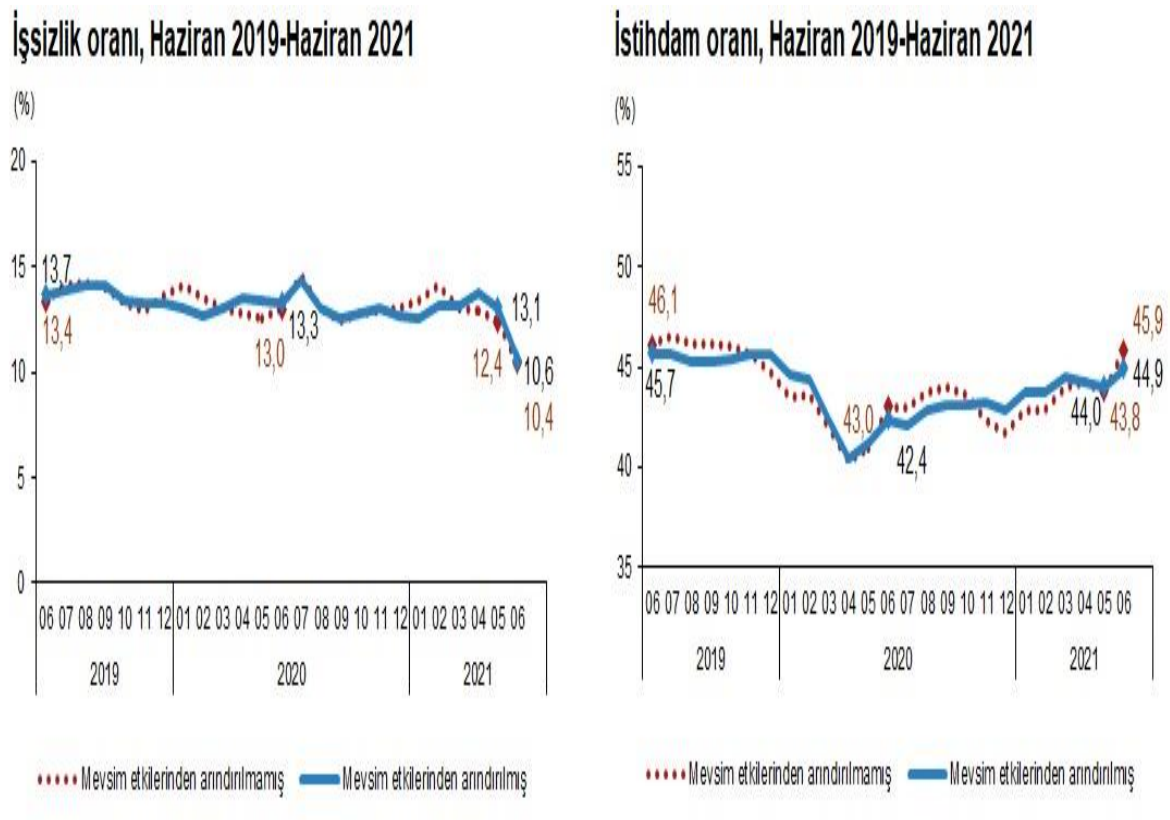


Figure 3:2019-2021 Employment Chart

3.2. Employment Policies Implemented in Turkey

Many employment policies are being tried to eliminate unemployment and eliminate its effects. Policies such as income support are passive employment policies. Policies such as preparing people for work and making them effective through trainings are active employment policies (GüçlüYavaş, 2020).

The Organisation for Economic Co-operation and Development (OECD) has rounded up its employment policies under 7 headings. These are; public twinning and consultancy services, vocational training, subsidized employment (subsidy for the private sector, assistance to those who start their own businesses, direct employment in the public sector, etc.), policies for young people, policies for the disabled, unemployment insurance, early retirement (Ay, 2012).

Certain policies are being implemented to solve the unemployment problem and increase employment. One of them is the matching and consultancy service. This service is the combination and matching of labor supply and demand (Bayrakdar, 2019). İşkur is the pioneer of this work in Turkey.

The state sometimes directly and sometimes indirectly gives wage support to the people. This is one of the employment policies. As an example of direct giving, we can give the incentive fees it has given to agriculture. At the same time, we can include the grants it gives to new business start-ups in this policy. As for the help he has done indirectly, we can give tax breaks as an example.

It is also one of the employment policies of the state to give direct employment to some people who are difficult to find a job in the labor market. Prisoners and people with disabilities can be cited as examples of this employed group.

Another policy is vocational training programs, which are among the active employment policies and are seen as the most promising for the future. Thanks to these programs, training is given to people who cannot enter the labor market and efficiency is gained in certain jobs. These trainings can be provided by state institutions as well as private employment institutions. It is a good opportunity to become equipped for those who are inadequate in the labor market and who are at risk of leaving the market. İşkur is also leading these programs. Examples of programs include courses such as English, Cooking, and Computers. It is an important program both in terms of acquiring a profession and becoming equipped. It also leads the people who receive the training of the business to work more efficiently.

İşkur regulates employment policies in Turkey. The aim of the policies implemented is to protect existing employment and reduce unemployment. "In accordance with the labor market analyzes made in this context, the professions needed in each province are determined and annual labor force training plans are prepared. These plans are created by the Provincial Directorates of the Labor and Employment Agency and prepared for 81 provinces. With the programs prepared by the institution, job-vocational consultancy services are provided to the registered unemployed and they are provided with the opportunity to participate in the course-program that is suitable for them. Within the scope of İŞKUR's employment policy implementation activities, vocational training courses, on-the-job training programs, entrepreneurship training programs, and programs for the benefit of society are organized. In addition, in addition to these programs, vocational trainings for employees, protected workplace project, support for the disabled and ex-convicts to start a business, and projects for the disabled are carried out." (Bayrakdar,2019).

Table 4:2020 İşkur Employment

TABLE: OPEN JOBS AND PLACEMENTS (BY PROVINCE)

PROVINCES	Open Business (*)			Work Placement								
	Public	Special	Sum	Public			Special			Sum		
				Male	Woman	Sum	Male	Woman	Sum	Male	Woman	Sum
ADANA	268	38.531	38.799	204	118	322	22.288	7.700	29.988	22.492	7.818	30.310
ADIYAMAN	36	8.932	8.968	4	0	4	2.847	1.982	4.829	2.851	1.982	4.833
AFYONKARAHİSAR	271	14.395	14.666	209	28	237	5.770	2.584	8.354	5.979	2.612	8.591
AĞRI	13	5.496	5.509	10	1	11	2.464	741	3.205	2.474	742	3.216
AKSARAY	40	6.875	6.915	32	8	40	3.943	1.252	5.195	3.975	1.260	5.235
AMASYA	5	4.534	4.539	30	8	38	2.149	1.893	4.042	2.179	1.901	4.080
ANKARA	19.696	109.443	129.139	14.718	7.123	21.841	21.993	11.015	33.008	36.711	18.138	54.849
ANTALYA	292	27.110	27.402	85	36	121	9.069	6.854	15.923	9.154	6.890	16.044
ARDAHAN	3	880	883	40	19	59	486	309	795	526	328	854
ARTVİN	205	1.465	1.670	23	2	25	1.062	478	1.540	1.085	480	1.565
AYDIN	129	24.384	24.513	106	54	160	19.335	9.143	28.478	19.441	9.197	28.638
BALIKESİR	577	22.290	22.867	1.391	234	1.625	10.009	8.538	18.547	11.400	8.772	20.172
BARTIN	20	4.183	4.203	59	10	69	1.783	1.016	2.799	1.842	1.026	2.868
BATMAN	30	4.287	4.317	3	0	3	2.848	2.396	5.244	2.851	2.396	5.247
BAYBURT	2	707	709	7	1	8	428	269	697	435	270	705
BİLECİK	32	6.650	6.682	25	2	27	3.333	1.441	4.774	3.358	1.443	4.801
BİNGÖL	9	3.663	3.672	0	0	0	1.931	1.421	3.352	1.931	1.421	3.352
BİTLİS	0	1.994	1.994	1	0	1	1.260	763	2.023	1.261	763	2.024
BOLU	53	7.369	7.422	11	4	15	4.150	2.626	6.776	4.161	2.630	6.791
BURDUR	172	3.989	4.161	111	53	164	2.070	693	2.763	2.181	746	2.927

BURSA	228	61.392	61.620	137	59	196	20.200	13.899	34.099	20.337	13.958	34.295
ÇANAKKALE	333	10.043	10.376	157	128	285	4.904	2.093	6.997	5.061	2.221	7.282
ÇANKIRI	42	4.357	4.399	0	4	4	3.056	1.163	4.219	3.056	1.167	4.223
ÇORUM	61	6.458	6.519	82	13	95	3.924	1.728	5.652	4.006	1.741	5.747
DENİZLİ	256	18.094	18.350	108	29	137	4.791	3.310	8.101	4.899	3.339	8.238
DİYARBAKIR	90	11.693	11.783	41	10	51	6.146	2.893	9.039	6.187	2.903	9.090
DÜZCE	105	8.685	8.790	60	42	102	2.470	2.196	4.666	2.530	2.238	4.768
EDİRNE	254	4.024	4.278	20	4	24	1.563	1.611	3.174	1.583	1.615	3.198
ELAZIĞ	290	11.190	11.480	125	34	159	6.855	1.259	8.114	6.980	1.293	8.273
ERZİNCAN	36	4.160	4.196	100	12	112	3.061	953	4.014	3.161	965	4.126
ERZURUM	463	8.527	8.990	439	120	559	5.656	1.726	7.382	6.095	1.846	7.941
ESKİŞEHİR	272	16.078	16.350	229	97	326	7.630	4.822	12.452	7.859	4.919	12.778
GAZİANTEP	122	38.803	38.925	72	15	87	14.280	2.846	17.126	14.352	2.861	17.213
GİRESUN	34	3.275	3.309	12	11	23	1.481	1.569	3.050	1.493	1.580	3.073
GÜMÜŞHANE	11	1.169	1.180	11	6	17	726	295	1.021	737	301	1.038
HAKKARİ	15	698	713	4	6	10	272	120	392	276	126	402
HATAY	136	9.758	9.894	108	38	146	4.468	1.188	5.656	4.576	1.226	5.802
IĞDIR	8	1.269	1.277	11	6	17	968	549	1.517	979	555	1.534
ISPARTA	320	5.620	5.940	116	86	202	2.202	1.474	3.676	2.318	1.560	3.878
İSTANBUL	2.540	264.590	267.130	1.103	353	1.456	62.550	37.087	99.637	63.653	37.440	101.093
İZMİR	717	75.463	76.180	482	231	713	21.755	19.455	41.210	22.237	19.686	41.923
KAHRAMANMARAŞ	219	16.769	16.988	74	74	148	8.517	2.334	10.851	8.591	2.408	10.999
KARABÜK	25	4.516	4.541	165	9	174	2.230	891	3.121	2.395	900	3.295
KARAMAN	71	6.719	6.790	156	88	244	2.249	1.937	4.186	2.405	2.025	4.430
KARS	65	1.608	1.673	40	22	62	880	456	1.336	920	478	1.398
KASTAMONU	59	6.038	6.097	37	6	43	2.638	1.734	4.372	2.675	1.740	4.415
KAYSERİ	108	29.162	29.270	116	22	138	17.773	3.896	21.669	17.889	3.918	21.807
KIRIKKALE	135	4.266	4.401	36	4	40	2.696	1.315	4.011	2.732	1.319	4.051
KIRKLARELİ	53	7.208	7.261	35	7	42	2.060	2.113	4.173	2.095	2.120	4.215
KIRŞEHİR	34	3.171	3.205	9	1	10	1.793	464	2.257	1.802	465	2.267
KİLİS	0	2.011	2.011	16	9	25	907	279	1.186	923	288	1.211
KOCAELİ	208	67.847	68.055	87	95	182	32.328	12.377	44.705	32.415	12.472	44.887
KONYA	1.365	42.276	43.641	855	188	1.043	28.017	5.776	33.793	28.872	5.964	34.836
KÜTAHYA	30	8.755	8.785	24	0	24	4.070	2.016	6.086	4.094	2.016	6.110
MALATYA	391	15.987	16.378	55	21	76	7.803	3.579	11.382	7.858	3.600	11.458
MANİSA	125	30.576	30.701	63	69	132	7.855	7.395	15.250	7.918	7.464	15.382
MARDİN	15	5.885	5.900	4	6	10	1.758	1.608	3.366	1.762	1.614	3.376

MERSİN	148	24.994	25.142	76	50	126	13.282	6.975	20.257	13.358	7.025	20.383
MUĞLA	118	15.494	15.612	84	39	123	10.783	5.251	16.034	10.867	5.290	16.157
MUŞ	11	6.393	6.404	27	5	32	3.681	1.362	5.043	3.708	1.367	5.075
NEVŞEHİR	78	4.249	4.327	64	9	73	2.015	624	2.639	2.079	633	2.712
NİĞDE	37	5.090	5.127	25	2	27	2.648	1.009	3.657	2.673	1.011	3.684
ORDU	41	10.375	10.416	145	28	173	3.659	3.557	7.216	3.804	3.585	7.389
OSMANİYE	59	8.031	8.090	0	0	0	4.656	1.948	6.604	4.656	1.948	6.604
RİZE	742	5.542	6.284	639	19	658	3.092	1.032	4.124	3.731	1.051	4.782
SAKARYA	35	30.041	30.076	42	4	46	18.046	6.153	24.199	18.088	6.157	24.245
SAMSUN	178	21.001	21.179	392	65	457	12.306	8.019	20.325	12.698	8.084	20.782
SİİRT	85	3.790	3.875	19	1	20	2.388	586	2.974	2.407	587	2.994
SİNOP	37	2.753	2.790	17	4	21	1.895	1.287	3.182	1.912	1.291	3.203
SİVAS	248	6.704	6.952	123	140	263	3.558	1.253	4.811	3.681	1.393	5.074
ŞANLIURFA	251	12.439	12.690	101	23	124	5.030	3.488	8.518	5.131	3.511	8.642
ŞIRNAK	20	5.402	5.422	18	4	22	4.047	934	4.981	4.065	938	5.003
TEKİRDAĞ	155	34.788	34.943	63	38	101	12.886	8.053	20.939	12.949	8.091	21.040
TOKAT	269	8.029	8.298	35	1	36	3.658	3.101	6.759	3.693	3.102	6.795
TRABZON	290	10.957	11.247	196	73	269	4.463	2.656	7.119	4.659	2.729	7.388
TUNCELİ	5	1.468	1.473	4	1	5	767	188	955	771	189	960
UŞAK	0	10.812	10.812	21	7	28	5.260	2.574	7.834	5.281	2.581	7.862
VAN	91	7.325	7.416	33	38	71	3.643	1.808	5.451	3.676	1.846	5.522
YALOVA	50	7.016	7.066	36	14	50	2.453	928	3.381	2.489	942	3.431
YOZGAT	103	8.696	8.799	65	46	111	6.038	1.758	7.796	6.103	1.804	7.907
ZONGULDAK	159	5.136	5.295	465	0	465	2.069	1.422	3.491	2.534	1.422	3.956
TOPLAM	**34.299**	**1.371.842**	**1.406.141**	**24.948**	**10.237**	**35.185**	**554.073**	**279.486**	**833.559**	**579.021**	**289.723**	**868.744**

(*) Since the gender detail was removed in 2006, open job statistics cannot be produced in this detail as of the said date.

4. CONCLUSION AND RECOMMENDATION

In this study, the problem of unemployment in Turkey was discussed and the policies implemented for its solution were examined. Studies show that unemployment causes great harm to a country in every aspect. The studies carried out for its solution are insufficient. Because in order to solve a problem, it is necessary to analyze the problem well.

Some points are ignored when determining unemployment figures in our country. For this reason, exactly accurate data cannot be obtained. For example, although a group of people who are unemployed are all considered unemployed, they are not in a homogeneous distribution. Especially what we call Generation Z is a community that has a lot of difference among the current young generation. Many factors such as their education, family, language, religious race, physical structure affect people related to their job dreams. Or a person who does not appear to be unemployed, who works in a job that he is not competent due to livelihood concerns, has a great impact on the economy because it affects productivity, even if it is not reflected in the data. In terms of the quality of the work done, the job seeker should consider the jobs that the group is competent for. In this regard, the Vocational Training Programs carried out by İşkur are of great importance. Studies need to be increased.

Another reason for unemployment in Turkey is the high cost of labor. The inadequacy of practices that reduce employment taxes on labor costs, on the other hand, the existence of a highly flexible labor market in Turkey that will prevent the reduction of wages is remarkable. Therefore, in our country, where the share of labor in added value has declined and changes in income distribution in favor of capital have been experienced, the suppression of wages can lead to the suppression of both production and investments, actually causing unemployment (Ay, 2012).

A multifaceted examination of unemployment and employment policies will be an important step towards solving this problem. Unemployed people need to be encouraged and encouraged to start a business instead of aiming to work as workers in the market. In particular, encouraging inexperienced unemployed people who have just graduated to start a business is of great importance for the solution of the problem as it will open the door of employment for others. If the unemployed (especially the young unemployed) are encouraged to start new businesses and open employment areas, it will be a great support to the state. High costs spent on employment will decrease. The fact that the economy becomes more active will also benefit growth as it will stimulate the market.

As a result, employment policies are being carefully pursued to eliminate unemployment in Turkey. The state attaches importance to this issue and allocates a budget, but it is insufficient in practice. If the policies implemented are developed and the studies are carried out in a more individual approach and the differences of the societies are made, this problem will be eliminated to a great extent.

References

[1] Erişim tarihi, 15 Şubat 2022. Erişim adresi, https://www.iskur.gov.tr/kurumsal-bilgi/istatistikler/

[2] Erişim tarihi, 15 Şubat 2022. Erişim adresi, https://data.tuik.gov.tr/Bulten/Index?p=Isgucu-Istatistikleri-Haziran-2021-37482#:~:text=T%C3%BCrkiye%20genelinde%2015%20ve%20daha,%10%2C6%20seviyesinde%20ger%C3%A7ekle%C5%9Fti.

[3] Erişim tarihi, 15 Şubat 2022. Erişim adresi, https://data.tuik.gov.tr/Bulten/Index?p=Isgucu-Istatistikleri-Aralik-2021-45642

[4] Adıgüzel M, 2021. Türkiye'de genç işsizliği etkileyen faktörler. Harran Üniversitesi İİBF Dergisi, 5, 100-129.

[5] Akgün M, 2019. Türkiye'de genç işsizlik sorunu ve bu sorunun çözümüne yönelik istihdam politikaları. Yüksek Lisans Tezi, Maltepe Üniversitesi Sosyal Bilimler Enstitüsü, İstanbul.

[6] Ay S, 2012. Türkiye'de işsizliğin nedenleri: istihdam politikaları üzerine bir değerlendirme. Yönetim ve Ekonomi, 19, 321-341.

[7] Bayrakdar S, 2019. İşsizliğin çözümünde uygulanan aktif istihdam politikalarının etkinliği üzerine genel bir değerlendirme. Kırıkkale Üniversitesi İktisadi ve İdari Bilimler Dergisi, 33, 339-357.

[8] Uyar Bozdağlıoğlu Y, 2008. Türkiye'de işsizliğin özellikleri ve işsizlikle mücadele politikaları. Adnan Menderes Üniversitesi Sosyal Bilimler Dergisi, 20, 46-65.

[9] Bekiroğlu C, 2010. Türkiye'de işsizlik sorununun çözümlenmesinde uygulanan ekonomi politikalarının analizi. Yüksek Lisans Tezi, Kadir Has Üniversitesi Sosyal Bilimler Enstitüsü, İstanbul.

[10] Yıldız K, 2014. İşsizlik türleri, her bir işsizlik türünün toplam işsizlikteki payı ve çeşitli demografik parametrelerle ilişkisi. Uluslararası Hakemli Sosyal Bilimler E-Dergisi, 45.

[11] Kuvvetli Yavaş H, 2021. Türkiye'de genç kadın işsizliği ve işgücü politikaları. Çalışma ve Toplum, 1, 151-180.

[12] Tatar M, 2022. Covid-19 salgınının Türkiye'de kadın işsizliği üzerindeki etkileri. ASEAD, 9, 379-393.

The Concept of Central Education and the Historical Development of Vocational Education in Turkey

Ali ANTEPLİ[a*], Alper GEDİK[b]

[a] *Selçuk University, Beyşehir AA Faculty of Business Administration, Department of International Trade and Management, ali.antepli@selcuk.edu.tr*

[b] *Selcuk University, Beyşehir AA Faculty of Business Administration, Department of Business Administration, alpergedik@selcuk.edu.tr*

Abstract

In the education systems of developed countries, one of the most important reasons underlying the importance given to vocational education is meeting the demands of the industry. In today's world, where information is seen as an important capital element, it is predicted that societies with qualified workforce and quick access to useful information will have a say in the future of the world. In this context, continuous revisions are made on the efficiency of vocational education. In this study, the importance of vocational education and the historical processes of development in Turkey are discussed, and the emphasis is placed on the level of vocational education in industry and countries.

Keywords: Vocational Education, Economy, Vocational Education Centers

1. INTRODUCTION

One of the basic conditions of a sustainable and strong economy is a qualified workforce and a perfectly planned vocational training. In today's world, where information is seen as an important capital element, it is predicted that societies with qualified workforce and quick access to useful information will have a say in the future of the world. One of the important destructions of the Covid 19 epidemic is the disruptions in the supply chain. The global economic crises and the lack of trained personnel negatively affect the economies of the countries. The decrease in the supply of qualified personnel and the increase in demand have caused great difficulties in the world trade networks. For these reasons, all countries have to invest in human resources that will work in the goods and service sectors, logistics and information sectors and can respond to the demands of these sectors. In order to meet the needs of all these human resources, vocational education institutions should be rapidly modernized and infrastructure networks should be strengthened. The basic structure of vocational education is to gain knowledge, skills and habits related to a certain occupational field (art, industry, technique, agriculture, etc.) and to develop talents in these fields to meet the needs.

In the education systems of developed countries, one of the most important reasons underlying the importance given to vocational education is meeting the demands of the industry. For this reason, continuous revisions are made on the efficiency of vocational education, especially in order to strengthen its harmony with the labor market. Vocational education has always been one of the main items of the education agenda in Turkey. Many different projects have been carried out in recent years to increase and strengthen the efficiency of vocational education. Especially after the 2023 Education Vision announced at the end of 2018, very comprehensive and systematic steps were taken to solve the problems in vocational education. Significant transformations were achieved in a short period of three years, and its perception in both the labor market and society changed positively..

* Corresponding author.

The quality of their potential human resources is one of the most important criteria used to show the development levels of countries. From this point of view, it is seen that developed countries give priority to raising the qualified workforce resources required in their national development efforts in the desired quality and quantity. From the point of view of underdeveloped countries, they have serious problems in raising the human resources that economic development needs. Raising qualified manpower that will make the most important contribution to social development is the most basic task of education systems. The education system of a country, while fulfilling this primary duty contributing to development, should be a mechanism that trains all students as productive individuals, makes positive contributions to social life, trains them to ensure the sustainability of their professions, and prepares them for higher education. In order to achieve these goals, it is necessary to ensure the integrity of personal and professional development by fusing these functions consistently, especially at the secondary education level (Şimşek, 1999).

While the positive effects of vocational training are seen in issues such as the level of workers' wages, work efficiency and employment priority, vocational training also contributes to reducing unemployment and improving economic welfare in underdeveloped regions. The most basic economic benefit of vocational and technical education, which facilitates the adaptation of employees to the technological change in the workplace, is the positive outputs in the labor market and the institutional performance of the enterprises. (Cedefop, 2011: 4-18). The weaknesses of vocational education are; Inadequate implementation of the long-term policies and strategies of the public for political reasons, parents' preference for general secondary education instead of vocational education about the future of their children, low awareness of the importance of vocational education, lack of resources, clumsiness in adapting to technological innovations in schools can be listed as.

2. THE CONCEPT OF EDUCATION

According to behavioral psychology, education is the process of creating desired behavioral changes in individuals through learning experiences. (Erginer,2006)

According to the constructivist approach, education is the process of structuring one's own cognitive schemas through experiences, observation, trial and error. (Erginer,2006)

In general terms, we can define the concept of education as all the processes in which a person develops skills, attitudes and other forms of behavior that have value in the society he lives in. (Özcan, 2018) In other words; Education is the process of planned effects that serve to bring about certain improvements in the behavior of people according to predetermined principles. There are 3 main elements of education, which is considered as a process. These;

1. The “purpose” of education
2. All of the “teaching and learning activities” in the education process
3. They are “evaluation” items that are used to measure the quality of education.

One of the most important functions of educational science is to ensure that people meet at a common point by transferring the culture of the society. For this reason, ignoring such an important function of education, ignoring the importance of the culture transferred to future generations through education, and not considering today's children and youth as a part of the society and as an investment for the future cause very important problems for that society.

3. VOCATIONAL EDUCATION IN TURKEY

With the establishment of the Republic of Turkey, the importance given to vocational education has increased, and vocational education institutions have been transformed into structures attached to schools. Especially between 1920 and 1930, vocational education took the form of a state policy. With this development, vocational education has now been included in the education process and the basic concepts and principles of vocational education have begun to be established. At a meeting of the Turkish Grand National Assembly (TBMM) in 1928, "Providing vocational education from primary and secondary level to the highest level (…)" became a basic education policy (Erdoğan, 1990).

The fact that the structure of the Vocational Education of a country has an important place in the country's economy as it contributes to the increase in the employment and quality workforce of that country has made this structure a topic of discussion that attracts the attention of all countries in the global sense. While countries analyze the movements of their economies, they also revise vocational and technical education from the beginning. As it can be understood from here, the importance that countries give to vocational and technical education is directly proportional to their own level of development. The 2023 Education Vision announced by our Ministry of National Education also offers us a road map in terms of our country's economy and development plan. Our education vision is sensitive to the

sector, up-to-date according to the priorities of our country, and has a dynamic structure that can keep up with change at any time.

The most important changes regarding the structure of Vocational and Technical Education in our country have emerged with the Law No. 3308. In the aforementioned law, vocational and technical education on behalf of our country is handled in three basic approaches.

The models in the field of vocational and technical education in Turkey are as follows:

- Apprenticeship Training (Dual Training System)
- Full and Part Time School System
- Non-Formal Vocational Education (Vocational Courses) (Yıldırım & Çarıkçı, 2017).

When we look at the vocational and technical education plans around the world, we can say that the vocational and technical education in our country is competent in developing various models that take into account the developments in the world. However, it can be said that our Vocational and Technical Education has some technical difficulties. It can be stated that the source of the problems are the problems related to planning and coordination related to vocational education (Yıldırım & Çarıkçı, 2017).

Vocational education systems in Turkey and in the world are moving towards a dynamic and competence-based formation that is open to universal changes, based on employment analysis, directing people to the right job. International institutions see vocational education as an element that works in coordination with the sector that directs production and economy in a way that meets the workforce needs of the society and provides its students with competence in the international platform.

3.1. The Purpose of Vocational Education

The main purpose of Vocational Education is to ensure that individuals receive a good education and direct them to the best profession they can do, thus creating a qualified workforce. Therefore, thanks to vocational training, it contributes to both the individual working and the economic development of the country. A qualified individual means a developed state. The goal in vocational education is not only to raise qualified workforce, but also to raise good individuals and to move students to higher education programs if the desired success is achieved.

The aims of vocational education are included in the Vocational and Technical Education Law No. 3308 as training and employing candidate apprentices, apprentices, journeymen and masters, organizing various vocational courses, and engaging in other professional activities.

3.2. Qualities and Importance of Vocational Education

The dominance of automation and electronic brain instead of simple manual dexterity has brought about changes in the behavior of the technical workforce. Thus, it necessitated a certain level of content in technical personnel in terms of quick understanding, quick decision making and more appraisal. Therefore, adapting to new technologies has become the main issue of vocational training in today's modern society. Considering that vocational education continues for life and adults have to learn new professions in the face of developing technology, vocational and technical education planning should be multidimensional (Yazgeç, 2008).

In vocational education, training in the workplace is important to prepare the student for working conditions. It is necessary to train the qualified manpower needed by the manpower market in cooperation with enterprises, to be developed and disseminated by supporting it within the integrity of the vocational and technical education system (Yörük et al., 2002). It is extremely important to increase the quality of the workforce at all levels in Turkey. In order to achieve this goal, it is necessary to develop the vocational and technical education system and increase its qualifications. Organized and implemented effectively to meet the needs of people and business life, vocational training is effective in the development of the country and in the increase of employment.

- **Formal Vocational Education**

Formal vocational education in Turkey, vocational high schools in secondary education; In higher education institutions, two-year vocational schools and four-year vocational and technical education faculties come to mind. Formal vocational education is carried out in the businesses around the school, apart from the workshops and laboratories in the school. As a part of formal education, students spend 1 day at school and work as a work force in businesses. This kind of coordinated operation is guaranteed by different protocols between school and industry.

As a result, in the new education process developing in the context of education-employment; Both students and educational institutions have entered a process where they structure their equipment over the determinants of employment markets (Uzunyayla, 2007).

- **Vocational Education at Secondary Education Level**

In developed countries, the secondary education system is organized as general secondary education and vocational secondary education, and the emphasis is on vocational secondary education (Özyılmaz, 2013). Thus, the need for qualified workforce is met not only through universities in higher education, but also through vocational high schools and vocational schools in the previous stages.

For this reason, the number of vocational education institutions should be higher than general schools. However, our country is trying to enter the European Union on the one hand and to become an information society on the other. All of these, rapid developments and changes in science and technology both create the need for a "qualified workforce" and make it mandatory for current employees to receive in-service training. As a result of these, vocational training centers have great responsibilities.

Vocational and technical secondary education institutions provide education in many branches. While accepting students in such schools, the type of school and the chosen branches vary. Students can be interviewed, a medical report can be requested, students who do not seem sufficient can be directed to other branches. Transfers and transfers of registered students between branches are carried out subject to certain regulations. At the end of the education given, students receive a diploma in their field. This diploma gives them the title of mastery.

- **Vocational Education at the Higher Education Level**

Vocational education at the higher education level is divided into two. These; vocational schools aiming to train a technically equipped and qualified workforce, and vocational and technical education faculties aiming to train teachers for vocational high schools and vocational education centers.

In the first version of the Higher Education Law No. 2547, the expression "intermediate manpower" in the definition of vocational school, which was defined as "a higher education institution that continues education for four semesters aiming to train intermediate manpower for certain professions", was changed to "qualified manpower" with the Law No. 6111. With this regulation, vocational schools are defined not as technical intermediate staff, but as an institution that trains qualified personnel needed by the labor market. (Ozsoy, 2007)

Vocational schools are divided into 3 different sections in terms of the way they are established. One group is those opened within state universities, the other group is those opened under foundations, and the last group is those established by foundations in accordance with Article 1 of Law No. 4702.

Vocational schools determine their own vocational education programs and course content. In these schools, education is given in technical programs, economic and administrative programs, health programs and maritime programs.

Vocational high school students, like vocational and technical secondary school students, have skill training obligation in enterprises, and they are required to complete skills training for at least thirty and maximum sixty workdays in the months that coincide with the semester and summer holidays while continuing their education. (Ozsoy, 2007)

The Law No. 4702 provided students who graduated from vocational high schools or vocational education centers with additional points to pass to vocational higher education institutions from their own programs or the closest sub-branches to their programs, thus providing the right to pass without examination. As a result of this, we can say that the students of vocational and technical colleges mostly consist of vocational and technical secondary education institutions, that is, vocational high schools or vocational education centers.

4. THE HISTORICAL PROCESS OF VOCATIONAL EDUCATION IN TURKEY

4.1. Vocational Education in the Pre-Republican Period

The basis of vocational education II. Abdulhamid converted the correctional institutions into industrial schools. Industrial schools recruited from correctional facilities were made widespread throughout the country. In this period, modernization gained speed, besides, the rate of schooling increased, and the state tried to raise the level of education. As a result of these, the need for vocational training has increased. Thus, the education system has become a structure that gives importance to vocational and technical education.

As another presenter of these developments, vocational technical colleges such as Trade Schools, Hendese-i Mülkiye Mektebi, Sanayi-i Nefise Mektebi were established in higher education institutions. Understandings such as being self-sufficient and efficient in production also led to the emergence of Agricultural Schools. II. In the Second Constitutional Era, the vocational education mobility, which was also based on the Compensation period, was shaped to keep up with the necessity of the century.

With the diversification of the needs of the period, different branches began to emerge within the industrial schools. The state has developed in a bureaucratic sense, so the need for bureaucracy has led to the opening of new schools. Especially girls' vocational high schools gained momentum in this period, enabling girls to enter business life as well.

It is understood from this that vocational high schools are not only concerned with raising labor force, but also leading a social revolution.

While these modernization movements were in full swing, important wars of the period began to emerge, and in these times when these wars and political developments were evident, vocational education developments were interrupted. In the last half of the 18th century, Vocational and Technical Education gained momentum in the Ottoman period, despite all these crises and economic difficulties, even political turmoil. While these developments continued, the emerging Balkan wars and the First World Wars dealt a serious blow to professional development.

- **Ahi Organization**

Akhism, which is a very effective operation of the Turks in terms of education and social aspects, passed to the Turks from the word "ahi", which means "brother" in Arabic. However, it is recorded that the word “ahi” in Divan-ı Lügatit Türk comes from “Akı”, meaning generous, generous (Ekinci, 1991).

Although it is not known exactly where and when the Ahi unions were founded, some historical events give an idea about the establishment, development and dissolution of this union (Bakır, 1991).

The Ahis are seen as a unit and there are two different views about where these units come from. One of these is the view that the Ahi-order as an organization was first established in Islamic communities by the Abbasid caliph En Nasrlidinillah. The transfer of this organization to Turkish communities dates back to the X. Century. We can say that the Karakhanids, which we know as the first Muslim Turkish State of the time, were the first Turkish community to accept the ahi-order organization.

Another thought about how the organization of the Akhism passed to the Turkish states; According to the scientists who studied the word similarities and the sources of the words, they accepted that the word Ahilik was a continuation of the Byzantine guilds.

However, as researches on ahi unions increase, the truth becomes clearer and it is understood that these claims are not based on any basis (Ekinci, 1991). According to this, Ekinci states that the Ahi organization belongs entirely to the Turks.

In other words, it is possible to say the following about the Ahi unions; Ahis is an organization established to preserve the social, economic and political order among people working under any profession.

Another factor that enabled the rapid spread of Akhism among Muslim Turkish communities is that the first condition for joining the organization is that the person must be a Muslim. Ahi unions initially emerged as an organization that included tanners, saddlers and shoemakers, and over time it became a multi-faceted organization that gathered all tradesmen and those who wanted to become members (Bakır, 1991).

There are certain degrees of license in Akhism. These;

1- Patchwork
2- Apprenticeship
3- Journeyman
4- It is Mastery (Mastery).

The Ahi organization also has its own regulation. This regulation is called futuwwa name. It is necessary for an apprentice to know at least 124 articles of this 740-item futuwwa, to keep his master's word, to have good morals, to introduce himself to the community he is in, to dress cleanly and neatly, etc. had such duties. Transitions from apprenticeship to journeyman, from journeyman to master were made with ceremonies. Such ceremonies have been continued for centuries because they believed in their educational and unifying function (Turan, 1992).

- **Guild System**

The word guild is Lociye Loggia in Italian; It is derived from the French words Loj (Loge) (Özdemir, 1986). When the Ahi-order unions could not keep up with the innovations of the period, they started to show changes and as a result of these changes, new tradesmen's organizations called guilds emerged. These guilds, which were formed by being recruited from the Ahi order, played an effective role in the development of the Ottoman state's economy for centuries.

Although the name of the guild was called the place where raw materials were given to the people in need in the early periods, the guild is actually a concept that expresses the place where people with the same profession come together under the control of a sheikh and a pir (Gürata, 1975). The guilds of the artisans operating in different bazaars such as the Blacksmiths' Bazaar and the Coppersmiths' Bazaar are also named after their own names. In the guilds, tradesmen and employees from the same profession would come together, help each other, and be useful in the development of the regions they were in. In these regions, they established bazaars such as "Blacksmiths - Bakırcılar", which are unique to them. Guilds are state-controlled organizations. In addition, each guild has a flag with its own symbol on it (Yazıcı, 1996).

Especially in the 18th century, the guilds, which lived their golden age, fulfilled some important functions in the social and economic life of the Ottoman Period (Altıntaş, 2010). Because the craft and trade guilds operating in Ottoman cities appear as the central institutions of economic and commercial life (Pamuk, 2001).

Considering these developments, it can be said that one of the primary functions of the guild organization is to act as a bridge between the government's administrative level and the tradesmen, the people of the city and the rural areas. In fact, it can be said that the state guilds carry out a population census in general, since people working in every profession are obliged to register with the guild that is related to them.

Features such as the formation of coordination between the guilds and the tradesmen registered to them, establishing their own self-discipline rules before operating in a commercial sense, providing a standard for the workers they will employ, and providing equal and unconditional support to the artisans by the state are still effective business ethics today.

4.2. Vocational Education in the Republican Era

Since the first years of the Republic, vocational education began to be handled in a more planned and systematic way in the studies carried out for modernization and development. First of all, as a result of our industrialization policy, vocational training has become a necessity with the increase in the need for qualified workforce. Rather than the trade school that was opened, many vocational education institutions were opened, from tailoring schools, from fishing schools to cooking schools, from carpentry schools to construction technical vocational high schools. In addition, girls' vocational high schools, which give priority to the education of girls, started to provide education to their students in branches such as child care and home economics.

With the proclamation of the Republic, vocational and technical education began to be handled in an organized manner in schools. Vocational education, which was organized in a more planned and regular way, started to be given in schools affiliated to the Ministry of National Education as of 1926. In 1935, with the Law No. 2765, the expenses of the schools providing this type of vocational education were completely paid by the state. The Ministry of National Education established the General Directorate of Vocational and Technical Education in 1933, and then the Undersecretariat of Vocational and Technical Education in 1941. In the 1940s-1950s, it is seen that vocational education developed rapidly and became widespread (Yörük et al., 2002).

- **Girls Art Schools**

In the first period of the Republic, the Ministry of National Education built two Girls' Art Schools in Istanbul. One of them was in Üsküdar and the other in Çapa. In girls' vocational high schools, education was given in branches such as child education, home economics, clerkship, and civil service. Of course, these developments were followed by other provinces, and the Girl Life School in Bursa, which coincided with the same period, was put into operation. In the later years of the Young Republic, a girls' vocational high school was established in İzmir, which also provides education for girls in basketry and floristry branches. In the same period, schools providing agricultural education under the Ministry of Agriculture were established within the Girls' Art School in Erzurum.

- **Boys Art Schools**

Known as a culture that passed from the Ottoman state to the Republic of Turkey, the number of art schools specific to male students was 15 in 1926. These were located in various provinces of the country. These are Ankara, Aydın, Bursa, Diyarbakır, Edirne, Kastamonu and İzmir industrial schools.

Men's Art Schools were institutions that gave education for 5 years at first, then 3-year middle art schools were established. Men's art schools are designed to provide vocational and technical education to those who want to improve themselves professionally as well as providing general education.

In the first years of the Republic, men's art schools made large contributions to the economy of the newly established Republic by graduating a large number of male students. Both in terms of providing qualified workforce and intermediate staff, male art schools have contributed to the economy in all occupational fields that the industry needs. Men's art schools, the first opening years of which date back to 1943, were transformed into industrial vocational high schools as of 1973.

- **Trade Vocational Schools**

Turkey, which started to open up to the West in terms of exports and imports with the Treaty of Lausanne, started to open these schools in order to train the personnel needed for commercial institutions (Turan, 1992).

During the opening period of Commercial Vocational High Schools, vocational and technical education has completed its development, and a new step has been taken with planned development projects in the following years. In these planned periods, education was seen as a key force for the development of the country. For this reason, more importance has been given to such institutions that train qualified personnel who know the job.

In the recent past, "Strengthening the Vocational Education and Training System in Turkey Project" (ME-GEP) was signed between the Republic of Turkey and the European Union as of 2000. With the signing of this project, studies for the labor force of our country have begun. It has planned vocational and technical education in modules in order to make the young workforce qualified. Thus, it can be said that a modular system is implemented in these institutions.

The modular system is a system that operates by dividing the courses given in vocational education into clusters within itself. These courses are divided into various groups as compulsory, elective, vocational, general and applied. At the end of each module, students who have reached the required level of proficiency are awarded a certificate.

These certificates show that the graduates are evaluated at the end of the modules, have reached the sufficient qualifications, acquired many transferable abilities at the end of the education, exhibited sufficient skills in the field of study, and finally gained the right to practice this profession.

Programs within the scope of SVET have been prepared in line with international occupational classification, occupational standards, educational standards and professional competencies (Uçar et al., 2013).

5. CONCLUSION

The most determining criteria of a country's economic welfare indicators are the development level of the current society and the education system. It is a social and political responsibility of a developed country to ensure the development of the individuals who make up the society and to equip them with new qualities. "Vocational Education" has an important place in the education system because of the many features it contains. The reason for this is that every society that wants to develop in the economic and political context has to get maximum efficiency by using its employment in the most appropriate way. This necessity increases the importance that the country should give to vocational education.

Today, it is seen that almost all countries, which are among the developed countries, give importance and importance to vocational education in their education systems. It is of great importance to design the vocational education system correctly in order to have a qualified workforce, which is seen as a macro variable that directly affects the country's economy.

References

[1] Ak, M. (2006). II. Meşrutiyet Döneminde Mesleki ve Teknik Eğitim Okulları, Yüksek Lisans Tezi, Pamukkale Üniversitesi, Sosyal Bilimler Enstitüsü, Denizli.

[2] Alkan,C.Doğan,H.,Sezgin,S.İ.(Kasım 2008). Mesleki ve Teknik Eğitimin Esasları, Nobel yayınları, Ankara.

[3] Altıntaş, A.M. (2010). The World of Ottoman Guilds: The Issue of Monopoly. History Studies, 2/3 (1), 11-23.

[4] Ayçiçek K. (2012). Belediyelerin yaygın eğitim çalışmalarına bir örnek olarak Şişli Belediyesi. Yüksek Lisans Tezi. Istanbul Aydın Üniversitesi, İstanbul.

[5] Bakır M. A. (1991) Ahilik ve Mesleki Eğitim, İstanbul Üniversitesi, SBE, Yüksek Lisans Tezi, İstanbul, s.1.

[6] Bülbül, S. (1987). Dünya ve ülkemizde yaygın eğitim. Yaygın Eğitim ve Sorunları, TED 11. Eğitim Toplantısı, 12-13 Kasım Dizisi.

[7] Demirel, Ö. (2001). Eğitim sözlüğü, (1. Bs) Ankara: Pegem Yayınevi.

[8] Doğan,H.,Hacıoğlu,F.,Ulusuy, A.,(1997)Okul Sanayi İlişkileri, Ankara,Türkiye.

[9] Erdoğan, Yakup; İstihdamda Beceri Eğitiminin Yeri, Marmara Üniversitesi, Yayımlanmamış Yüksek Lisans Tezi, İstanbul 1990, s,57.

[10] Erginer, A (2006). "Eğitim Bilimine Giriş Dersi," İlköğretmen Eğitimci Dergisi, s.50 52, Ankara.

[11] Erkek Teknik Öğretim Genel Müdürlüğü. (2014). http://mtegm.meb.gov.tr/TR/protokoller.asp?sayfa=liste, Erkek Teknik Öğretim Genel Müdürlüğünce yapılan protokoller,

[12] Fidan, N., Erden,M., (1988). *Eğitime giriş.* Istanbul: Alkım Yayınevi.

[13] Gürata, M. (1975). Unutulan adetlerimiz ve loncalar. Ankara.

[14] Kılınç, M. (2012). Türkiye'de Mesleki Teknik Eğitimi Şekillendiren Eğitim, Kurumlarından, Ahilik, Gedik, Lonca, Enderun Mektebinin Tarihsel Gelişimleri, ISSN:1306-3111,e-journal of New World Sciences Academy, Volume:7,Number:4 Article Number:2c0045.

[15] Öksüz, N. (2007). Mesleki Eğitim Kurslarının Kadınların İstihdam Edilebilirliğine Katkısı Ve İşkur'un Üstlenebileceği Roller, Çalışma Ve Sosyal Güvenlik Bakanlığı, Türkiye İş Kurumu Genel Müdürlüğü, Ankara.

[16] Özsoy, Ceyda; Türkiye'de Mesleki ve Teknik Eğitimin İktisadi Kalkınmadaki Yeri ve Önemi, Anadolu Üniversitesi, Yayımlanmamış Doktora Tezi, Eskişehir 2007, s.109.

[17] Sürmen G.Y. (2011). Türk milli eğitiminde örgün eğitimin yeri ve okul öncesi eğitim,.Yüksek Lisans Tezi. Beykent Üniversitesi, İstanbul.

[18] Şahin, İ. ve Fındık, T. (2008). Türkiye'de Mesleki Ve Teknik Eğitim: Mevcut Durum, Sorunlar ve Çözüm Önerileri, Türkiye Sosyal Araştırmalar Dergisi (TSA), 12 (3), ss. 65-86.

[19] Turan, K.(1996). Ahilikten Günümüze Mesleki ve Teknik Eğitimin Tarihi Gelişimi, M.Ü. İlahiyat Fakültesi yayınları, No:129,İstanbul.

[20] Uzunyayla, F. (2007). Avrupa birliği'ne giriş sürecinde eğitim ve istihdam politikaları.(Yayımlanmamış yüksek lisans tezi). Marmara Üniversitesi Sosyal Bilimler Enstitüsü, İstanbul.

[21] Yazgeç, S., (2008), Mesleki Eğitim Merkezi Metal Teknolojisi – Makine Teknolojisi Bölümlerinde Öğrenim Gören Öğrencilere, İşletmelerde Uygulanan Mesleki Eğitim (Pratik Eğitim) Çalışmalarının Değerlendirilmesi, Yüksek Lisans Tezi, Yeditepe Üniv. Sosyal Bilimler Enstitüsü, İstanbul, Türkiye,19-20.
[22] Yazıcı, N. (1996). "Lonca Sisteminin İşsizlik Sigortasıyla İlgisi Üzerine, Bazı Düşünceler". Ankara Üniversitesi İlahiyat Fakültesi Dergisi, 35 (1), 155-165.
[23] Yıldırım, A., & Çarıkçı, O. (2017). Mesleki eğitimin gelecek vizyonu; İnsan Kaynakları planlaması açısından bir bürokratik model denemesi. Süleyman Demirel Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, 4(29), 397-413.
[24] Yörük, S., Dikici, A., Uysal, A.(2002), Bilgi Toplumu ve Türkiye'de Mesleki Eğitim,Fırat Üniversitesi Sosyal Bilimler Dergisi, Cilt:12, Sayı:2, Sayfa: 299-312, Elazığ.

Personnel Selection Using ARAS Method with Objective Weights

E. Ertugrul KARSAK [a*], Ece UCAR [b]

[a] *Galatasaray University, Industrial Engineering Department, Ortakoy, Istanbul, Turkey, ekarsak@gsu.edu.tr*
[b] *Galatasaray University, Industrial Engineering Department, Ortakoy, Istanbul, Turkey, eucar@gsu.edu.tr*

Abstract

Personnel selection, which aims to evaluate the candidates and/or identify the best candidate for a defined job considering the required qualifications, is a key topic for human resource management. The increasing importance of personnel selection decisions promotes the use of multi-criteria decision making methods. This study proposes to employ the Additive Ratio Assessment (ARAS) method with objective weighting schemes for the recruitment process of a financial institution. A common-weight data envelopment analysis (DEA)-based model, which aims to minimize the sum of deviations from efficiency, and the entropy method are considered for objective determination of criteria weights. The proposed methodologies employing ARAS with minsum efficiency weights and ARAS with entropy weights yield full ranking of candidates as well as identify the best candidate in the personnel selection problem, and provide a realistic evaluation with practical dispersion of criteria weights. Comparative analysis shows that the ranking outcomes of both approaches are consistent.

Keywords: Personnel selection, multi-criteria decision making, ARAS, DEA-based minsum efficiency, entropy.

1. INTRODUCTION

Personnel selection can be defined as the process of selecting candidates who can perform a defined job with the required qualifications in a suitable way. Considering the competitive business environment, this process has become an important issue for human resource management. In the literature, various studies have been proposed on resumes, interviews, assessment centers, job knowledge tests, work sample tests, cognitive tests, and personality tests in human resource management to help companies make better evaluations of candidates [1].

Some of the research works considered the personnel selection process as a multi-criteria decision making (MCDM) problem with the candidates as the alternatives of the MCDM problem while the job qualifications are considered as the criteria. Karsak [2] proposed a fuzzy MCDM approach based on ideal and anti-ideal solutions incorporating qualitative as well as quantitative data into the personnel selection problem. Dursun and Karsak [3] developed a fuzzy decision making approach based on fusion of fuzzy information, 2-tuple linguistic representation model, and Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) for personnel selection. Lin [4] integrated the analytic network process (ANP) and fuzzy data envelopment analysis (DEA) for the personnel selection problem in an electric and machinery company in Taiwan. The results showed that the proposed approach could lead to more persuasive and convincing evaluations of the candidates. Warning [5] employed DEA with assurance region (AR) for facilitating personnel selection by considering managers' preferences. Taylan et al. [6] proposed an integrated approach considering fuzzy decision tree for determining the weights of criteria, fuzzy TOPSIS for ranking the alternatives, and finally DEA for deriving quantitative insights.

* Corresponding author.

In this study, the Additive Ratio Assessment (ARAS) method is proposed to evaluate candidates in the recruitment process of a bank. ARAS is an MCDM method that compares the alternatives (in here, the candidates) according to the utility function value, which is defined as the complex relative efficiency of a feasible alternative and which is directly proportional to the relative effect of weighted criteria values. The utility function value of a candidate is the ratio of the sum of the weighted normalized criteria values to the sum of the weighted normalized criteria values obtained from the ideally best candidate. As the performance measure of a candidate is directly proportional to the weighted criteria values and is compared with the best candidate, the ARAS method is seen as a sound method among the MCDM techniques. The ranking of the candidates is established considering the utility function values, where the highest utility function value belongs to the best candidate. For defining the utility function values in ARAS, the weights of criteria need to be determined with weighting methods.

As the performance evaluations are generally based on the weighted criteria values, weighting methods are of key importance for MCDM problems. In the literature, criteria weights are commonly determined with the subjective weighting approaches based on experts' judgments [7]. The well-known subjective evaluation methods can be listed as the Analytic Hierarchy Process (AHP) [8], the Analytic Network Process (ANP) [9], the Delphi method [10], the stepwise weight assessment ratio analysis (SWARA) [11], and the factor relationship (FARE) [12]. Although these methods aid to reflect the opinions of the experts, they may lead to inconsistent subjective evaluations and impractical weight flexibility. This situation may create unrealistic weights that overlook a number of criteria throughout the decision making process by assigning negligible weights. In order to overcome these limitations, the use of objective weighting methods can be considered.

The objective weighting methods enable determining the actual degree of each criterion's dominance, i.e., the objective weights of criteria [7]. The entropy method [13], the LINMAP method [14], and mathematical programming techniques [15] for determining the criteria weights can be considered in this group of weighting methods. In this study, the use of two objective weighting methods for personnel selection problem is considered. The first objective weighting method is based on a common-weight DEA-based decision making approach proposed by Karsak and Goker [16] that uses the concept of minimizing the sum of deviations from efficiency and provides improved weight dispersion avoiding impractical weight flexibility. The second objective weighting scheme is the entropy method, which has a widespread use in decision making problems [17]. These two weighting schemes are used to assign criteria weights for the ARAS method, which will be employed for personnel selection in a financial institution. The rankings of the candidates obtained from employing ARAS with minsum efficiency weights, and ARAS with entropy weights are compared for testing the robustness of the proposed approach.

The rest of the paper is organized as follows. Section 2 delineates the basics of the ARAS method, while Section 3 presents the objective weighting schemes employed in this study. In Section 4, a case study regarding the recruitment process of a financial institution is provided. Concluding remarks are given in the last section.

2. ADDITIVE RATIO ASSESSMENT METHOD

The Additive Ratio Assessment (ARAS) method proposed by Zavadskas and Turskis [18] is an MCDM technique that ranks the alternatives according to the utility function values, which determine the complex relative efficiency of a feasible alternative and directly proportional to the relative effect of weighted criteria values. The ranking of the alternatives (in here, the candidates) can be obtained considering the utility function values, where the highest utility function value belongs to the best performing alternative. The utility function value of an alternative is the ratio of the sum of the weighted normalized criteria values to the sum of the weighted normalized criteria values obtained from the ideally best alternative. The first step of the method consists of constructing the decision matrix **X** given below, with *m* feasible alternatives and *n* criteria, as follows:

$$\mathbf{X} = \begin{bmatrix} x_{01} & \cdots & x_{0j} & \cdots & x_{0n} \\ \vdots & \ddots & \vdots & \ddots & \vdots \\ x_{i1} & \dots & x_{ij} & \dots & x_{in} \\ \vdots & \ddots & \vdots & \ddots & \vdots \\ x_{m1} & \dots & x_{mj} & \dots & x_{mn} \end{bmatrix}; i = 0, \dots m; j = 1 \dots n, \quad (1)$$

Here, x_{ij} is the performance value of alternative *i* representing criterion *j* while x_{0j} is the optimal performance rating of the *j*th criterion, which is defined as:

$$x_{0j} = \begin{cases} max_i\, x_{ij}, if\ \ max_i\, x_{ij}\ \ is\ preferable, \\ min_i\, x_{ij}, if\ \ min_i\, x_{ij}\ \ is\ preferable. \end{cases} \quad (2)$$

The second step is the normalization of criteria values. In order to obtain dimensionless criteria values that enable comparison among criteria, the criteria values are normalized as follows:

$$\bar{x}_{ij} = \begin{cases} \dfrac{x_{ij}}{\sum_{i=0}^{m} x_{ij}}, if\ criterion\ i\ is\ benefit\ type \\ \dfrac{1/x_{ij}}{\sum_{i=0}^{m} 1/x_{ij}}, if\ criterion\ i\ \ is\ cost\ type \end{cases} \tag{3}$$

where $\bar{x}_{ij}$ denotes the normalized performance rating of alternative *i* with respect to criteria *j*.

The third step is constructing the weighted normalized decision matrix, $\widehat{X}$.

$$\hat{X} = \begin{bmatrix} \hat{x}_{01} & \cdots & \hat{x}_{0j} & \cdots & \hat{x}_{0n} \\ \vdots & \ddots & \vdots & \ddots & \vdots \\ \hat{x}_{i1} & \dots & \hat{x}_{ij} & \dots & \hat{x}_{in} \\ \vdots & \ddots & \vdots & \ddots & \vdots \\ \hat{x}_{m1} & \dots & \hat{x}_{mj} & \dots & \hat{x}_{mn} \end{bmatrix} \tag{4}$$

where the weighted normalized performance ratings are calculated as

$$\hat{x}_{ij} = w_j\, \bar{x}_{ij}\ , i = 0,1, \dots, m; j = 1,2, \dots, n. \tag{5}$$

Here, w_j denotes the weight associated to criterion *j*, and the sum of weights is equal to 1, i.e. $\sum_{j=1}^{n} w_j = 1$. The criteria weights can be determined by various methods utilizing subjective or objective weighting schemes. In this paper, we propose to determine the criteria weights using objective weighting schemes that will be explained in the following section.

The next step is calculating the optimality function value for each alternative:

$$S_i = \sum_{j=1}^{n} \hat{x}_{ij}\ , \qquad i = 0, 1, \dots, m, \tag{6}$$

where S_i represents the value of the optimality function for alternative *i*, for which the highest value of S_i is preferred. The optimality function values are directly proportional to the weighted normalized criteria values.

The final step is defining the utility degree, in other words the utility function value K_i for alternative *i*, as

$$K_i = \frac{S_i}{S_0}, \qquad i = 0,1, \dots, m, \tag{7}$$

where S_0 is the overall performance index of optimal alternative. K_i takes values in the [0,1] interval, and alternatives are ranked in descending order, where the best alternative has the highest utility function value. According to the ARAS method, the utility function values represent the complex relative efficiency of the alternatives. As these values are directly linked to the weighted normalized performance ratings, the ARAS method is seen as a practical approach.

3. OBJECTIVE WEIGHTING METHODS

In MCDM, criteria weights are of vital importance in evaluating alternatives. In the literature, criteria weights are commonly determined with subjective weighting methods based on experts' judgments [7]. These methods are useful for integrating experts' preferences into the decision making framework. However, they may lead to impractical weight flexibility and unstable subjective evaluations of the alternatives. A decision maker can assign a relatively high importance to a criterion while disregarding the proper consideration of other criteria. Moreover, impractical weight flexibility may impede to include a number of relevant criteria properly into the decision making process. Hence, it would not be possible to observe the effects of all criteria regarding performance evaluation of the alternatives. In order to overcome these limitations, the use of objective weighting methods is proposed.

3.1. DEA-based minsum efficiency model

Data envelopment analysis (DEA) is a non-parametric mathematical programming-based decision making technique proposed by Charnes et al. [19], which evaluates the relative efficiency of homogenous decision making units (DMUs) considering multiple inputs and multiple outputs. Common-weight DEA-based approaches, which enable performance evaluation with common attribute weights, are proposed to curb impractical weight flexibility as well as improve the discriminatory characteristics of DEA [20].

The minsum efficiency model proposed by Karsak and Goker [16] is a common-weight DEA-based approach that aims to minimize the sum of deviations from efficiency. The model guarantees to identify the best performing DMU by solving a single linear program at the first stage and a mixed integer linear programing model at the second stage. The model results in sound dispersion of output weights and prevents unrealistic weight flexibility. In this study, the first stage of the minsum efficiency approach will be employed for determining criteria weights. The mathematical programming model can be written as follows:

$$min \ \sum_{j=1}^{n} d_j \tag{8}$$

subject to

$$\sum_{r=1}^{s} u_r y_{rj} \Big/ x_j + d_j = 1, \qquad j = 1,2, \dots, n$$

$$u_r \geq \varepsilon, \quad r = 1,2, \dots, s$$

$$d_j \geq 0, \quad j = 1,2, \dots, n$$

where d_j represents the deviation from efficiency of decision making unit (in here, candidate) j, u_r denotes the weight of output r, y_{rj} is the amount of output r for DMU j, x_j denotes the amount of single input associated with the jth DMU, s is the number of outputs, and n is the number of DMUs. Finally, ε is a small positive number, which is added to the model for yielding nonzero weights.

3.2. Entropy method

The concept of entropy is proposed by Shannon [13] as a measure of uncertainty in information. In particular, the entropy idea is useful to investigate contrasts between sets of data. In MCDM problems, entropy method is regarded as an objective and reliable weighting scheme, and thus, it is commonly used in practice [17]. The first step of the method consists of normalizing criteria as

$$p_{ij} = \frac{x_{ij}}{\sum_{i=1}^{m} x_{ij}} \quad , i = 1, 2, \dots, m; j = 1, 2, \dots, n, \tag{9}$$

where x_{ij} is the jth criterion value for candidate i, m denotes the number of candidates, and n represents the number of criteria.

The entropy value E_j of criterion j is computed as follows:

$$E_j = -\frac{\sum_{i=1}^{m} p_{ij} \cdot ln(p_{ij})}{ln(m)} \quad , j = 1, 2, \dots, n, \tag{10}$$

where $0 \leq E_j \leq 1$. The larger the E_j is, the greater the differentiation degree of criterion j. Finally, the entropy weights are calculated as

$$w_j = \frac{1 - E_j}{\sum_{j=1}^{n} (1 - E_j)} \quad , j = 1, 2, \dots, n, \tag{11}$$

where the sum of criteria weights equals to 1, i.e. $\sum_{j=1}^{n} w_j = 1$.

4. CASE STUDY

In this section, the ARAS method is employed to address a personnel selection problem in the banking sector. The case study consists of evaluating 279 candidates, who have applied for a vacant position in a financial institution, using nine criteria with greater values preferred [21]. The criteria considered throughout the analysis are "quantitative ability", "verbal ability", "spatial capacity", "general culture", "current culture", "dynamism", "strength", "sociability", and "self-confidence" [21]. A linear normalization procedure is used to normalize the performance values of candidates with respect to criteria.

The criteria weights required in ARAS are determined with the DEA-based minsum efficiency model [16] and the entropy method [13]. A dummy input, which equals to 1 for all candidates, is used in the modeling framework to determine minsum efficiency weights. Table 1 presents the set of criteria weights obtained from DEA-based minsum efficiency model and entropy method, respectively. As observed from Table 1, both methods result in realistic dispersion of criteria weights, which lead to plausible evaluation of the candidates. The rankings of the candidates using the proposed approaches are given in Table 2.

Table 1. Criteria weights obtained from objective weighting methods

Weights	DEA-based minsum efficiency model	Entropy
w_1	0.303315	0.115902
w_2	0.043340	0.102746
w_3	0.059847	0.099095
w_4	0.000001	0.091159
w_5	0.067695	0.091154
w_6	0.014934	0.070416
w_7	0.454116	0.058753
w_8	0.212103	0.077277
w_9	0.135833	0.293497

ARAS with minsum efficiency weights and ARAS with entropy weights yield full ranking of the candidates while $Candidate_{83}$ is identified as the best candidate using both approaches. Spearman rank correlation coefficient between the rankings obtained from ARAS with minsum efficiency weights and ARAS with entropy weights is calculated as 0.7672. Thus, we may conclude that the proposed approaches result in similar rankings.

5. CONCLUDING REMARKS

In this study, the ARAS method is considered for evaluating the candidates for a vacant position in a bank. Considering the limitations of subjective weighting of criteria such as inconsistent subjective evaluations and impractical weight flexibility leading to unrealistic outcomes, two objective weighting schemes are employed for determining the criteria weights used in ARAS. The first objective weighting scheme is based on a common-weight DEA-based model that minimizes the sum of deviations from efficiency and provides an improved dispersion of weights. The second objective weighting scheme is the entropy method, which has been widely used in MCDM problems for evaluating the amount of uncertainty in criteria. The proposed approaches employing ARAS with minsum efficiency weights and ARAS with entropy weights determine the best candidate for the personnel selection problem as well as provide consistent ranking with plausible dispersion of criteria weights.

A case study that considers the recruitment process of a bank is conducted with 279 candidates and nine attributes regarding general skills, general knowledge and personalities. Finally, the same candidate is identified as the best using both approaches. The correlation between the rankings of the candidates obtained from the employed approaches is found to be statistically significant, which sets forth the consistency of the proposed methodology.

As a future research direction, the proposed weighting schemes can be combined with other MCDM methods for comparative purposes. Moreover, the proposed approach can be applied to other real-world decision making problems.

Table 2. Overall ranking results

Candidate	Ranks from ARAS & minsum efficiency weights	Ranks from ARAS & entropy weights	Candidate	Ranks from ARAS & minsum efficiency weights	Ranks from ARAS & entropy weights	Candidate	Ranks from ARAS & minsum efficiency weights	Ranks from ARAS & entropy weights	Candidate	Ranks from ARAS & minsum efficiency weights	Ranks from ARAS & entropy weights	Candidate	Ranks from ARAS & minsum efficiency weights	Ranks from ARAS & entropy weights
1	246	256	**41**	250	236	**81**	180	140	**121**	22	53	**161**	16	60
2	172	79	**42**	68	49	**82**	17	54	**122**	81	155	**162**	45	27
3	224	215	**43**	23	93	**83**	1	1	**123**	240	244	**163**	101	92
4	199	212	**44**	39	87	**84**	210	83	**124**	76	56	**164**	88	41
5	214	247	**45**	141	195	**85**	10	23	**125**	54	80	**165**	175	129
6	171	162	**46**	100	197	**86**	265	222	**126**	89	123	**166**	82	48
7	75	105	**47**	226	228	**87**	90	22	**127**	219	179	**167**	221	254
8	177	213	**48**	212	210	**88**	206	243	**128**	11	26	**168**	257	221
9	77	69	**49**	43	73	**89**	262	216	**129**	181	116	**169**	72	189
10	153	199	**50**	126	135	**90**	24	15	**130**	169	173	**170**	103	114
11	200	131	**51**	218	191	**91**	21	10	**131**	244	218	**171**	55	8
12	38	68	**52**	230	208	**92**	108	117	**132**	128	224	**172**	4	3
13	46	24	**53**	53	45	**93**	62	172	**133**	231	147	**173**	35	55
14	107	88	**54**	104	167	**94**	42	52	**134**	102	17	**174**	220	261
15	275	262	**55**	50	40	**95**	129	110	**135**	203	186	**175**	205	223
16	58	37	**56**	9	11	**96**	109	36	**136**	40	104	**176**	249	188
17	119	130	**57**	184	127	**97**	48	81	**137**	186	150	**177**	241	70
18	3	9	**58**	49	63	**98**	278	278	**138**	27	108	**178**	127	75
19	92	122	**59**	247	220	**99**	165	85	**139**	32	77	**179**	146	201
20	215	148	**60**	70	59	**100**	144	18	**140**	135	178	**180**	65	6
21	264	260	**61**	189	89	**101**	94	145	**141**	7	7	**181**	149	194
22	225	157	**62**	130	62	**102**	87	138	**142**	164	241	**182**	263	265
23	274	264	**63**	111	113	**103**	52	47	**143**	28	19	**183**	160	111
24	116	252	**64**	191	164	**104**	163	171	**144**	37	25	**184**	14	64
25	113	90	**65**	194	214	**105**	233	237	**145**	269	266	**185**	97	95
26	185	184	**66**	67	33	**106**	131	94	**146**	209	202	**186**	106	67
27	192	82	**67**	188	251	**107**	122	43	**147**	277	269	**187**	190	34
28	213	207	**68**	143	51	**108**	223	225	**148**	271	275	**188**	229	233
29	36	84	**69**	183	103	**109**	110	211	**149**	245	206	**189**	95	268
30	71	134	**70**	44	124	**110**	96	50	**150**	152	204	**190**	179	232
31	197	235	**71**	217	200	**111**	161	72	**151**	195	139	**191**	47	16
32	57	154	**72**	227	169	**112**	266	234	**152**	251	175	**192**	158	159
33	124	106	**73**	151	107	**113**	63	112	**153**	228	185	**193**	12	5
34	198	190	**74**	270	272	**114**	253	151	**154**	238	160	**194**	15	42
35	259	258	**75**	5	12	**115**	170	120	**155**	6	14	**195**	193	203
36	34	121	**76**	93	66	**116**	267	274	**156**	234	242	**196**	137	248
37	83	141	**77**	132	97	**117**	78	142	**157**	261	267	**197**	162	152
38	187	174	**78**	60	137	**118**	150	158	**158**	145	132	**198**	29	219
39	166	61	**79**	66	57	**119**	61	170	**159**	201	196	**199**	112	101
40	133	71	**80**	13	65	**120**	69	86	**160**	123	149	**200**	147	193

Table 2. Overall ranking results (cont.)

Candidate	Ranks from ARAS & minsum efficiency weights	Ranks from ARAS & entropy weights	Candidate	Ranks from ARAS & minsum efficiency weights	Ranks from ARAS & entropy weights
201	272	238	**241**	98	74
202	125	128	**242**	121	102
203	33	4	**243**	273	276
204	211	126	**244**	118	181
205	79	28	**245**	176	239
206	41	98	**246**	242	263
207	260	198	**247**	208	231
208	148	119	**248**	279	279
209	91	182	**249**	31	20
210	178	115	**250**	243	271
211	115	99	**251**	140	58
212	157	146	**252**	56	76
213	196	35	**253**	174	246
214	99	136	**254**	255	240
215	120	177	**255**	2	2
216	168	153	**256**	117	226
217	252	253	**257**	207	183
218	84	144	**258**	216	109
219	159	100	**259**	25	31
220	256	270	**260**	222	96
221	26	44	**261**	276	273
222	19	38	**262**	114	165
223	138	133	**263**	232	163
224	239	249	**264**	105	230
225	248	180	**265**	142	229
226	173	205	**266**	156	125
227	268	277	**267**	139	217
228	236	187	**268**	182	259
229	86	91	**269**	20	32
230	254	192	**270**	59	46
231	202	257	**271**	154	161
232	258	255	**272**	51	118
233	74	21	**273**	64	39
234	134	168	**274**	80	156
235	18	13	**275**	204	166
236	8	78	**276**	237	209
237	30	30	**277**	73	29
238	167	250	**278**	155	227
239	136	143	**279**	85	176
240	235	245			

Acknowledgements

This research has been financially supported by Galatasaray University Research Fund under Grant 19.402.011.

References

[1] Chien, C. F., & Chen, L. F. (2008). Data mining to improve personnel selection and enhance human capital: A case study in high-technology industry. *Expert Systems with Applications, 34*, 280–290.
[2] Karsak, E. E. (2001). Personnel Selection Using a Fuzzy MCDM Approach Based on Ideal and Anti-ideal Solutions. *Lecture Notes in Economics and Mathematical Systems, 507*, 393–402.
[3] Dursun M., & Karsak, E. E. (2010). A fuzzy MCDM approach for personnel selection. *Expert Systems with Applications, 37*, 4324–4330.
[4] Lin, H. T. (2010). Personnel selection using analytic network process and fuzzy data envelopment analysis approaches. *Computers and Industrial Engineering, 59*, 937–944.
[5] Warning, S. (2014). How to pick your staff? Using data envelopment analysis. *Management Research Review, 37*, 815–832.
[6] Taylan, O., Alidrisi, H., & Kabli, M. (2014). A multi-criteria decision-making approach that combines fuzzy topsis and DEA methodologies. *South African Journal of Industrial Engineering, 25*, 39–56.
[7] Zavadskas, E. K., & Podvezko V. (2016). Integrated determination of objective criteria weights in MCDM. *International Journal of Information Technology and Decision Making, 15*, 267–283.
[8] Saaty, T. L. (1977). A scaling method for priorities in hierarchical structures. *Journal of Mathematical Psychology, 15*, 234–281.
[9] Saaty, T. L. (2004). Decision making – the analytic hierarchy and network processes (AHP / ANP). *Journal of Systems Science and Systems Engineering, 13*, 1–35.
[10] Hwang, C. L., & Lin, M. J. (1987). *Group Decision Making under Multiple Criteria: Methods and Applications*. Berlin: Springer-Verlag.
[11] Keršuliene, V., Zavadskas, E. K., & Turskis, Z. (2011). Selection of rational dispute resolution method by applying new step-wise weight assessment ratio analysis (Swara). *Journal of Business Economics and Management, 11*, 243–258.
[12] Ginevicius, R. (2011). A new determining method for the criteria weights in multicriteria evaluation. *International Journal of Information Technology & Decision Making, 10*, 1067–1095.
[13] Shannon, C. E. (1948). A Mathematical Theory of Communication. *Bell System Technical Journal, 27*, 379–423.
[14] Srinivasan V., & Shocker, A. D. (1973). Linear programming techniques for multidimensional analysis of preferences. *Pyschometrika, 38*, 1973.
[15] Pekelman, D., & Sen, S. K. (1974). Mathematical programming models for the determination of attribute weights. *Management Science, 20*, 1217–1229.
[16] Karsak, E. E., & Goker, N. (2019). MCDM-DEA approach for personnel selection in the banking sector. *Proceedings of IAC in Vienna 2019*, Austria, 175-181.
[17] Zhu, Y., Tian, D., & Yan, F. (2020). Effectiveness of entropy weight method in decision-making. *Mathematical Problems in Engineering*, 1–5.
[18] Zavadskas, E. K., & Turskis, Z. (2010). A new additive ratio assessment (ARAS) method in multicriteria decision-making. *Technological and Economic Development of Economy, 16*, 159–172.
[19] Charnes, A., Cooper, W. W. & Rhodes, E. (1978). Measuring the efficiency of decision making units. *European Journal of Operational Research., 2*, 429–444.
[20] Karsak, E. E., & Ahiska, S. S. (2005). Practical common weight multi-criteria decision-making approach with an improved discriminating power for technology selection. *International Journal of Production Research, 43*, 1537 – 1554.
[21] Baykal, I.O. (2007). Application of multiple criteria decision making methods to the personnel selection problem. *Master's Thesis* (Advisor: Prof. E. E. Karsak), Graduate Institute of Science and Engineering, Galatasaray University.

The Influence of Circular Economics on Business Strategies

Lukáš BLAŽEK [a*]

VSFS University of Finance and Administration, Czech Republic, Prague
blazek.lukas@mail.vsfs.cz

Abstract

The growing consumption of materials and resources causes negative impacts and pressure on the environment. The Organization for Economic Co-operation and Development (OECD) has projected that global material consumption and associated environmental impacts will at least double between 2018 and 2060 in a no-action scenario. In order to reduce material consumption and offset the subsequent environmental impacts, stricter resource efficiency and circular economy measures are necessary throughout the value chain. Linear business models must be replaced by circular business models.The entry of companies into the circular economy will be one of the key areas of the transformation of the current economy. Currently, our economy is largely based on the production of short-lived products that end up in landfills at the end of their use. Valuable raw materials are thus lost on these products, while the extraction of new ones in turn produces emissions of greenhouse gases and smog from transport and production. That is why the circular economy, or the circular economy, is coming to the forefront of the interest of companies in Europe and around the world. The global dimension and opportunity for business is abundantly clear. All this will have a great influence on the applied strategic management of businesses and on the creation of new business models and relationships.

Keywords: Circular economy, linear economy, recycling, corporate social reponsibility, Cradle to Cradle, Sustainable Development

1. INTRODUCTION

Our current economic model is based on mining and waste. We take materials from the planet, make products from them, and eventually throw them away. In principle, this take-make-waste economic model cannot work in the long term. It relies on the extraction and eventual disposal of limited materials and – to meet the ever-increasing demand for resources – encroachment on natural ecosystems, resulting in greenhouse gas emissions and staggering biodiversity loss.

Only an economic system based on the recirculation of resources and the regeneration of natural systems offers a way forward that can work in the long term. This model, known as the circular economy, could help tackle the world's biggest challenges, such as climate change, biodiversity loss, waste and pollution. The circular economy is based on three principles - eliminate waste and pollution; maintain products and materials in service; and regenerate natural systems.

As organizations begin to make strides in their efforts to transition from a linear way of doing business and implement real-world change, clear and comparable metrics will be valuable for evaluating their success and planning future actions.

Jarkko Havas, Head of Insights and Analysis at the Ellen MacArthur Foundation, explains: “Implementing change can only be effective when we have a clear vision of the future state, an understanding of where we are now and an idea of how fast we are evolving. Measuring progress and tracking change is a crucial factor in the transition to a circular economy” (Woolven, 2021).

* Corresponding author.

It is important that we understand how to achieve a circular economy beyond the recirculation of materials. Upstream solutions such as product and service design are critical to eliminating waste before it happens. At an organizational level, we must also ensure that the circular economy is part of strategy, risk assessment and organizational objectives.

The impact of the circular economy on business strategies will be significant. However, every company must start by knowing its principles, advantages, but also possible limitations when switching to its operation. This article serves to clarify the importance of CE and its impact on the functioning of companies, especially in the market environment.

The transition from a linear economy to a circular economy is a long process, within which the company will certainly encounter a number of barriers, whether due to lack of information, technical or technological knowledge and possibilities, lack of capital or insufficiently supportive legislation, etc. With complicating situations businesses of all sizes in any industry and sector can face barriers in the form of barriers (Woolven, 2021).

2. SUSTAINABLE DEVELOPMENT

Earth's natural capital is diminishing as human consumption increases. However, Earth's ecosystems cannot provide us with enough resources to cover the costs needed to meet our future needs. In addition, a developed economy is based on the intensive use of natural resources and subsequent pollution, which often leads to the destruction of many ecosystems. According to the United Nations World Commission on Environment and Development, sustainable development is "development that meets the needs of the present generation without jeopardizing the ability to meet the needs of future generations" (Our common future, 1987).

The term need refers to the basic needs of the poorest inhabitants of the planet, which is a sufficient amount of food, drinking water, a quality environment, a basic level of medical and educational services. Concepts are defined within the framework of sustainable development, thanks to which we can limit the impact of human activity on the environment and thus reduce the so-called ecological footprint. These concepts are: “Renewable resources should be pumped at the maximum rate at which they can be renewed. Exhaustible resources should be drawn at the maximum speed at which their replacements will be built, to which it will be possible to switch smoothly. The intensity of pollution must not exceed the assimilation capacity of the environment. Part of the current technologies should be invested in reducing pollution, reducing wastage and increasing the efficiency of products, energy, production processes, etc." (Reday-Mulvey, Stahel, 1977).

It is necessary to mention some initial data McKinsey & Company has calculated that the adoption of the principles of the circular economy can generate annual savings in Europe worth 1.8 billion from 2030. euros and revenues of 600 billion euros per year. According to the European Commission, the circular economy should bring 2 million new jobs. The average European consumes 16 tonnes of material per year and only 5% of the value returns to the economic system. Individual EU member states are preparing for a gradual ban on the use of single-use plastic products and increasing the take-back of packaging materials up to 90%. There is no doubt about the benefits of recycling: the production of one ton of recycled plastic saves 5 barrels of oil and the equivalent of 1.6 tons of CO2 (Cirkulární Česko, 2021).

Sustainable development and circular economy

The circular economy is part of sustainable development. By applying their principles, it is possible to achieve some of the sustainable development goals they have in common. These are primarily goals such as clean water and air, climate protection, responsible consumption and production, economic growth, reduction of inequality and global cooperation. The circular economy shows the direction we can take and thus reach a sustainable world, where the needs of all people are met through renewable resources without polluting the environment, without the generation of waste, where things are shared, renewed, repaired, innovated and where nature is viewed as a model from which we can learn. At the same time, achieving a sustainable world does not require changes in the quality of life of consumers, nor does it cause a decrease or loss of income or additional costs for producers. Circular business models can be just as profitable and allow consumers to use similar products and services as those in linear models.

Principles of circular economy

Most economically developed countries try to adhere to the principles of sustainability, they strive for the longest possible life of materials and the renewal of materials instead of the extraction of new non-renewable raw materials. Along with this, they strive to reduce waste production, maintain a clean environment undisturbed by human

activity, and find inspiration in natural processes, which they further apply to industrial systems. The circular economy also adopted these principles (EMF, 2013). The "end-of-life" model of the linear economy is slowly being replaced by activities such as repair, reuse, reconstruction, renovation and recycling of materials, the use of renewable energy, the elimination of the use of toxic chemicals and waste through better designs of materials, products, systems and business models. In these cases, we talk about the circular economy.

No waste

The circular economy strives to minimize the generation of waste. Product design plays an essential role here. The product must be designed in such a way that it can be reused or returned to nature after the end of its useful life without negative impacts on the environment. It is necessary to limit single-use products. There is a law in the legislative process to limit the impact of selected plastic products on the environment. Activities in the area of the circular economy must be considerate not only of the environment, but also of people's health. If the generation of waste cannot be prevented or the waste cannot be recycled, in most cases recovering its energy content is preferable to landfilling, both from an environmental and economic point of view. "Energy from waste" can therefore play a role and create synergies with EU energy and climate policy, but must follow the principles of the EU waste hierarchy. In 2019, an average of 29% of municipal waste was used for energy in the EU (Communication of the Commission of the European Parliament, 2015).

Use of renewable resources

The energy needed to power the cycle should come from renewable sources. Solar, water, wind, geothermal energy or biofuels are suitable. The benefit of renewable energy sources lies primarily in their ability to reduce greenhouse gas emissions and the level of environmental pollution. Dependence on resources should be gradually reduced and, on the contrary, the resilience of the system should be increased.

Endurance

The 2015 EU Circular Economy Action Plan states that the circular economy aims to retain the value of products, materials and resources for as long as possible in the economic cycle and return them to the production cycle at the end of their life, while minimizes waste generation (Communication of the Commission of the European Parliament, 2015).

3. **THOUGHT TRENDS**

The general concept of the circular economy has been developing since the 1970s. It is based on the principles of several schools of thought, which in their publication Towards the Circular Economy Vol. 1: an economic and business rationale for an accelerated transition is being developed by the Ellen MacArthur Foundation.

Regenerative design

The founder of the idea of regenerative design was the American professor of landscape architecture John T. Lyle, who describes the concept as a theory based approach to product design. The goal he wants to achieve through processes such as restoration, reuse or extending the life of the product's material and energy is to create a society with intact nature. This, according to Lyle, makes it possible to create a sustainable system (EMF, 2020).

Performance economics

In 1976, Swiss architect and industrial analyst Walter Stahel outlined a vision of the loop economy. In his work The Potential for Substituting Manpower for Energy, addressed to the European Commission, he discusses its impact on job creation, economic competitiveness, resource saving and waste prevention. The performance economy pursues four main goals: extending product life, long product life, reconditioning activities and waste prevention. It also insists on a preference for selling services rather than products, i.e. renting goods (EMF, 2020).

Cradle to cradle

Michael Braungart, a German chemist and visionary, together with Bill McDough, an American architect, developed the Cradle to Cradle ™ concept and certification process. This philosophy considers all material as nutrients. Biological nutrients that are non-toxic and even beneficial to the environment can be safely returned to the biosphere. Technical nutrients, such as metals and most plastics, are unsuitable for the biosphere due to their burden and are therefore designed for reuse from the outset. The Cradle to Cradle concept considers biological ecosystems as models for technical ones (EMF, 2020).

Industrial ecology

Industrial ecology is the study of material and energy flows. Its international company is led by Professor Roland Clift at the Center for Environmental Strategy at the University of Surrey. This approach aims to create closed-loop processes where waste serves as an input, thereby eliminating an unwanted by-product. Industrial ecology designs production processes that are consistent with local ecological constraints while focusing on their global impact from the outset and trying to shape them to work as closely as possible to natural systems. With an emphasis on restoring natural capital, industrial ecology also focuses on social well-being and health (EMF, 2020).

Biomimetics

Janine Benyus, author of Biomimicry: Innovation Inspired by Nature, defines her approach as "a new discipline that studies nature's best ideas and then imitates those designs and processes to help solve humanity's problems." The concept of biomimicry is based on three key principles:

• Nature as a model: Studying natural models, processes and systems and then imitating them can help to develop a strategy for solving the problems associated with a linear economy.

• Nature as a benchmark: We can use the patterns we can see in nature to assess the sustainability of our innovations.

• Nature as a mentor: We should look to nature as a role model from whom we can gain and learn a lot. The opposite approach of viewing and evaluating only as a source of raw materials that we want to extract from it is not correct and particularly sustainable (EMF, 2020)..

Blue economy

The Blue Economy is an economic concept created by the Belgian visionary, economist and entrepreneur Günter Pauli. In 2010, he presented the Blue Economy in his book Blue Economy: 10 years, 100 innovations, 100 million jobs. He used this name to distinguish between the currently prevailing models called the Red Economy, a dominant business model based on borrowing, debt growth, unlimited resource extraction and pushing problems into the future, and the Green Economy, which is based on equipping the economy with green technologies that are but financially demanding. The blue economy is a business model based on imitating nature, reuse of materials, nutrients and energy, zero waste production and local job creation. "100 innovations representing the basis of the Blue Economy allow the creation of 100 million jobs worldwide in 10 years" (Paulim, 2010).

Natural capitalism

In their book Natural Capitalism: Creating the Next Industrial Revolution, Paul Hawken, Amory Lovins, and L. Hunter Lovins describe a global economy in which business interests collide with environmental interests. It recognizes the interdependence between the production and use of man-made capital and the flows of natural capital (soil, air, water and all living organisms). Natural capitalism promotes the principle of increasing the efficiency of natural resources, the transition to nature-inspired production models and materials, and investment in natural capital (Schools of Thought, 2018).

As part of the strategic management of the company, it is necessary to focus on the following 3 main pillars:

1) Sharing of current information, examples of good practice and experiences of members

2) Informing members about circular economy topics using knowledge and its network of experts

3) Connections within an active community that will enable the creation of new projects and provide unique opportunities for its members

4. EU CIRCULAR ECONOMY STRATEGY

The European Union has a great influence on the development of new economic models. Its policy is primarily aimed at supporting sustainable development, and therefore also supporting the circular economy. Along with the efficient management of resources, it became one of its main priorities in the following years. One of the first mentions of the circular economy appeared in December 2015, when the European Commission published a circular economy package. It was and still is to facilitate the transition from a linear to a circular economy for European business entities and consumers. The Commission also expects significant financial support for these entities. Plastic is one of the most used materials today. It is used for the creation of packaging, insulation, products for the automotive or aerospace industry, in agriculture, cosmetics, medicine and other industries. Until now, plastic products have become waste at the end of their useful life. However, such a trend remains unsustainable and is rapidly receding. On average, EU residents produce around 25.8 million tonnes of plastic waste. Less than 30% is collected for recycling, one-third goes to landfill and 39% goes to incinerators. Although the number of landfills has

decreased over the past decade, incineration is increasing. Demand for recycled plastics is currently low in Europe, accounting for only about 6% of plastic demand. Therefore, most of the sorted plastic is exported for processing to 10 countries outside the European Union. The biggest problem is the huge pollution of the waters of the seas and oceans with plastic waste. Between 150,000 and 500,000 tons of plastic enter the oceans every year from the countries of the European Union. Therefore, the European Commission has prepared a basic vision of a new perspective on plastics in the circular economy, which will deal with plastics throughout their entire life cycle. The result is the Strategy for Plastics, which aims to specialize in the production and use of plastics, so that plastic products preserve the principles of the circular economy from the very beginning. All plastics used are to be either reusable or recyclable by 2030. Recycling will also contribute to the reduction of greenhouse gas emissions and reduce the dependence of the countries of the European Union on the import of fossil fuels (Communication from the Commission to the European Parliament, 2018).

5. IMPACTS ON BUSINESSES

In order for companies to behave circularly, they need to change their thinking already when designing products. In a circular economy, ideally there is no waste, but innovative solutions are created that support not only economic development, but also society and the environment. In practice, this means focusing on the durability of products, their reuse, refurbishing or recycling, so that products, components and materials remain in a never-ending cycle and do not become waste. There is also a need to effectively separate natural and technical cycles. In natural cycles, we work with materials that nature can process, as they decompose over time and supply the necessary nutrients back to the earth. In technological cycles, on the other hand, materials circulate that nature cannot deal with. They are, for example, plastics, metals or synthetic chemicals that need to be kept in a constant cycle and learned to reuse them. Within the framework of the sharing economy, businesses are beginning to realize that diversification is key for them, and therefore a number of successful ideas based on the principles of the sharing economy can be developed widely. An example is Uber and its services UberEats (food delivery) or UberPool (carpooling). Companies can thus secure not only new sources of income, but also stabilize their income through diversification (Sharing Economy, 2022).

However, it is absolutely necessary to carefully prevent the undesirable consequences of the rapid expansion of business models based on the sharing of certain things (e.g. sidewalks and crowded with stored shared electric bicycles and electric scooters) (Strategic framework CE CR 2040, 2022).

One way to overcome these problems is through regulation and supervision. The European Commission is also aware of the importance and potential of the sharing economy, which recommends to member states, albeit in the form of a soft legislative instrument, to support the sharing economy sector while maintaining adequate consumer protection. Because the boom of the shared economy can put pressure on traditional providers to improve the quality of the services provided (Sdílená ekonomika, 2022).

The EU is not the only one dealing with the negatives of the linear economy. Currently, for example, the Chinese concept of circular economy follows these 4 approaches:

1. Circular production - the so-called 3R - from the English "Reduction, Reuse, Recycle" = "reduction, reuse, recycling". The government plans to systematically introduce this principle into the entire production process.
2. circular system of industry, agriculture and services – economic sectors are guided by the principle of optimization of industrial processes, significant support for circular production.
3. Development of the recycling industry - recycle and reuse urban waste, focusing on remanufacturing and renewable energy sources.
4. Green consumption - leading citizens to smart, healthy and safe consumption.

6. THE INFLUENCE OF THE CIRCULAR ECONOMY ON THE BUSINESS STRATEGIES OF SELECTED GLOBAL LEADERS

Manifestations of the inclusion of the circular economy (product sustainability, product life) can be identified in the activities of an increasing number of leaders in their field (e.g., Renault, IKEA, Volvo).

6.1. Renault and new factories

The use of circular principles can bring not only savings but also profits in production. And we are certainly not talking about small numbers. Proof of this is the car company Renault, which reduced energy and water consumption by 85% by using and repairing old parts. As a result of material and energy savings, Renault has been

able to offer its customers a product of the same quality that is 30-50% cheaper. Furthermore, Renault is preparing to open a new circular factory in the town of Flyns. By 2030, more than 3,000 people will find employment here. Renault is trying to become a role model in the circular economy. This plant, with the goal of reducing CO2 to zero in 2030, is an integral part of the group's overall strategy combining the circular economy, reducing emissions, developing competences and creating new value-generating activities (Renault, 2020).

The factory will be divided into 4 centers

1. RE-TROFIT: All activities allowing to extend the life of vehicles and the length of their use are concentrated here. Work will also be done here to convert vehicles with internal combustion engines to other energies with less carbon consumption, and a department for the production of little-used parts on 3D printers will be created.
2. RE-ENERGY: This center intends to advance the potential of applications resulting from electric batteries and new energies into the field of production
3. RE-CYCLE: The task is to increase the proportion of recycled and reused materials in manufactured models. A line for dismantling vehicles that have ceased to be used will also be installed here.
4. RE-START: It is here that research and development should take place in connection with the above-mentioned fields of activity. A university and educational center will also function here.

6.2. Changing IKEA's strategy for sustainability

As stated in IKEA's Sustainability Strategy called People & Planet Positive “We need to transform the way we work from a linear one to a circular one that not only uses but also renews resources. Because we are a society dependent on natural resources and people, we must, among other things, take care of the future of the IKEA business, the IKEA value chain and the livelihood of the millions of people who are part of it" (IKEA Strategy, 2018).

To transform into a circular society

We will extend the life of products and materials and use resources more intelligently. We turn waste into raw material. We will not take any waste to landfills. We will take a leading role in transforming secondary raw materials (i.e. reused and recycled materials) into clean and safe resources. We will source and manufacture renewable and recycled materials that have a positive impact on the environment. We will introduce and promote systems and services enabling a circular economy.

Benefit the climate

We will significantly reduce the absolute amount of greenhouse gases to help limit the global temperature rise to well below 2°C by the end of the century, ideally to 1.5°C. Compared to the 2016 business year, we will reduce the absolute amount of greenhouse gas emissions created in the IKEA value chain. We mean the footprint left by materials, food, transport services, production at suppliers and the use of IKEA products in customers' homes13. We will strive for IKEA stores to use electricity and heat exclusively from renewable sources14. We will promote the production of renewable energy and the installation of new equipment at workplaces. We will actively reduce the amount of air pollutants. We will design, build, operate and manage all our buildings individually with local conditions in mind, so as not to exceed the limits of the planet.

Regenerate resources, protect ecosystems and improve biodiversity

We will continue to secure and develop standards for the responsible sourcing of raw materials based on environmental, social and animal protection criteria. We will benefit forests: promote sustainable forest management without forest degradation and deforestation. We will manage, protect, restore and regenerate forests using innovative procedures. We will lead projects focused on the restoration of degraded land, deforested areas and cultivated agricultural areas. We will benefit water: manage and develop water management programs. We will take the lead in projects focused on the restoration and rehabilitation of polluted waters and the protection of biological diversity. In particular, we will focus on leading projects that will ensure that the oceans are cleaned of plastic pollution. We will procure wood, cotton, food and other raw materials from "more sustainable sources".

As a specific project, we can mention - IKEA - the second life of furniture IKEA is one of the first on the market to come up with the spirit of the circular economy with the "second life of furniture" project. The IKEA chain offers a guaranteed purchase of children's furniture, as they realize that the life of the furniture is much longer than the time the customer uses the furniture. The user automatically receives this guarantee when he buys a qualifying

product and uses the IKEA Family membership card. The warranty is valid for two years and offers three purchase price levels depending on the period of ownership by the customer. The used furniture is then sold in the IKEA "corner" to another customer at a reduced price after inspection. With this guarantee, the retail chain supports the circular economy and gives customers space for a simple environmental solution for children's furniture that is no longer needed (IKEA, 2017).

6.3. Volvo Cars

Volvo Cars has decided to use the principles of the circular economy to save one billion Swedish kronor annually from 2025, while reducing the amount of carbon emissions produced by 2.5 million tons. The aforementioned decision supports the automaker's long-term goal of becoming a circular society by 2040, with a circulation loop created for high-emission materials such as steel and aluminum (Volvo Cars, 2021).

This closed cycle will be largely based on remanufacturing, repair, reuse and renovation of individual parts. "Volvo Cars has presented one of the most ambitious climate plans in the automotive industry. In order to achieve our goals, we need to use the circular economy," said Anders Kärrberg, director of global sustainability at Volvo Cars. “For that reason, everything we do needs to be re-evaluated, including the way we do it. That is why we place a strong emphasis on integrating sustainability into the way we think and work within our company, making sustainability as important to us as safety has always been.”

To become a circular economy company by 2040, every component for our cars needs to be designed, engineered and manufactured for reuse either directly by our company or by our suppliers.

The company wants to optimize the use of materials, parts and cars for as long as possible, emphasizing the efficient management of resources and maintaining the value of materials and resulting parts for as long as possible, while at the same time minimizing the amount of waste generated within the production process. This will simultaneously lead to financial savings and the creation of new sources of income, while significantly reducing the company's impact on the environment.

Volvo Cars is already remanufacturing components such as transmissions and engines, thanks to which it manages to make better use of materials and reduce the amount of emissions produced. In 2020, approximately 40,000 components were refurbished, reducing the amount of CO2 emissions produced by almost three thousand tons. In 2025, Volvo Cars intends to more than double the number of refurbished parts. To ensure that valuable material remains in circulation, it recycled 95% of its production waste last year. This included 176,000 tons of steel, which prevented nearly 640,000 tons of CO2 emissions (Volvo Cars, 2021).

In 2020, Volvo Cars became a member of the Ellen Fondation MacArthur, one of the world's leading networks supporting the circular economy. “We very much welcome Volvo Cars' commitment to design, develop and manufacture its products to be suitable for reuse. Seeing the connection between the circular economy, business strategy and carbon reduction is very encouraging,” said Joe Murphy, head of the Ellen MacArthur Foundation network. "The circular economy offers businesses a framework for viable long-term growth that simultaneously benefits human society and the environment."

From the perspective of the circular economy, new business models are important in which batteries for electric vehicles, for example, get a chance for a second life cycle. By using accumulators as energy storage outside vehicles, a new inflow of funds can be obtained, costs can be reduced and at the same time the life cycle of accumulators can be extended.

Volvo Cars, in cooperation with its suppliers, is investigating the potential of high-voltage batteries for use within their second life cycle. One of the current examples is the cooperation with the company BatteryLoop, belonging to the Swedish Stena Recycling Group, which uses batteries from the automotive industry.

BatteryLoop and Volvo Cars are using batteries from electrified Volvo cars to create a solar energy storage system. Starting in April, the said system will serve as a source of energy in charging stations for electrified vehicles and electric bicycles at the shopping center of Essity, a hygiene and health products company located outside Gothenburg.

There is also a similar pilot business project in which companies such as Comsys AB (a Swedish technology company) and Fortum (a European energy company) have also been involved with Volvo Cars. The goal of the project is to increase the flexibility of deliveries to one of Fortum's Swedish hydropower plants and at the same time contribute to the secondary use of batteries from electric cars.

The battery systems from Volvo's plug-in hybrid cars will serve as static energy storage, helping to supply the electrical system with energy for so-called quick equalization. Through the above and a number of other projects, Volvo Cars is investigating the aging process of batteries in their second life cycle, which is considerably less demanding compared to their operation in a car. In addition, the mentioned projects of the car company make it

possible to obtain information about the commercial value of accumulators after the end of their car cycle and to identify potential sources of income (Volvo Cars, 2021).

7. THE PRINCIPLE OF CIRCULARITY IN PRODUCTION PROCESSES

The principle of circularity is a necessary part of the wider transformation of industry towards climate neutrality and long-term competitiveness. It can deliver significant material savings in value chains and production processes, create added value and provide economic opportunities. In line with the objectives set out in the industrial strategy16, the Commission will enable a wider application of the principle of circularity in industry through the following measures (COM-102, 2020):

- assessment of the possibilities of further support of circularity in industrial processes in connection with the revision of the directive on industrial emissions, including the inclusion of circular economy procedures in the prepared reference documents on the best available techniques, (EP Directive, 2010)
- facilitating industrial symbiosis by creating an industry-led reporting and certification system and enabling industrial symbiosis,
- supporting a sustainable and circular biotechnological sector by implementing the Bioeconomy Action Plan (COM-673, 2018),
- supporting the use of digital technologies for locating, tracking and mapping resources,
- supporting the introduction of green technologies through a reliable verification system by registering the European Environmental Technology Verification System as an EU certification trademark.

The new strategy for SMEs19 will promote circular industrial cooperation between SMEs, based on training and advice within the Enterprise Europe Network on cooperation between clusters, as well as knowledge transfer through the European Knowledge Center for Resource Efficiency (COM- 103. 2020).

8. MEASURING THE CIRCULAR ECONOMY TRANSITION FOR BUSINESSES

Measuring financial results, customer retention, productivity and inventory are commonplace, but these measurements alone are no longer enough to tell a business whether it will stand the test of time. It's becoming increasingly clear that businesses must consider their social and environmental impact to succeed – or be caught off guard by changing legislation or abandoned by customers. What could previously be simply written off as a "negative externality" now has financial implications and must be central to business strategies. This means changing the way businesses see their role in society and ultimately transforming the economy (Woolven, 2021).

Business managers, therefore, need access to data that measures their business's circular economy performance, alongside the more common metrics used to evaluate business, to understand whether a business is achieving its circular economy goals.

However, circular economy performance measurement is a relatively new field, which can lead to a misinterpretation of the circular economy, resulting in well-intentioned incremental improvements to linear systems rather than the adoption of truly circular business models. The concept of circular economy and its meaning for businesses has been interpreted in many ways. As a result, the standardization of circular economy concepts and their incorporation into broader non-financial reporting standards are areas of ongoing work. Measuring circular economy performance also requires data on areas of business that have not traditionally been measured, such as water circulation or physical assets.

Advantages of circular economy measurement

Access to metrics to assess a company's performance in a circular economy can have a number of benefits, both for individual companies themselves and for the overall transition to a circular economy. Sizing a company's circular economy performance can be a motivating force for faster and fuller adoption of the circular economy. It can strengthen strategic decision-making, help companies fully realize the opportunities of the circular economy and can help drive sustainable progress.

If data on the performance of circular economy companies is made publicly available, it can also help accelerate the broader transition to a circular economy by providing the financial world with a metric to base investment decisions on. As the circular economy is a complex and multifaceted system, deciding whether a company is 'circular' or not can be complicated for investors without clear, consistent and comparable metrics (Woolven, 2021).

In order to measure the performance of the circular economy, it is important to evaluate the concrete results of the company's efforts to transition to a circular economy - to create a picture of the current circulation of the company in terms of material flows and business models. But it's also important to look at the things that enable the

transition, such as senior management buy-in and the necessary infrastructure – this gives insight into the circular economy potential of companies.

9. SUGGESTIONS AND RECOMMENDATIONS

In recent years, we have observed a tendency to promote and subsequently introduce changes in the political and legislative environment, primarily in the European and American markets, which enforce higher demands on production processes from the point of view of environmental protection and the quality of finished goods and services in terms of their safety for human health. Currently, there are already many political, legislative and economic instruments that stimulate the shift of legal entities towards the circular economy and thereby achieve a reduction in the number and intensity of negative externalities as side effects of business. The tax systems in most European states and the United States of America provide benefits for legal entities that do business in accordance with the principles of the circular economy and, conversely, place a higher tax burden on entities that still operate in the linear economy. Legislative restrictions and prohibitions minimize the risk of environmental pollution or negative impact on human health, for example by compiling a list of prohibited substances and materials, chemical compounds that have been proven to be toxic. This list is constantly being expanded and supplemented. Subsidy and subsidy programs approved and launched by the regulatory authorities and financial funds of the European Union and the United States of America support the transition of primarily manufacturing companies from the linear economy to the circular economy and provide significant financial resources to companies that have decided to take this step.

Despite the fact that it is currently impossible to estimate how long it will take and in what exact way the transformation of a linear economy into a circular economy will take place and when there will be a period of strict prohibition of gainful activity with any, even minimal, negative impact on the environment and human health , it can be argued that the direction of economic development is definitive and irreversible.

Although the primary goal of companies is the creation of economic profit and an increase in their value, the main condition is the ability of the company to remain and survive on the market. In the long term, it is therefore absolutely necessary for the company's survival to introduce changes in business management that will lead to a gradual transition towards a circular economy. These changes require significant financial investments in innovation and research, the introduction of new production technologies and a different approach in human resource management. However, as can be seen from the results of the research part of this bachelor's thesis, the investment pays off and brings competitive advantages that translate into an increase in the company's financial income. Current subsidy and subsidy programs allow covering a significant part of spent investments from state funds, if the intentions of investment projects meet the requirements and are aimed at reducing/eliminating the occurrence of negative externalities as a result of business.

State and private institutions and organizations focused on providing services and advice in the field of environmentally and health-friendly business, such as EPEA, MBDC, local and international councils for sustainable construction, Ellen MacArthur Foundation, European Environmental Bureau, Institute for Ecopolitics, World Health Organization, Greenpeace and many others, make it possible to eliminate the lack of knowledge and experience of individual manufacturing companies in the field of green production and help these manufacturing companies to effectively transition to a circular economy with minimal costs and low risk of failure. The above-mentioned institutions and organizations have many years of experience in the field of circular economy and the implementation of circular economy principles in practice.

10. CONCLUSION

The circular economy is part of sustainable development. By applying their principles, it is possible to achieve some of the sustainable development goals they have in common. These are primarily goals such as clean water and air, climate protection, responsible consumption and production, economic growth, reduction of inequality and global cooperation. The circular economy shows the direction we can take and thus reach a sustainable world, where the needs of all people are met through renewable resources without polluting the environment, without the generation of waste, where things are shared, renewed, repaired, innovated and where nature is viewed as a model from which we can learn. At the same time, achieving a sustainable world does not require changes in the quality of life of consumers, nor does it cause a decrease or loss of income or additional costs for producers. Circular business models can be just as profitable and allow consumers to use similar products and services as those in linear models. Sustainable development is currently one of the main priorities and part of the national strategic documents of all EU countries. Therefore, the circular economy also plays an important role in this, as it tries to reduce the negative

impact on the environment. This is a completely new application of management. But everything must start at secondary and then universities, where it will be necessary to guarantee new subjects and teach the functioning of this new economic model. The focus of the curriculum must correspond to the current needs of sustainable growth, which affects all areas of national economies. Subsequently, it will also be transferred to business management, new strategies will be applied, different from the traditional concept of business in the context of the synergy of supplier-customer chains.

References

[1] CIRCULAR Czechia, Circular economy as an opportunity for successful innovations of Czech companies, 2021, Available At: https://incien.org/wp-content/uploads/2021/06/Cirkularni-Cesko-priklady-uspesnych-ceskych-projektu.pdf

[2] COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS A sustainable Bioeconomy for Europe: Strengthening the connection between economy, society and the environment, COM/2018/673 final, Available At : https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52018DC0673

[3] COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS An SME Strategy for a sustainable and digital Europe, COM/2020/103 final, Available At: https://eur- lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2020%3A103%3AFIN

[4] COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE EUROPEAN COUNCIL, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS A New Industrial Strategy for Europe, COM/2020/102 final, Available At: https://eur -lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52020DC0102

[5] EMF. Towards the Circular Economy Vol. 1: an economic and business rationale for an accelerated transition [online], 2013, pp. 23-29 [cit. 2020-04-04]. Own translation. Available At: https://www.ellenmacarthurfoundation.org/publications/towards-thecircular-economy-vol-1-an-economicandbusiness-rationale-for-an-acceleratedtransition

[6] IKEA: information about the Second Life of Furniture project www.druhyzivotnabytku.cz Available At: (VIDEO: www.youtube.com/watch?v=FGNoNy5gxp8), 2017

[7] Our common future. New York: Oxford University Press, 1987. ISBN 0192820808.

[8] Renault is planning a new type of factory: It will give cars a second life [online]. Prague, 2020 [cit. 2022-04-04]. Available At: https://automix.denik.cz/magazin/renault-chysta-tovarnu-noveho-typu-bude-v-nidavat-autum-druhy-zivot-20201128.html

[9] COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS: Closing the loop - an EU action plan for a circular economy [online]. Brussels, 2015, 2.12.2015, p.3 [cit. 2022-04-04]. Available At: https://eurlex.europa.eu/legal-content/CS/TXT/HTML/?uri=CELEX:52015DC0614&from=EN

[10] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: European Strategy for Plastics in the Circular Economy [online]. Strasbourg: European Commission, General Secretariat, 2018, p. 6 [cit. 2020-04-04]. Available At:: https://eur-lex.europa.eu/resource.html?uri=cellar:2df5d1d2-fac7-11e7-b8f5-01aa75ed71a1.0014.02/DOC_1&format=PDF

[11] The Sharing Economy [online]. In: . p. 28 [cit. 2022-03-28]. Available At: https://www2.deloitte.com/content/dam/Deloitte/cz/Documents/deloitte-analytics/Sdilena-ekonomika.pdf

[12] Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control) Text with EEA relevance Available At: https://eur-lex.europa.eu/legal-content/ cs/TXT/?uri=CELEX%3A32010L0075

[13] Schools of Thought [online]. Ellen MacArthur Foundation [cit. 2018-08-14]. Own translation. Available At: https://www.ellenmacarthurfoundation.org/circulareconomy/schools-of-thought/natural-capitalism

[14] IKEA STRATEGY FOR SUSTAINABILITY – PEOPLE & PLANET POSITIVE - © Inter IKEA Systems B.V. 2018

[15] STRATEGIC FRAMEWORK OF THE CIRCULAR ECONOMY OF THE CZECH REPUBLIC 2040 [online]. In: . p. 160 [cit. 2022-03-28]. Available At: https://www.mzp.cz/C1257458002F0DC7/cz/news_20211213_Vlada-schvalilaCirkularni_Cesko_2040/$FILE/Cirkul%C3%A1rn%C3%AD%20%C4%8Cesko_2040_web.pdf

[16] Press release - Volvo Cars plans to reduce CO2 emissions and save billions through the circular economy [cit. 2021-04-21] Available At: http://www.volvodirect.cz/news/2021-04-21-circularni-ekonomika-volvo.pdf

[17] Towards the Circular Economy Vol. 1: an economic and business rationale for an accelerated transition is being developed by the Ellen MacArthur Foundation.

[18] WOOLVEN, J.: Why data and measurement are key to a circular economy transition. Editor, Ellen MacArthur Foundation on July 16, 2021, Available At: https://ellenmacarthurfoundation.org/articles/a-new-measure-of-business-success

Crypto Coins and Accounting

Mustafa AY[a*], Gülçin ADIYAMAN

[a] *author's affiliation and contact (eg Selçuk University , Faculty of Economics and Administrative Sciences, Department of Business, Konya, Turkey, may@selcuk.edu.tr)*
[b] *author's affiliation and contact (eg Selçuk University , Faculty of Economics and Administrative Sciences, Department of Business, glcnadymnn@hotmail.com)*

Abstract

Cryptocurrencies emerge as the most important product of independent finance thinking. Cryptocurrencies are managed in a virtual environment independently of intermediary institutions / organizations and a central authority. These coins can be used instead of existing currencies, can be a medium of exchange, can be bought or sold, can be produced by mining, and can be used as an investment tool. With the effect of globalization, the international spread of cryptocurrencies has become easier and has started to be used in almost every country. Recently, with the countries and large companies starting to invest in crypto money, the issue of how to account for crypto money has started to gain importance. While transactions such as mining cryptocurrencies, trading through exchanges, using it as a commercial good or service tool, and offering to the public, how these transactions will be accounted for has not yet been regulated. The biggest reason why legal regulations have not been made yet is due to the fact that countries do not consider cryptos as electronic currency. The aim of this study is to record in which account class and how crypto money transactions will be recorded in terms of accounting practices in Turkey. In this context, it has been explained and discussed how cryptocurrencies should be registered as cash, securities or commodities. This document gives formatting instructions for authors preparing papers for publication.

Keywords: Cryptocurrencies, Accounting, Bitcoin, Altcoins

1. INTRODUCTION

From past to present, barter, gold, silver, paper and coins, credit cards etc. vehicles have been used as means of payment. However, with the increasing technology and globalization, there has been a change in demands and needs. Individuals have started to use virtual currencies, or cryptocurrencies, in addition to digital currency, to save time and cost. In this way, individuals perform their transactions more transparently, reliably, quickly, easily, without the need for extra documents. Cryptocurrencies are suitable for daily life as they can be used as a store of value, unit of account and medium of exchange. The fact that cryptocurrencies are suitable for and facilitate the daily life of individuals means that we can use them at every stage of our lives. Bitcoin and others (Altcoins), the most popular, emerged against the transaction commissions of banks and the authority in the money market. Bitcoin (BTC), which has a production of about 21 million, is gaining in value because it is limited in number. Altcoins with different purposes, on the other hand, claim that each has a better project than the others. Thanks to crypto coins, individuals can transfer money quickly without the need for extra costs in a shorter time. Any person, institution, organization, business, etc. Cryptocurrencies, which are unknown or not, are seen anonymously. Since some of the cryptocurrencies are connected to the center, there is state intervention, while there is no intervention in some of them.

One of today's curious topics is how to record the cryptocurrencies that are widely used in daily life. In this context, the aim of the study is to investigate and discuss how, in what form and according to which class the crypto money registration will be recorded as cash and securities in Turkey. The general survey method was used as the research model and a detailed literature review was made. In the research, applications within the scope of Turkish Accounting Standards are included and possible accounting records of cryptocurrencies are explained with the help of examples.

* Corresponding author.

1.1. Cryptocurrency?

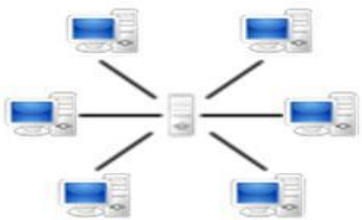
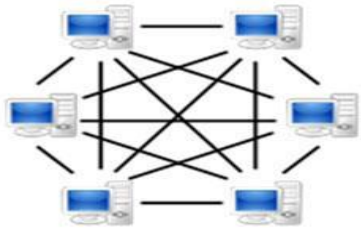
Technological development and the increase in globalization have changed the demands and needs of the society in terms of buying and selling. This situation has revealed digital currencies as well as barter, gold, silver, coins and paper money, which have been used from past to present. Although individuals had a problem of trust in the digital currency at first, they easily got used to it and adopted it with the comfort it gave over time. Thanks to the digital currency, individuals have started to make their own shopping transactions at any place or time. This situation has played an important role in businesses, institutions/organizations as well as daily transactions. In addition, with the increasing digitalization, education, health, finance, trade, etc. Time and cost savings were achieved by making transactions in a more reliable, fast and transparent manner in areas.

In 2008, besides digital currencies, virtual currencies, in other words cryptocurrencies, emerged. In the emergence of the crypto currency, the decline in the stock as a result of the global crisis experienced given year, the negativities in the banking sector, etc. The effects of circumstances are enormous. These negativities have negatively affected the confidence of individuals in the financial sector. In the face of this situation, alternative searches have been started in order to restore trust. Thus, the basis of the legal use of digital money was formed and cryptocurrencies began to be used (Şenbayram, 2019, s. 75). Cryptocurrency transactions can be bank, business, person, institution / organization, etc. It takes place at no cost, without the need for a third party. Cryptocurrency transactions have taken place in the computer environment and are shaped by supply and demand (Low ve Teo, 2017). Transactions made in the said currency, which is not connected to any center, are recorded from the first to the last transaction. Therefore, there is no manipulation or loss of transactions. Monetary functioning has changed with the use of paper money, digital money and cryptocurrencies. Individuals have sought to increase the use of digital and crypto money by reducing the use of paper money to the maximum (Tunçel, vd., 2021, s. 68). When it comes to crypto money, Bitcoin comes with the highest volume and the most popular. Bitcoin is a decentralized or individualized currency created by Satoshi Nakamoto. Nakamoto's any person, institution / organization, business, etc. It is considered anonymous as it is unknown whether it is available or not. With Bitcoin being successful and popular, nearly 1300 Altcoin types have emerged. Since altcoins have different projects, each one argues that it has a better project than the other. Altcoins can be converted to bitcoin at any time, regardless of place or time. Bitcoin is widely use in some countries such as Germany, Canada, USA, France, Japan. As a result of being suitable for daily use, the first ATM in the world was made in Canada. Later, other countries followed and the first Bitcoin ATM in Turkey was opened at Istanbul Atatürk Airport (Turan, 2018, s. 3).

In order for Bitcoin to be used as a means of buying, selling, investing and exchange, a Blockchain (Blockchain) must be created. The purpose of Blockchain, known as the distributed ledger, is to reach the ideal currency. Intellectual property, resume, identity and personal information, etc. The main goal of Blockchain is to carry out transactions that are important for individuals without the need for any official institution / organization without commission (Mainelli, 2017, s. 3). The verification of blockchain transactions is done by miners. Miners with powerful hardware and software follow the cryptocurrency market up-to-date. Miners who perform decryption can generate crypto money regardless of place and time. Blockchain technology operation is given in Tables 1.

1.2. Tables

Table 1. Server and Peer-to-Peer Systems

A **server** based network	A **peer-to-peer** based network.
	

As can be seen in Figure 1 for server operations based on network connection, all transactions take place from a single center; In the peer-to-peer blockchain system of the network connection, all users are included in the system.

The fact that all transactions are encrypted, increases the reliability of the blockchain system. Widespread use of blockchain technology, providing technological solutions to businesses, and contributing to the audit and accounting of infrastructure have been at the forefront. In other words, it is thought that Blokchain, known as the ledger, can replace the traditional accounting record system, as it can make the accounting record easily and confidentially (Özdoğan, Karğın, 2018, s. 168). Blockchain technology has many advantages such as reducing the cost of the transaction, increasing the quality of service, speed, reliability and transparency. However, it is still in the development stage, it is doubtful to reach the targeted effective level in terms of performance, there is a legal gap because it is not supported by the state, and there are deficiencies in measuring the real cost due to the absence of intermediaries (Özdoğan, Karğın, 2018, s. 171).All tables should be numbered with Arabic numerals. Headings should be placed above tables, left justified. Leave one line space between the heading and the table. Only horizontal lines should be used within a table, to distinguish the column headings from the body of the table, and immediately above and below the table. Tables must be embedded into the text and not supplied separately. Below is an example which authors may find useful.

2. ACCOUNTING OF CRYPTOCURRENCIES

Accounting is responsible for performing crypto money transactions in a complete and impartial manner, like every transaction made within the scope of the conceptual framework. Every cryptocurrency transaction made must be recorded (Raiborn and Sivitanides, 2015, s. 33). Although there are legal regulations for cryptocurrencies in some countries, there is no regulation in our country yet. It has been a matter of debate how to classify and account for cryptocurrencies, which are seen as money and securities and produced by mining. Although it is not clear how cryptocurrencies will be accounted for, predictions are made within the framework of the Accounting System Implementation General Communiqué and Tax laws. Accounting for cryptocurrencies varies depending on how they are used (Örten vd., 2014, s. 331).

When cryptocurrencies are evaluated as money, they are first converted into local currency in accordance with the concept of priority of substance. When cryptocurrencies are considered as a payment tool, sub-accounts such as crypto money safes can be opened under the roof of "10 Liquid Assets". Whether Bitcoin is bought against the goods sold in commercial relations or directly from the stock market, the crypto money obtained is recorded as a "Bitcoin Vault" under the "100 Cash" account like foreign currency. Bitcoin is credited until it is sold, but is calculated at the current exchange rate when it is sold. Accounting records are made on the basis of "646 Foreign Exchange Gain" or "656 Foreign Exchange Losses" accounts in the exchange rate increase or decrease in foreign currencies (Doğan vd., 2018, s. 32). Expenses incurred during the buying / selling of cryptocurrencies by transfer “653 Commission Expenses Account” In the event that the opposite commission is received, it is recorded in the “643 Commission Income” account. Article 289 of the TPL is taken into account in the said transactions. There is no VAT as cryptocurrencies are considered money (Kızıl, vd., 2019, s. 133).

Securities are negotiable instruments that are traded as investment instruments that offer credit or partnership rights in the medium and long term. Therefore, it is not very correct to think of cryptocurrencies as securities. However, if the combined cryptocurrencies acquire an asset-backed security, “Marketable Securities” can be called. In other words, the shares in which the cryptocurrency is included can be considered as securities. There are many different studies on whether cryptocurrencies can be considered as securities. Possible accounting entry of cryptocurrencies that do not have a clear equivalent as securities “118 Other Marketable Securities” It is located in the sub-account within the main account. While the profit generated during the trading transactions is recorded in the “645 Gains on Marketable Securities Sales” account, the losses to occur are recorded in the “655 Losses on Marketable Securities Sales” account (Kızıl vd.,2019, s. 130). Stocks are issued in foreign currency and evaluated with their purchase price, and different applications occur when the "purchase price" issue is not clear. If the purchase price is accepted as the “cost value”, the securities issued in foreign currency are evaluated at the exchange rate at the time of purchase. However, this situation poses a problem as the Central Bank of the Republic of Turkey (CBRT) does not make any regulation regarding the buying and selling of cryptocurrencies (Gümüş vd., 2018, 168). The accounting record foreseen in the evaluation of crypto money as "Money" and "Marketable Securities" is given below.

Example:

On 10.06.2020, the business purchases 2 Bitcoin 10 Ethereum and makes the payment transfer from the business bank account in order to evaluate its resource. The enterprise sold 1 BTC and 5 Etherium on 20.08.2020 and converted them into Turkish Lira. As of 31.12.2020, he valued 1 Bitcoin and 5 Ethereum in his possession.

1 Bitcoin on 10.06.2020: 50,000 TL

1 Bitcoin on 20.08.2020: 60.000 TL

1 Bitcoin on 31.12.2020: 70.000 TL

1 Ethereum on 10.06.2020: 3.000 TL
1 Ethereum on 20.08.2020: 4.000 TL
1 Ethereum on 31.12.2020: 2.000 TL

When crypto money is evaluated as “Money”:

Item No:	**EXPLANATİON**	**DEBT**	**RECEİVABLES**
1	----------10/06/2020---------- 100 Cash 100.05 Cryptocurrency Account 100.05.01 Bitcoin(2x50.000) 100.05.02 Etheryum(10x3.000) 102 Banks *Cryptocurrency Purchase Record* ----------,----------	130.000	 130.000
Item No:	**EXPLANATİON**	**DEBT**	**RECEİVABLES**
2	----------20/08/2020---------- 102 Banks 100 Cash 100.05 Cryptocurrency Account 100.05.01 Bitcoin(1x60.000) 100.05.02 Etheryum(5x4.000) 646 Foreign Exchange Sales Profit *Cryptocurrency Sales Record* ----------,----------	80.000	 65.000 15.000
Item No:	**EXPLANATİON**	**DEBT**	**RECEİVABLES**
3	----------31/12/2020---------- 100 Cash 100.05 Cryptocurrency Account 100.05.01 Bitcoin(1x70.000) 646 Foreign Exchange Sales Profit *Bitcoin Sales Record* ----------,----------	20.000	 20.000
Item No:	**EXPLANATİON**	**DEBT**	**RECEİVABLES**

4	----------31/12/2020---------- 656 Foreign Exchange Sales Loss 656.05 Cryptocurrency Selling Account 656.05.02 Etheryum(5x2.000) 100 Cash *Ethereum Sales Record* ----------,----------	5.000	5.000

When cryptocurrencies are considered as "Marketable Securities":

Item No:	**EXPLANATİON**	**DEBT**	**RECEİVABLES**
1	----------10/06/2020---------- 118 Other Marketable Securities 118.05 Cryptocurrency Account 118.05.01 Bitcoin (2x50.000) 118.05.02 Etheryum (10x3.000) 102 Banks *Cryptocurrency Purchase Record* ----------,----------	130.000	130.000
Item No:	**EXPLANATİON**	**DEBT**	**RECEİVABLES**
2	----------20/08/2020---------- 102 Banks 118. Other Marketable Securities 118.05 Cryptocurrency Account 118.05.01 Bitcoin (1x60.000) 118.05.02 Etheryum (5x4.000) 655 Securities Sales Profit *Cryptocurrency Sales Record* ----------, ----------	80.000	65.000 15.000
Item No:	**EXPLANATİON**	**DEBT**	**RECEİVABLES**
3	----------31/12/2020---------- 118 Other Marketable Securities 118.05 Cryptocurrency Account 118.05.01 Bitcoin (1x70.000) 645 Gains on Marketable Securities Sales *Bitcoin Sales Record* ----------,----------	20.000	20.000

Item No:	EXPLANATİON	DEBT	RECEİVABLES
4	----------31/12/2020----------		
	655 Losses on Marketable Securities Sales	5.000	
	655.05 Cryptocurrency Account		
	655.05.02 Etheryum(5x2.000)		
	118 Other Marketable Securities		5.000
	Ethereum Sales Record		
	----------,----------		

Businesses that obtain crypto money by mining serve by making their personal computers suitable for Blockchain use. The miner must have labor and capital to earn income. The income obtained by the continuity of this situation is considered as commercial income. The cost of services, which occurs in the evaluation of cryptocurrencies obtained through mining as a service, is the systematically distributed amount of service production and direct labor costs, and overhead production expenses in the right direction. Obtained cryptocurrencies are seen as "Other Liguid Assets" as they can be easily and effortlessly converted into Turkish Lira. Cryptocurrencies are applied on the valuation day in accordance with the provisions of Article 280 of the TPL. Accordingly, if it is decided that the evaluation will be made according to the stock market value, the purchase price is taken as the basis in case of not acting in accordance with the truth. However, if the foreign currency does not have a current value in the stock market, the valuation rate will be determined by the Ministry of Finance, and if it is not specified, by the Central Bank of the Republic of Turkey. In this case, the valuation difference will be recorded as "Foreign Exchange Gain" or "Foreign Exchange Losses". In case cryptocurrencies are seen as money, it is necessary to make a regulation regarding the exchanges where cryptocurrencies are traded. It is very difficult to determine the stock market values of cryptocurrencies with high volatility. However, it is thought that this situation will be resolved by the Ministry of Finance (Yalçın, 2019, s. 110). When seen as commercial income, based on Article 37 of the Income Tax Law No. 193, cryptocurrencies obtained through mining will be taxed as commercial income. When this situation is evaluated in terms of business, it will be taxed according to corporate income according to KVK No. 5520. In this case, the service provided by the blockchain system becomes income. While electricity and other service production expenses in mining activities are depreciation and direct labor expenses, the shares taken in a systematic way are service costs. At the end of the period, the service cost for which no revenue is earned is included in the balance sheet as "Completed or Incomplete Service Costs" based on "TAS 2 Inventory". Adopting the normal cost system, TMS 2 Inventories requires the normal capacity to be used to reflect fixed service production costs to crypto vehicle costs, while undistributed fixed expenses are included in the cost of sales. Cryptocurrency mined is paid in bitcoin. In this case, bitcoin is converted into national currency and accounted for (Kızıl, 2019, s. 192). Cryptocurrency "Mining" possible accounting entry is given below.

Example:

Ahmet Bey, in order to do bit mining, monitor, case, video card, ram etc. purchases technical equipment for 20,000 TL. During one month of production, he bears the electricity cost of 10.000 TL and obtains 1 Bitcoin. It also sells this bitcoin for 40,000 TL (VAT has been neglected).

Item No:	EXPLANATİON	DEBT	RECEİVABLES
1	----------,----------		
	710 Direct Raw Materials and Supplies Expenses	20.000	
	730 General Production Expenses	10.000	
	100 Cash		30.000
	Accounting for Costs		
	----------,----------		
Item No:	EXPLANATİON	DEBT	RECEİVABLES

2	----------,---------- 157 Other Inventories 711 Reflection Account for Direct Raw Materials and Supplies 731 Reflection Account for General Production Expenses *Transferring Costs to Stocking* ----------,----------	30.000	 20.000 10.000
Item No:	**EXPLANATİON**	**DEBT**	**RECEİVABLES**
3	----------,---------- 102 Banks 600 Domestic Sales *Sales Record* ----------,----------	40.000	 40.000
Item No:	**EXPLANATİON**	**DEBT**	**RECEİVABLES**
4	----------,---------- 623 Cost of Other Sales 157 Other Inventories *Sales Record* ----------,----------	40.000	 40.000

The literature review on cryptocurrencies and their accounting is given below. In the study conducted by Dizkırıcı and Gökgöz (2018), cryptocurrencies and bitcoin accounting in Turkey were discussed. Increasingly, illegal bitcoins are easy to transfer, have high returns, and have very low transaction costs. According to the study, businesses invest in order to benefit from the exchange rate return of their cryptocurrencies, and they can perform collection and payment transactions more easily. In the study conducted by Yüksel (2019), cryptocurrencies and their accounting were examined. The study made predictions about how the accounting record will be on the widespread use of cryptocurrencies. According to the results of the study, it was predicted that cryptocurrencies held for sale could be considered as “2 Stocks” and in other cases “38 Intangible Assets”. In the study conducted by Kılınç (2020), the effect of the rapidly developing blockchain technology with industry 4.0 in terms of the accounting and auditing profession was investigated. According to the study, with the developing blockchain technology, accounting professionals have become able to perform their transactions more easily. In the study conducted by Özdoğan and Karğın (2018), the expectations of blockchain technology in the field of accounting and finance were examined. The study addressed the importance of constantly emerging cryptocurrencies and the resources and savings experienced in smart contracts and blockchain. In the study, the advantages and disadvantages of blockchain technology in accounting and finance are mentioned. In the study conducted by Güdelci (2020), the accounting of crypto money transactions was examined within the scope of International Financial Reporting Standards (IFRS). According to the results of the study, it was decided that cryptocurrencies were the most correct in terms of accounting, despite the increasing criticism on the description of cryptocurrencies as "intangible assets".

3. CONCLUSION

With the emergence of cryptocurrencies, it has been widely used in almost every country. The impact of globalization and technological development on this situation is quite large. Cryptocurrencies are traded as money and securities. These currencies can be converted into national currency at any place or time. However, since it is not affiliated with a particular person, institution or organization, it is prohibited in some countries while it is legal in others. This does not mean that cryptocurrencies cannot be accounted for. The standards and policies need to be reconsidered for the currencies in question, whose usage area is rapidly spreading. Therefore, financial advisors,

accountants, etc. Predictions are made on how cryptocurrencies will be accounted for as money and securities and miners. However, there is no clear accounting record yet. In our study, it is discussed how to account for businesses using cryptocurrencies as money, securities and miners. The currency in question has been evaluated within the scope of the International Accounting Standards and Accounting System Implementation General Communiqué.

References

[1] Aba Şenbayram, E. (2019). Paranın geldiği uç nokta: bitcoin, Econharran, 3(4), 72-92.
[2] Dizkirici A. S. ve Gökgöz A. (2018). Kripto para birimleri ve Türkiye'de bitcoin muhasebesi. Journal of Accounting, Finance and Augditing Studies 4(2), 92-105.
[3] Doğan, Z., Buyrukoğlu, S. ve Kutbay, H. (2018). Türkiye'de bitcoin işlemlerinin vergilendirilmesi ve muhasebeleştirilmesine ilişkin öneriler. Vergi Sorunları Dergisi (361), 32.
[4] Güdelci, E. N. (2020). UFRS kapsamında kripto para işlemlerinin muhasebeleştirilmesi: kripto paralar gerçekten para mi?. Muhasebe Bilim Dünyası Dergisi, 22(2), 237-257.
[5] Gümüş, O. T., Sezer, D., & Aydin M.S. (2018), Elektronik Ödeme Sistemleri, E-Ticaret ve Sanal Paraların Muhasebe Kaydı, Akademik Sosyal Araştırmalar Dergisi, 6(72),166-178.
[6] Kilinç, Y. (2020). Blockchaın teknolojisi: Muhasebe ve denetim mesleği açısından bir inceleme. Muhasebe ve Vergi Uygulamaları Dergisi. 13 (3), 989-1011.
[7] Kizil, C., Hanişoğlu, Ö. Ü. G. S., & Aslan, Ö. Ü. T. (2019). Kripto paraların finansal piyasalara etkileri ve muhasebeleştirilmesi.
[8] Kizil, E. (2019). Türkiye'de kripto paranın vergilendirilmesi ve muhasebeleştirilmesi. Mali Cozum Dergisi/Financial Analysis, 29(155).
[9] Low, K. F. & Teo, E. G. 2017. Bitcoins and other cryptocurrencies as property?, Law, Innovation & Technology, 9(2), 235–268.
[10] Mainelli, M. (2017). Blockchain will help us prove our ıdentities ın a digital world, Harvard Business Review. (Erişim Tarihi: 14.04.2018), https://hbr.org/2017/10/smart-ledgers-can-help-us-reclaim-control-of-our-personal-data.
[11] Örten, R., Kaval, H. ve Karapinar, A. (2013). Türkiye muhasebe finansal raporlama standartları uygulama ve yorumları. (7. Bsk) Ankara: Gazi Kitabevi
[12] Özdoğan, B., & Kargin, S. (2018). Blok zinciri teknolojisinin muhasebe ve finans alanlarına yönelik yansımaları ve beklentiler. Muhasebe ve Finansman Dergisi, (80), 161-176.
[13] P2P Network (Left) vs. Client/Server Network (Right) [45], www.peer-to-peer.com, [Accessed: 3 October 202].
[14] Raiborn, C. ve Sivitanides, M. (2015). Accounting issues related to bitcoins. The Journal of Corporate Accounting Finance, 2, 25-34.
[15] Tunçel, M. B., Alptürk, Y., & Gürsoy, S. Kripto paraların popülaritesi ile değerleri arasındaki ilişkinin incelenmesi: Asimetrik nedensellik testi uygulaması. Muhasebe ve Finans İncelemeleri Dergisi, 4(1), 68-76.
[16] Turan, Z. (2018). Kripto paralar, Bitcoin, blockchain, petro gold, dijital para ve kullanım alanları. Ömer Halisdemir Üniversitesi İktisadi ve İdari Bilimler fakültesi dergisi, 11(3), 1-5.
[17] yalçin, S. (2019). Kripto değişim araçlarının muhasebeleştirilmesi. Muhasebe ve Finansman Dergisi, (81), 101-120.
[18] YükseL, F. (2020). Kripto varlıklar ve IFRS kapsamında kripto paraların muhasebeleştirilmesi. Muhasebe ve Vergi Uygulamaları Dergisi, 13(2), 429-451.Van der Geer, J., Hanraads, J. A. J., & Lupton, R. A. (2000). The art of writing a scientific article. *Journal of Scientific Communications, 163,* 51 - 59.

Implementation of OECD Principles in Public Sector in Kosovo (Case Study Municipality of Peja)

Egzon KASTRATI[a1], Rexhep KURTBOGAJ [b], Jeton ABAZAJ [c], Avni GASHI [d], Kreshnik SMAJLI [e]

[a] *Municipality of Peja, egzon.kastrat@rks-gov.net*
[b] *Municipality of Peja, rexhep.kurtbogaj@rks-gov.net*
[c] *Municipality of Peja, Jeton.Abazaj@rks-gov.net*
[d] *Municipality of Peja, Avni.C.Gashi@rks-gov.net*
[e] *Municipality of Peja, kreshnik.smalji@rks-gov.net*

Abstract

This paper aims to create an overview of the concept and models of corporate governance in public enterprises. Corporate governance is a concept that has received a great deal of attention in recent years. For countries in transition, where there are still problems with law enforcement and the rule of law, corporate governance is a relatively new concept, but more than necessary. The principles of good governance have as their main element responsibility, honesty, confidentiality, transparency and openness of information. Good governance means that you must have knowledge of laws, procedures, and apply them. Good corporate governance regulates the relationship between stakeholders and public enterprises, their boards and managements. Good Corporate Governance is an essential factor for the survival of large corporations and enterprises or businesses in any country, but it is more important for countries in transition. Our main purpose of this study is to take a detailed look at Corporate Governance in public enterprises and banks. This paper will answer the research questions: How does the implementation of the OECD principles affect the increase of generality and transparency in public enterprises? How do the OECD principles affect the improvement of corporate governance of municipality of Peja? A methodology consisting of a combination of primary and secondary data was used to carry out this research paper. A considerable part of the secondary data is provided through the use of libraries, the internet also the theoretical review is based on various examples.

Keywords: OECD principles, municipality of Peja, good governance

1. INTRODUCTION

1.1. Literature review

The NPM is thus seen as a body of managerial thinking (Ferlie et al., 1996: 9) or as an ideological system of thinking based on ideas generated in the private sector and imported into the public sector (Hud, 1991, 1995). The emergence of new public management (NPM) is associated with the changing role of the state and growing demands worldwide for better governance practices (Sharma, 2007; 4). Administrative reform has always had a high degree of failure, both in developed and developing countries (Caiden 1991; Kiggundu 1998) Rather, developing countries should focus on establishing more effective central control mechanisms over functions such as personnel or finance, as this is the forerunner of any eventual delegation (Holmes 1992; Nunberg 1995). New Public Management (NPM)

[1] Corresponding author.

is the most dominant paradigm in the public administration discipline (Arora 2003). This notion contrasts with the notion that citizens are merely recipients of public services and do not have to actively engage in the process of deciding what those services would look like. Indeed, the citizen simply needs to know that he was receiving the same service as the one given to other citizens or recipients, in such a way that no preferential treatment is shown (Miller and Dunn, 2006). This means that the range of permissible discussion does not allow all possibilities to be used; politics has diminished, hence democracy has diminished. It could be argued that some of the key changes would improve the functioning of democracy if implemented fully. The OECD argues "Public management reforms are not responsible for any problem of democratic deficit, rather they are part of the solution." There should be more transparency, improving the role of elected politicians, while focusing on the quality of services and consultations increase opportunities for public involvement. It is also possible that public management reforms were driven, in some countries, by a desire for greater democracy (Hughes, 2003).

2. THEORETICAL PART OF THE WORK

The word "corporation" is derived from the Latin "corpus" which means body, ie it represents a body / group of people. According to the Oxford English Dictionary, a corporation is a group of people authorized to act as an individual. In England the term "corporation" was also used for local government bodies, which had a constituency / small town. In Britain, the term was replaced by the term "council" in 1973, while in the Republic of Ireland in 2001. The only exception is the London corporation, which retains that type of designation today. The concept of corporation in its original form was present many centuries ago. Corporations in ancient India and Rome existed in several forms. Although they lack a number of corporate characteristics today, they were still shareholder companies that invested money for a specific purpose. Such corporations in the Roman Empire were sanctioned / approved by the state, while other corporations in most cases were private commercial entities. With the collapse of the Roman Empire, the Roman concept of corporations was dissolved or merged with other views. Germanic tribes, for example, argued that the entity of a group should have a different identity from that of its members. These conceptions were merged into a common designation in the form of ecclesiastical law, designed by looking at the church in the Middle Ages as a corporate structure.[2] Principles of Corporate Governance:

HONESTY - The corporation communicates with both internal and external audiences, indicating that public financial reports must be accurate, fair and reliable.

• FLEXIBILITY - A resilient Corporate Governance structure is stable and long lasting in the sense that it recovers easily in the event of setbacks and abuses.

• RESPONSE - Effective corporate governance is responsible for the interests and wishes of the parties involved, it is also responsible for new initiatives, and changes if political, regulatory, social and environmental issues.

• TRANSPARENCY - Transparency means that the company is not hiding the right information and that their display is fair, accurate and reliable.[3]

[2] Llaqi Shyqri, Tabaku Jurida, “Corporate Governance”, February 2010, pg. 8,9,10

[3] Prof.As.Dr. Talka Qamil, Kumbaro Mirela “Corporate Governance” Tirana 2010, p.74

3. STATISTICAL DATA AND RESULTS

Table 1. Definition coefficient of independent and dependent variables

Model Summary

Model	R	R Square	Adjusted R Square
1	.926[a]	.853	.838

a. Predictors: (Constant)? public meetings, budget hearings, publication of decisions, cooperation with local councils

In this table is presented the coefficient of determination, R = 0.85, while Rsquare 0.84, or the adjusted coefficient 0.83X100 = 83%, which means the independent variables explain the dependent variable for 83%.

Table 2. significance expressed through anova the explanation F test

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	40.137	4	10.034	158.720	.000[b]
	Residual	18.650	295	.063		
	Total	58.787	299			

Dependent Variable: a. Municipal transparency
b. public meetings, budget hearings, publication of decisions, cooperation with local councils
b. Predictors: (Constant),

Here is presented the model of Anova, where the level of significance is 0.000, which shows that the model has relevant links.

Table 3. Regression analysis expressing the impact of independent variables on dependent variable

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	T	Sig.
1	(Constant)	.116	.066		2.755	.010
	public meetings,	.183	.074	.238	3.487	.000
	budget hearings,	.590	.048	1.097	12.297	.000
	publication of decisions,	.862	.076	.483	11.410	.000
	cooperation with local councils	.179	.050	.373	3.607	.000

a. Dependent Variable: Municipal transparency

In this table is presented the regression analysis, which shows how many independent variables have an impact on the dependent variable, which is explained through the OSL equation,

$$Y=B_0+B_1X_1+B_2x_2+B_3X_3+B_4X_4+Ui$$

In the table 1 are presented coefficients and their significance for the Municipal transparency, the analyses done for banking market in Kosovo. Table shows that independent variables that consist public meetings, budget hearings, publication of decisions, cooperation with local councils which all together have impact on dependent variable municipal transparency. Based in research question - How do the OECD principles affect the improvement of transparency of municipality of Peja. **The implementation of OECD principles has increased the transparency in the municipality of Peja.**

Table 4. correlation analysis expresses connectiveness between two variables.

Correlations

		Financial reports on municipal budget expenditure	Municipal accountability
Financial reports on municipal budget expenditure	Pearson Correlation	1	.432**
	Sig. (2-tailed)		.000
	N	300	300
municipal accountability	Pearson Correlation	.432**	1
	Sig. (2-tailed)	.000	
	N	300	300

According to this, there is a strong, positive and important relationship between Financial reports on municipal budget expenditure and municipal accountability at the level sig 0.000 which is less than 5% of the calculated coefficient. From this, we can say that there is a positive relationship between these two variables.

4. CONCLUSION AND RECOMMENDATION

The municipality of Peja has taken concrete steps to increase transparency and accountability key elements that are part of good governance and inclusive.

Involvement of citizens and other groups in decision-making should remain a priority of the government.

Developing more practical models for inclusion remains a key priority related to the municipal transparency strategy.

Ongoing reporting on financial statements, public consultations, budget hearings will increase the responsibility of the municipality of Peja.

Involvement of women from communities and other social groups increases inclusion in effective decision-making.

References

[1] Arora, Ramesh K. (2003). New Public Management: Emerging Concerns, Prashasnika, Volume XXX, Number 2.
[2] Hood, Christopher (1991). 'A Public Management for All Seasons?'. Public Administration 69(1): 3–19.
[3] Hood, Christopher. (1994). Explaining Economic Policy Reversals, Buckingham: Open University Press.
[4] Holmes, Malcolm (1992). 'Public Sector Management Reform: Convergence or Divergence?'. Governance 5(4): 32. 472–83.
[5] Miller. David Y. and Dunn. William N. (2006). A Critical Theory of New Public Management. University of Pittsburgh.
[6] Hughes, O. E. (2003). Public Management and Administration. London: Macmillan.
[7] Llaqi Shyqri, Tabaku Jurida, "Corporate Governance", February 2010, pg. 8,9,10.
[8] Prof.As.Dr. Talka Qamil, Kumbaro Mirela "Corporate Governance" Tirana 2010, p.74.

Agile Management: Literature Review and Trending Topics

Norbert NINDL[a*]

[a] *University of Latvia, norbert.nindl@nindl.co*

Abstract

The radically changing concept of the business environment confronts firms and their leaders to find new, smarter and more efficient ways of organizing activities. Thereby, reducing risks of uncertainty, improving the development of services and products, and developing their employees and leaders independently and self-responsible to gain the firm's success. In this context, the transition of the agile software development process to various other business domains or even the whole organisation can be seen as a major initiative in management. This paper analyses the scientific literature on agile management in an innovation business context. As method a systematic literature review is applied to the published literature of the recent decade. The author conducts a descriptive analysis and a deep structured content analysis to present the identified scientific work. Consequently, the paper concludes by discussing the trending topics of agile management and emphasized the need for further research to make the agile management approach more tangible as a normative mechanism.

Keywords: agile management, innovation, agility.

1. INTRODUCTION

All regions face similar challenges in delivering sustainable transport solutions to meet their current and future mobility requirements. Transport authorities are aware of the real needs specific to their region but often find it difficult to identify detailed information on targeted solutions that would deliver direct and tangible positive outcomes.

Companies and managers today face the challenge of adapting their businesses to the rapidly changing business environment. Environmental influences such as changing technologies, globalisation, changing competitive situations or, currently, pandemics can put corporate structures, production processes, the labour market and thus the available workforce to an existential test in a very short time. Managers are confronted with adapting their corporate structures in order to react quickly to the demands of customers and the market. This requires innovations in management. One such approach to reacting to uncertain and changing conditions is the agile project management approach from software development. This paper deals with building an understanding of how the agile project management approach from software development can be transferred to agile management. In this context, the author conducted a review of the current literature.

1.1. Theoretical foundation on agile management.

Agile management has its grounding in the theory of agile project management out of software development processes. The principles of agile software development were defined and written down as „Agile Manifesto“ in February 2001 by seventeen software developers, representatives of various agile and iterative and adaptive software development practices (e.g. SCRUM, extreme programming)

* Corresponding author.

The principles stated by the agile manifesto are used by the author to derive attributes of agile for analysing the contribution of agile management in innovation processes in current academic literature (Beck et al. 2001)

- *Our highest priority is to satisfy the customer through early and continuous delivery of valuable software.*
- *Welcome changing requirements, even late in development. Agile processes harness change for the customer's competitive advantage.*
- *Deliver working software frequently, from a couple of weeks to a couple of months, with a preference to the shorter timescale.*
- *Business people and developers must work together daily throughout the project.*
- *Build projects around motivated individuals. Give them the environment and support they need and trust them to get the job done.*
- *The most efficient and effective method of conveying information to and within a development team is face-to-face conversation.*
- *Working software is the primary measure of progress.*
- *Agile processes promote sustainable development. The sponsors, developers, and users should be able to maintain a constant pace indefinitely.*
- *Continuous attention to technical excellence and good design enhances agility.*
- *Simplicity--the art of maximizing the amount of work not done--is essential.*
- *The best architectures, requirements, and designs emerge from self-organizing teams.*
- *At regular intervals, the team reflects on how to become more effective, then tunes and adjusts its behaviour accordingly.*

2. RESEARCH METHODOLOGY

In this paper, the method of a systematic literature review (SLR) is applied. The SLR offers a systematic procedure to analyse current publications in a comprehensible and repeatable way (Snyder, 2019). The SLR procedure is applied to the area of agile management in the innovation-creating business context.

Secondary data in the form of scientific literature from the last 10 years are used. The aim is to create a grounded statement on current trends in research on this basis and thus to be able to define and state possible future research activities and directions.

In this context, research offers a multitude of approaches to process an SLR to ensure transparency and high quality in research (Xiao and Watson, 2019). In this study, the author follows the suggestions of Woschank et al. and the guidelines of Denyer et al and Hokka et al (Woschank et al., 2020).

The suggested SLR path could be divided into three steps:

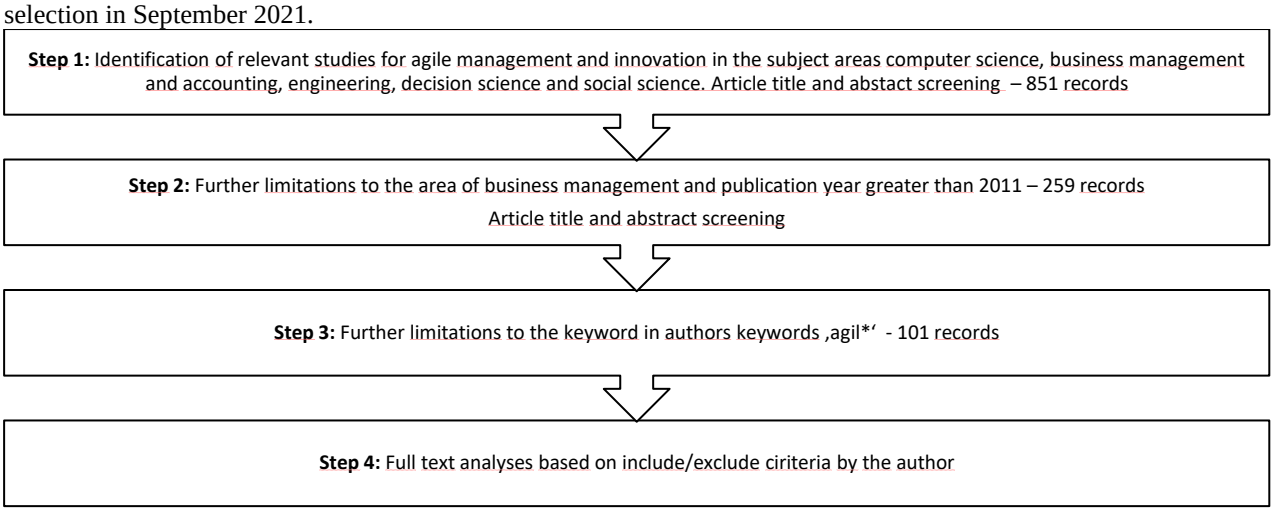
- Step 1: Definition of research objective, scope and assumptions
- Step 2: Definition of the search query and collecting the data
- Step 3: Validation of Research Results

2.1. Definition of research objective, scope and assumptions

This paper aims to evaluate possible and future directions for agile management in an innovation-creating business context by analysing the current research on the agile management approach, the normative understanding of agile management and its impacts to the various business levels and its organizational structures. The author focuses on valuation of the research of the last 10 years to identify the key activities for future research and implication on practical applications.

2.2. Definition of the search query and collecting the data

The SLR requires in the strep definition of the search query search term, affected data databases and publication period. The author selected for this study SCOPUS database. The selection period is from 2012 until the date of selection in September 2021.



Source: author's compilation.

Fig. 1. Process steps of the systematic literature review.

In the first step of the SLR the author creates a first view on the relevant research literature. The meta search on SCOPUS database were defined with the search pattern TITLE-ABS-KEY (agile AND management AND innovation) without ether any limitation to the selected period of time nor to any specific business area. The impression of relevant literature results inn 851 records.

In the second step the author limited the search results to relevant record in the period between 2012 and the selection date of September 2021 and the focus on the business area of business management. The applied search string on the database was TITLE-ABS-KEY (agile AND management AND innovation) AND PUBYEAR > 2011 AND - (LIMIT-TO (SUBJAREA , "BUSI")) . The search query results in 259 records. In an article title and abstract screening, the author could investigate all relevant keyword from the search string.

For the ongoing steps three and four the results of step two were exported to a local CSV file including several attributes on citation information, bibliographic information, abstract and keywords. Based on this file further focusing selection criteria's were applied. The author limited the results based on a fragment of the search string 'agile' by the pattern 'agil*' on the publication keywords from the authors. This results in 101 records for the further research process.

2.3. Validation of Research Results

For the subsequent analyses, only the publications regarding agile management in innovation creation business environments or environment characterized by uncertainty were considered. The identified papers were labelled with 'high', 'medium' and 'low' concerning their relevance for the research objective.

As an evaluation schema of the identified publication following set of questions were defined:

- Does the publication address aspects of the agile management approach from a perspective of the different management levels a) top management b) mid management?
- Does the publication address aspects of the agile management approach from a perspective of employees and team members?
- Does the publication address implication of agile (management) aspects on the improvement of innovation processes or outcome?
- Does the publication address transformational challenges to an agile organisation?

Table 1. Research results of the systematic literature review (SLR).

Relevance	Number Publications	Publications (%)
Total studies	101	100.0
High relevance	24	23.8
Medium relevance	39	38.6
Low relevance	38	37.6

Source: author's compilation.

Based on the answers to the questions the papers were clustered. Out of the 101 identified publications, 24 publications (23.8%) were classified as 'high', 39 publications (38.6%) were classified as 'medium' and 38 publications (37.6%) were classified as 'low' in their relevance for the research objective.

3. RESEARCH RESULTS

The following section of this paper is divided into two sections. The first section is the analysis of the descriptive finding of the SLR. In the second section, the full texts of the identified 'high relevant' publications will be discussed.

3.1. Descriptive Analyses

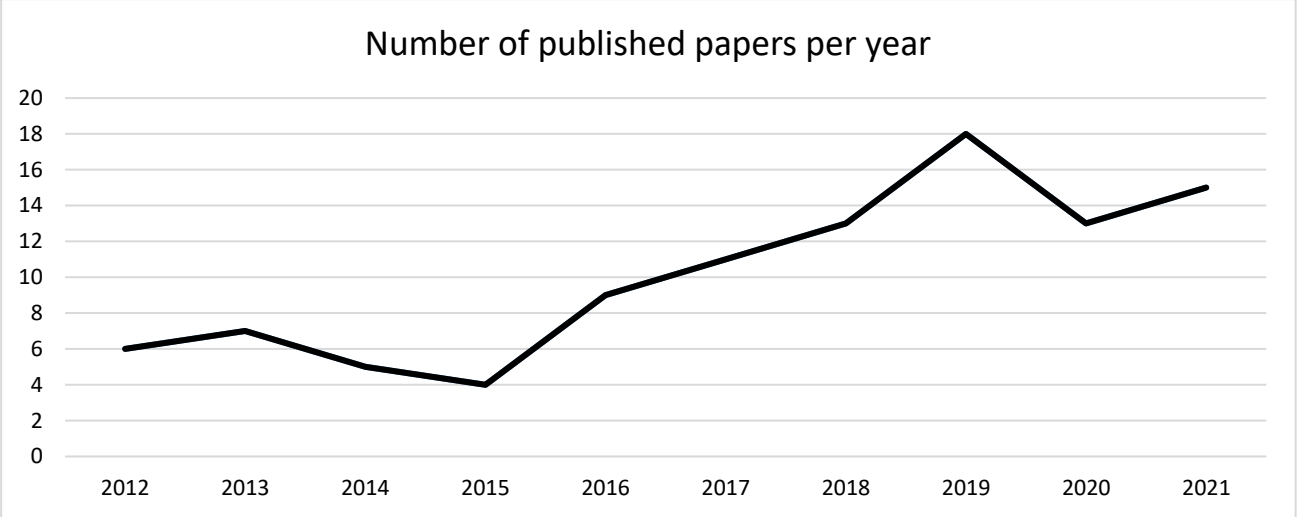
The section descriptive analyses show three different perspectives on the data set of identified papers.

Table 2. described the distribution of the publication based on their document types. Most of the papers were published as articles (61.4%) or conference papers (31.0%).

Table 2. Research results – distribution of document types.

Document Type	Number Publications	Publications (%)
Total studies	101	100.0
Articles	62	61.4
Conference papers	31	30.7
Review	5	5.0
Book and Book Chapters	2	2.0
Notes	1	1.0

Source: author's calculation based on the result set of SCOPUS.



Source: author's calculation based on the result set of SCOPUS.

Fig. 2. Research results – development of relevant research studies 2012 - 2021.

The development of the relevant research studies over the period from 2012 to 2021 is shown in the following Figure 2. We can see an increase in the first period from 2012 to 2013 followed by a decrease in the years until 2015. From 2015 to 2019 the yearly number of published papers increases at a constant rate up to the peak of the selected period to 18 papers per year in 2019. Since that year the number of published papers did not reach that peak again. In 2020 we have seen 13 papers followed by 15 papers in the year 2021, which have not been fully considered.

Edwordle - weights
Agile: 1.0
management: 0.84
innovation: 0.82
Supply: 0.64
Chain: 0.64
Author Keywords

Edwordle - weights
management: 1.0
Agile: 0.89
innovation: 0.86
Project: 0.80
Software: 0.80
Index Keywords

Source: author's compilation based on the results of edwordle.

Figure 3. Research results – Analyses of keywords.

The keywords were analysed by using the online software tool edwordle (Yunhai Wang and Seldmai, 2017) which is based on the tool wordle. Thereby the collection of keywords, exported from the database SCOPUS was used as import values. Edwordle creates a word cloud out of the entered keywords ranked by the frequency of its concurrency. Thereby following the rule, the more often a keyword is used the higher is the rank of the word and displayed in a

bigger size. As a result, out of the ranking, consistency in the user's search terms in the previous process steps of the SLR can be interpreted.

3.2. Content Analyses

Table 3. Research results – content analyses

Cluster	Content	Type of Study
Improvement of product and service development.	Five approaches to accelerate product development in uncertainty exemplified by the pandemic. A) focused project teams b) prioritizing the project portfolio c) fewer projects d) digital tools to accelerate knowledge generation e) lean development	CA
Transferring the agile approach to different business domains than software development	A case study on transferring the agile approach from software development to digital marketing by building an incremental feedback loop on the effects of digital marketing projects.	CS
Improvement of product and service development.	A survey-based study to show the relation between agile manufacturing and the firm's management capacities related to innovation and production.	E
Transferring the agile approach to different business domains than software development	Conceptual discussion on the implementation on agile project management in domains outside of software development.	LR
Developing employees	A survey-based study to show the impact of communication, employee motivation on the project success using an agile framework.	CA
Transformational change to agile: value driven business (values, behaviours, purpose orientation)	Quantitative research study based on secondary data to analyse reasons for rejection and adoption of agile software development methods in Japanese Organizations.	E
Developing employees	Conceptual approach on impact levers to innovative digital project teams during the digital transformation. (Iterative goal setting, diverse and targeted team composition, continues learning, talent management)	CA
Improvement of product and service development.	A case study discussing aspects of agile management implemented by the firm Wikispeed. Discussed aspects are customer focus, self-organizing teams, dynamic linking, values. Transparency and continuous improvement, horizontal communications.	CS
Developing employees	A review and discussion of a participant perspective in an innovation lab. Discussed perspectives are self-responsible working, effective teams, transfer back into the organization,	LR
Transformational change to agile: value driven business (values, behaviours, purpose orientation)	The study shows the positive impact of project agility on the firm's performance in an innovational environment.	E
Developing agile leadership	The study discussed the key levers of the concept of the leadership agility framework.	CA
Transformational change to agile: value driven business (values, behaviours, purpose orientation)	The study has the multidimensions of a review and finding from a case study of CISCO. It discusses a conceptual approach of management practices to enable and support the agile development process. And actions to help the transition to agile processes.	CS

Cluster	Content	Type of Study	Reference
Developing agile leadership	The study analyses the impact of peer pressure on the innovativeness moderated by the leaders control in agile teams.	E	(Cooper, 2021)
Improvement of product and service development.	The study introduces the concept of agile incrementalism. It focuses on the phenomenon of service infusion.	CS	(Randall, 2014)
Transformational change to agile: value driven business	A discussion on the impacts to the orgaisational culture during the transition process to Agility.	LR	(Sánchez et al., 2019)
Organizational structure of agile businesses	A discussed approach on agile teams exploring opportunities for market creating innovations.	CA	(Ciric et al., 2018)
Transformational change to agile: value driven business	A discussion on success factors in agile management.	CA	(Salman et al., 2021)
Transformational change to agile: value driven business	The review study investigates the key elements of the agility construct for project management theory. The construct was tested through a survey.	LR	(Seki and Kohda, 2020)
Organizational structure of agile businesses	In the study transformation, organizational agility, dynamic capabilities, agile strategy and adaptable organizational structures are discussed.	LR	(Guinan et al., 2019)
Developing agile leadership	The study discusses agile leadership styles, agile people and sustainability as key variables in the quest to design, develop and maintain agile organizations in the quest of transformation.	LR	(Denning, 2012)
Improvement of product and service development.	The explorative study analyses the impact of agility on the market performance of global firms.	E	(Fecher et al., 2020)
Transformational change to agile: value driven business	Applying agile and lean elements to accelerate innovation culture in a large organization – key learnings after one year journey. This paper is limited to the intermediary results achieved after the first year being (1) ideas-to-innovations value stream established (2) idea flow and positive pull created among personnel and (3) group of perfection practices has been stabilized for	CS	(Ju et al., 2020)
Transformational change to agile: value driven business	The study describes the impact of agile on continuous innovation.	CA	(Joiner, 2019)
Improvement of product and service development.	This study explores the early stages of innovation: the predevelopment stages leading to development. The paper examines the agile project management approach as a flexible and dynamic approach to manage the predevelopment stages of innovation. Scholarly sources reveal insufficient findings, signaling a gap in the literature in the areas of fuzzy	CA	(Chen et al., 2016)

Table 4. Research results – content analyses

Reference	(Khanagha et al., 2021)	(Kowalkowski et al., 2012)	(Holbeche, 2019)	(Denning, 2017a)	(Denning, 2018)	(Conforto et al., 2016)	(Appelbaum et al., 2017a)	(Appelbaum et al., 2017b)	(Nemkova, 2017)	(Partanen and Matinlassi, 2015)	(Denning, 2013)	(Gonzalez, 2014)

The results of the full text analyse were aggregated into the following six clusters:

1. Improvement of product and service development.
2. Transformational change to agile: value driven business (values, behaviours, purpose orientation)
3. Transferring the agile approach to different business domains than software development
4. Developing employees
5. Developing agile leadership
6. Organizational structure of agile businesses

Improvement of product and service development. A total of 6 (25%) of the identified articles were assigned to the cluster "Improvement of product and service development". In this context, Cooper identified in his study five approaches to accelerate product development during the pandemic. The discussed approaches are related to agile principles of focusing on developments prioritized by the current market and customer needs. Out of this aspect, he stated the approach of prioritising the project portfolio and reducing the number of executed projects. Further, Cooper highlighted the organizational approach of lean management applied as a lean development and the approach of using and implementing digital tools to accelerate the knowledge generation (Cooper, 2021). The aspect of prioritizing the customer needs was addressed by the case study of WikiSpeed by Denning too (Denning, 2012). In the study, the customers were included in the product development process. Additionally, Denning identified the positive impact of self-organized teams and the horizontal communication between the development teams on reducing risks and adopting fast needed changes. To the findings of Kowalkowski et al., an iterative adoption to the customer offers a powerful option to improve service-infusion initiatives in the material handling industry (Kowalkowski et al., 2012). Nemkova added the perspective of international acting firms and complement the literature on the performance drivers of born global firms with agility (Nemkova, 2017).

Transformational change to agile: value-driven business (values, behaviours, purpose orientation). A total of 8 (33%) of the identified articles were assigned to the cluster "Transformational change to agile". Reasoning the transformational change to agile can follow the results of Ju et al, where the mediating role of project agility between the innovation ability and innovation performance was positive tested (Ju et al., 2020). Reasons for adoption or rejection of agile project management methods exemplified in software developing Japanese Organisations were investigated in the quantitative research of Seki and Kohda (Seki and Kohda, 2020). In their study they identified six key constructs of rejection, these are skills shortage, quality concerns, concerns about team responsiveness, concerns about management responsiveness, unclear effectiveness and project-suitability issues. The six key constructs of adoption are customer understanding, customer participation awareness, management understanding, organisational efforts, member ability improvement and quality initiatives.

The path thru the transformational change to agile is addressed in the study of Denning. In his conceptual approach, the transition is divided into 2 main parts. The first part of the transition focuses on making experience with agile processes and agile organisation within operational units to achieve strategic agility in a second step (Denning, 2017b). In a second study Denning stated the following success factors of agility: a) agile a paradigm shift in management, b) encouraging agile leadership throughout the organization, 3) maintaining a focus on the firm's true purpose, 4)

focusing on the substance of agile, 5) recognizing the scale of the challenge, 6) deferring organizational change to later in the process, 7) communication (Denning, 2018). The case study of the firm CISCO emphasised the challenges 1) supporting the teams and units with knowledge and practical experience and 2) developing of new management practices in the transition to agile development processes (Chen et al., 2016). Following actions to help the transition to agile were explained: a) identifying potential benefits for the transition (e.g. faster time to market, focused products, people engagement), b) defining criteria to assess the readiness of business units to make the transition (leadership buy-in, task interdependence, and stages of the tasks), c) multi-step efforts to support the transition, adjusting the work conditions, agile training and knowledge transfer. Following management practices to enable and support the agile development process were stated. a) leading agile teams: reduce the micromanagement, delegate and empower the teams, and focus on supporting the teams by reducing task barriers and garnering cross-team support. B) Using the dual team approach for planning and forecasting, one team focus on developing the new products and the other team focuses on the long-term planning. C) coordination in the development process, within the teams, cross-team coordination, and coordination with external co-developments. D) recruiting early collaborative customers for working with multiple collaborative customers to minimise the risk of wrong single customer influences.

Transferring the agile approach to different business domains than software development. A total of 2 (8.3%) of the identified articles were assigned to the cluster "Transferring the agile approach to different business domains than software development". The review of Ciric et al. discussed the application of agile project management in different domains than software development. Ciric et al. identified project characteristics signalling a better fit for agile project management, which are 1) projects with poorly defined scope, 2) unknown and perhaps unknowable task times, 3) unknown number and set of tasks implies unknown task dependencies, 4) unknown availability of resources, 5) small project teams, 6) unclear or creative and innovative requirements, 7) close and frequent collaboration with users, 8) project size-smaller projects, 9) structurally complex and iterative project plan (Ciric et al., 2018). Characteristics which did not match each kind of project. The study proposed four different domains for the application of agile project management. The domains are innovation management and product development, construction and real estate, education and service industry. The common benefits are improvement of time to market, flexibility, improving communication and cooperation between project stakeholders, and reducing risks thru faster adaptation to changing requirements. Within project teams, the cultural values of transparency and openness are mentioned. Similar characteristics were stated in the case study of Randall by analysing the agile approach within IBM adopted by the business unit digital marketing (Randall, 2014).

Developing employees. A total of 3 (12.5%) of the identified articles were assigned to the cluster "Developing employees". Salman et al. conducted a quantitative nonexperimental based study on the relation between the communication of customers, project managers, and the agile development team and the project success. The second dependency is the relationship between employee motivation and project success (Salman et al., 2021). The direct dependent factors for the motivation of a software development team are accomplishment, an opportunity for growth, work itself, appreciation, development, practical supervision, accountability, and peers' relation. This generates the implication of a transition to an agile work environment, the need for knowledge transfer and training on the agile methodology and the possibility of communication between the different teams in order to allow a self managed working environment. Guinan et al. seized the topic of motivated employees in order to conduct a conceptual approach to creating innovative digital project teams. In this approach four levers of an innovative digital project team are identified: 1) diverse and targeted team composition, 2) iterative goal setting, 3) a continuous learning approach, and 4) talent management (Guinan et al., 2019). In order to achieve those levers, it is essential to enable the employees in their roles. Especially to support employees in their development to independent employees in a self-managed environment. Additionally, the study of Fecher et al. discusses the perspective of a participant in an innovation lab (Fecher et al., 2020). Fetcher et al. emphasized the underestimated support of talented but inexperienced employees in a self-responsible working environment, the peer pressure of ineffective teams and the rising demotivating factors by moving back into the old structures of the organization.

Developing agile leadership. A total of 3 (12.5%) of the identified articles were assigned to the cluster "Developing agile leadership". Appelbaum et al. conducted a literature review on the leadership continuum toward reaching comprehensive agility in organisations. In their work they discussed four perspectives of agile leadership, 1) the leadership style, and leadership dynamics, 3) risk-bearing attitudes and decision-making environments and 4) leadership development. In the second part, they discussed the agile employee as the target mission for the agile leader. The main aimed aspects are employee satisfaction, teams strive and agility and sustainability. To reach these aspects the leaders should support the communication within the company and external with the customers and involve the employees in the decision-making process of strategic planning (Appelbaum et al., 2017b). Leadership behaviour is

the focus of the study by Khanagha et al. In study they conducted a survey to show the relationship between peer pressure and innovative output under the influence of a leader's control. In the concept leader's control is differentiated into diagnostic control and interactive control. The study underlines the importance of peer pressure as a motivational state in self-managing teams and shows that leaders' diagnostic and interactive controls moderate the relationship between peer pressure and team innovation. Diagnostic controls positively affect innovative output when peer pressure is high and have a potentially negative effect when peer pressure is low. Interactive controls also demonstrate an overall positive effect, but the effect is strongest when peer pressure is low (Khanagha et al., 2021).

The organizational structure of agile businesses. A total of 2 (8.3%) of the identified articles were assigned to the cluster "Organizational structure of agile businesses". Appelbaum et al. conducted a review on the challenges of organisational agility. In their introduction, they picked up the driving forces to change an organisational form. They are new technology, new types of competition, economic uncertainty, evolving customer need, deregulation, globalization and fragmentation of markets. As the blanket solution dealing with the fast-paced changes of the present, they suggested the employment of organisational agility (Appelbaum et al., 2017a). Goldman et al. (2017 cited by Appelbaum et al) grouped the capabilities of agile organisations into the four strategic dimensions: enrichment of customers, competitive enhancements by cooperation, mastery of uncertain change and leverage of key people and information. As for performance key driver, Appelbaum et al. emphasized the strategic commitment to agility and the importance of environmental scanning as parts of the agile strategy. The adaptable organizational structure is explained with the approach of the dual structure and the approach of the network structure. The approach of the dual structure was suggested by Kotter (2014) (2017 cited by Appelbaum et al), it proposes a dual structure, where a "strategy operating system" runs in tandem with the traditional "performance operating system", in order to ensure that renewal can be continuous rather than episodic.

4. DISCUSSION

The application of the SLR to agile management in an innovation-creating business context could be divided into six clusters of research directions. The main direction addresses the transformational change to agile. A broad field of research. The publications deal with properties derived from agile software development in application to different business areas. In this first cluster of publications, the following research sub directions can be identified:

a1) Influence of agility (which in most cases is related to project management and project execution in the company) on company performance (which is measured by project success). b1) Positive influence of agile processes and methods on the development opportunities of employees through self-responsible work, and co-determination opportunities in the decision-making processes of planning and strategic planning of the company. c1) Only a small proportion of publications deal with the negative influences of agility on employees. d1) Challenges of the management in adapting the corporate culture and the "unconditional" orientation of the company according to customer requirements.

The second-largest cluster deals with research into the use of agile management principles and methods to improve product and service development. Comparable to the first cluster, most of the publications relate to project management. Research trends are a2) Influences of agility on the reduction of time-to-market b2) Influences of agility on risk in the development process by developing innovations, products and services in an iterative project approach, in which the project risk is to be minimised through strong cooperation with the customer. c2) Reduction of risk through an iterative product development process using prototypes. d3) Increasing performance through focus. Focusing on the implementation of products and services, focusing on the tasks and areas of responsibility of employees and teams. e3) Increasing performance through a strongly collaborative orientation of staff and team.

The equally large clusters three and four deal with the challenges of employees and those of leaders. The following trends were identified among employees: a3) Influence of employee motivation in agile teams on project performance as well as on innovation. b3) Importance of self-responsible working on employee motivation and identification. c3) Effort and strain in high-performance teams. d3) Dependence on and expectations of leadership. e3) Driving factors for independent learning. In addition, in the cluster of managers, a4) the influence on employee motivation, b4) the importance of leadership style on the performance of high-performing teams under peer pressure, c4) the adjustment of leadership style from a directive to a diagnostically supportive leadership style, could be identified.

The lowest number of publications is found in clusters five and six. Cluster five deals with Transferring the agile approach to different business domains than software development. Also at this point, the literature in the consideration of agile refers very strongly to project management and the associated project management methods in a5) the application in different domains.

Cluster six bundles the publications on research into the organisational structure in agile companies. Here, a6) factors influencing an agile company and b6) innovative agile company forms are investigated.

In summary, the term "agile" in the research work on "agile management" is strongly related to the factors of agile software development described at the beginning (defined in the "Agile Manifesto"). A large part of the research work refers to project management or its methods when investigating the causalities of the agile approach on project structures. In Randall's (Randall, 2014) publication, the future importance of agile management was justified by the fact that its importance will increase because there will be more and more projects and products from different business domains in which software development plays a role. This underlines the author's observation.

A recommendation for future research could be to develop a normative mechanism as a contribution to a theory of agile management.

5. CONCLUSIONS, RECOMMENDATIONS

In this paper, a systematic literature review of current research trends on agile management in innovation-developing business units was conducted.

- The SLR was conducted in a four-stage selection process based on data from the SCOPUS database over the last 10 years.
- The result set of 101 publications was divided into three levels of relevance. 24 - high relevance, 39 medium relevance, 38 low relevance.
- The entire result set of 101 items was subjected to a descriptive analysis in the first step.
- The results of the high-relevance papers were described in structured content analysis.
- Six research directions were defined: 1. Improvement of product and service development. 2. Transformational change to agile: value-driven business (values, behaviours, purpose orientation) 3. Transferring the agile approach to different business domains than software development 3. Developing employees 4. Developing agile leadership 5. The organizational structure of agile businesses. In the discussion the six research directions were enriched by 20 sub-directions.

Recommendations for further research.

- Furthermore, a lack of studies on a definition of a normative mechanism to agile management was outlined.

References

[1] Appelbaum, S.H., Calla, R., Desautels, D., Hasan, L., 2017a. The challenges of organizational agility (part 1). ICT 49, 6–14. https://doi.org/10.1108/ICT-05-2016-0027

[2] Appelbaum, S.H., Calla, R., Desautels, D., Hasan, L.N., 2017b. The challenges of organizational agility: part 2. ICT 49, 69–74. https://doi.org/10.1108/ICT-05-2016-0028

[3] Chen, R.R., Ravichandar, R., Proctor, D., 2016. Managing the transition to the new agile business and product development model: Lessons from Cisco Systems. Business Horizons 59, 635–644. https://doi.org/10.1016/j.bushor.2016.06.005

[4] Ciric, D., Lalic, B., Gracanin, D., Palcic, I., Zivlak, N., 2018. Agile Project Management in New Product Development and Innovation Processes: Challenges and Benefits beyond Software Domain, in: TEMS-ISIE 2018 - 1st Annual International Symposium on Innovation and Entrepreneurship of the IEEE Technology and Engineering Management Society. Institute of Electrical and Electronics Engineers Inc. https://doi.org/10.1109/TEMS-ISIE.2018.8478461

[5] Conforto, E.C., Amaral, D.C., da Silva, S.L., Di Felippo, A., Kamikawachi, D.S.L., 2016. The agility construct on project management theory. International Journal of Project Management 34, 660–674. https://doi.org/10.1016/j.ijproman.2016.01.007

[6] Cooper, R.G., 2021. Accelerating innovation: Some lessons from the pandemic. Journal of Product Innovation Management 38, 221–232. https://doi.org/10.1111/jpim.12565

[7] Denning, S., 2018. Succeeding in an reasingly Agile world. Strategy and Leadership 46, 3–9. https://doi.org/10.1108/SL-03-2018-0021

[8] Denning, S., 2017a. Strategic Agility: using Agile teams to explore opportunities for market-creating innovation. Strategy and Leadership 45, 3–9. https://doi.org/10.1108/SL-04-2017-0032

[9] Denning, S., 2017b. The next frontier for Agile: strategic management. Strategy and Leadership 45, 12–18. https://doi.org/10.1108/SL-02-2017-0021

[10] Denning, S., 2013. Why Agile can be a game changer for managing continuous innovation in many industries. Strategy & Leadership 41, 5–11. https://doi.org/10.1108/10878571311318187
[11] Denning, S., 2012. How Agile can transform manufacturing: The case of Wikispeed. Strategy and Leadership 40, 22–28. https://doi.org/10.1108/10878571211278859
[12] Fecher, F., Winding, J., Hutter, K., Füller, J., 2020. Innovation labs from a participants' perspective. Journal of Business Research 110, 567–576. https://doi.org/10.1016/j.jbusres.2018.05.039
[13] Gonzalez, W., 2014. Applying agile project management to predevelopment stages of innovation. International Journal of Innovation and Technology Management 11. https://doi.org/10.1142/S0219877014500205
[14] Guinan, P.J., Parise, S., Langowitz, N., 2019. Creating an innovative digital project team: Levers to enable digital transformation. Business Horizons 62, 717–727. https://doi.org/10.1016/j.bushor.2019.07.005
[15] Holbeche, L.S., 2019. Shifts in Organizational Culture When Implementing Agility. Journal of Creating Value 5, 124–138. https://doi.org/10.1177/2394964319853164
[16] Joiner, B., 2019. Leadership Agility for Organizational Agility. Journal of Creating Value 5, 139–149. https://doi.org/10.1177/2394964319868321
[17] Ju, X., Ferreira, F.A.F., Wang, M., 2020. Innovation, agile project management and firm performance in a public sector-dominated economy: Empirical evidence from high-tech small and medium-sized enterprises in China. Socio-Economic Planning Sciences 72. https://doi.org/10.1016/j.seps.2019.100779
[18] Khanagha, S., Volberda, H.W., Alexiou, A., Annosi, M.C., 2021. Mitigating the dark side of agile teams: Peer pressure, leaders' control, and the innovative output of agile teams. Journal of Product Innovation Management. https://doi.org/10.1111/jpim.12589
[19] Kowalkowski, C., Kindström, D., Alejandro, T.B., Brege, S., Biggemann, S., 2012. Service infusion as agile incrementalism in action. Journal of Business Research 65, 765–772. https://doi.org/10.1016/j.jbusres.2010.12.014
[20] Nemkova, E., 2017. The impact of agility on the market performance of born-global firms: An exploratory study of the 'Tech City' innovation cluster. Journal of Business Research 80, 257–265. https://doi.org/10.1016/j.jbusres.2017.04.017
[21] Partanen, J., Matinlassi, M., 2015. Applying agile and lean elements to accelerate innovation culture in a large organization – key learnings after one year journey. Lecture Notes in Business Information Processing 212, 262–269. https://doi.org/10.1007/978-3-319-18612-2_26
[22] Randall, R.M., 2014. Agile at IBM: Software developers teach a new dance step to management. Strategy and Leadership 42, 26–29. https://doi.org/10.1108/SL-01-2014-0003
[23] Salman, A., Jaafar, M., Malik, S., Mohammad, D., Muhammad, S.A., 2021. An Empirical Investigation of the Impact of the Communication and Employee Motivation on the Project Success Using Agile Framework and Its Effect on the Software Development Business. Business Perspectives and Research 9, 46–61. https://doi.org/10.1177/2278533720902915
[24] Sánchez, Á.M., Pérez-Pérez, M., Vicente-Oliva, S., 2019. Agile production, innovation and technological cooperation: Overlapping priorities of manufacturing firms. Baltic Journal of Management 14, 597–615. https://doi.org/10.1108/BJM-12-2018-0410
[25] Seki, N., Kohda, Y., 2020. Barriers and Value Co-Destruction in a B2B Project Management Context: Agile Software Development Adoption and Rejection in Japanese Organizations. Journal of Creating Value 6, 155–176. https://doi.org/10.1177/2394964320960871
[26] Snyder, H., 2019. Literature review as a research methodology: An overview and guidelines. Journal of Business Research 104, 333–339. https://doi.org/10.1016/j.jbusres.2019.07.039
[27] Woschank, M., Rauch, E., Zsifkovits, H., 2020. A Review of Further Directions for Artificial Intelligence, Machine Learning, and Deep Learning in Smart Logistics. Sustainability 12, 3760. https://doi.org/10.3390/su12093760
[28] Xiao, Y., Watson, M., 2019. Guidance on Conducting a Systematic Literature Review. Journal of Planning Education and Research 39, 93–112. https://doi.org/10.1177/0739456X17723971

Why Macro-prudential Policy is Important?

Liviu SERBANESCU [a*]

[a] *School of Advanced Studies of the Romanian Academy, Bucharest, Romania, serbanescu.liviu@yahoo.com*

Abstract

The global financial crisis of 2008-2009 revealed that protecting the individual financial institutions is not enough. To protect the financial system as a whole, policymakers needed to take a broader strategy. They called macroprudential policy. This paper explains what is macroprudential policy, and how it might help in the battle against economic crises and what justifies the need for macroprudential policy. In the last two decades policymakers started to pay more attention to Andrew Crockett's ideas, related to the macroprudential approach to financial stability policy.

Keywords: macroprudential; systemic risk; financial stability

1. INTRODUCTION

The role of the banking sector in the economy is particularly important because, as payment intermediaries, transforming the savings of households and companies into investments, managing risks and creating favorable conditions for lending and lending, banks offer other economic participants more opportunities to develop their activities thus, contributing to the growth of the entire economy. In performing their functions, banks become almost the most important link in the financial system, so it is very important to early identify the problems that arise in the banking sector. Given that this sector is particularly sensitive to shocks, effective banking supervision and sufficient bank capital to absorb possible credit losses are necessary conditions to prevent banks from collapsing and to maintain the stability of the entire financial system.

In 2008 the global financial crisis showed that banks financial management and supervision were poorly performed in many countries and banks risks were not assessed well enough so that changes in banking financial management, supervisory principles and banks risk resistance have become particularly relevant.

In order to limit not only credit but also systemic risks, new banking supervision requirements have been urgently adopted, which are being implemented in the European Union in accordance with the Capital Requirements Directive. Given that banks resistance to systemic risk became particularly relevant after the crisis, the above-mentioned directive provided for the granting of a new macro-prudential policy mandate to supervisors and the increase of banks equity. However, the expected implementation of the directive is slightly different in each country, and macro-prudential policy measures have not yet been implemented by all countries, so the analysis of the importance of macro-prudential policy is currently particularly relevant.

Macroprudential policy is more and more popular all over the world. The global financial crisis exposed very clearly the importance of a mandate to utilize macroprudential policy to manage systemic risk.

Furthermore, there is no policy-making pattern, nor is there any empirical data on the efficiency of transmission channels between instruments and objectives. These characteristics of macro-prudential policy are linked with a third political challenge: political economy concerns, which translate into problems in enacting a tougher regulation early on, before risks build.

* Corresponding author.

According to the Bank of England, the primary goal of macro-prudential regulation is to limit the risk of financial instability and the associated macroeconomic costs. It is a necessary component in bridging the gap between macroeconomic policy and traditional financial institution micro-prudential regulation.

Macro-prudential means reducing costs to the economy during a financial crisis, in other words, to reduce the systemic risk, while micro-prudential means preventing the collapse of individual financial institutions. The regulatory implications that macro-prudential policies bring are an extension of the regulatory focus from a narrowly defined depositor protection policy to a system-wide perspective. In this sense, in the macro-prudential world, for example, benchmarking within the same financial group is not effective (deviation from average behavior assumes that average behavior is correct). On the other hand, in the micro-prudential world, comparative analysis within the same group can be one of the main analytical methods.

In addition, the soundness standards of individual financial institutions in the macro-prudential world depend on the degree of influence of the institution on systemic risk, and large financial institutions must have strict standards. On the other hand, in the micro-prudential world, the soundness standard is uniform, which is also reflected in the uniform capital adequacy ratio applied to each bank. Similarly, the health criteria for the macro-prudential are derived from a top-down approach based on the cost and probability of systemic risk, while the health criteria for the micro-prudential are bottom-up.

2. LITERATURE OVERVIEW

Financial institutions take excessive risks because of the coexistence of inadequately regulated deposit insurance and bank portfolios. This paradigm, on the other hand, assumes that the risk arises from individual abuse, which is at variance with the macro-prudential approach's concentration on the overall system.

The essential idea in the externality's paradigm is monetary externality. This is described as an externality that occurs when one economic agent's actions have an effect on the welfare of another agent via price effects. When there are distortions in the economy (such as incomplete markets or faulty information), as Greenwald and Stiglitz (Greenwald and Stiglitz, 1986) suggest, policy action can improve everyone's Pareto efficiency. Indeed, a number of scholars have found that when agencies confront loan limitations or other financial frictions, they experience pecuniary externalities and numerous distortions, including over-lending, excessive risk-taking, and high short-term debt levels. In these environments, macro-prudential intervention can improve social efficiency. Risk externalities that propagate from financial institutions to the real economy, are also systemic issues that require macro-prudential intervention.

Previous financial crises started isolated in the financial industry before spreading and become systemic. For example, between 1997 and 2001 there were a few good examples (Russia (1998), Brazil (2000), and Argentina (2001)). Asian crisis began in Thailand, affected Indonesia, and Korea before reaching Asia. Less than 5 percent of total mortgages caused the global financial crisis. Then, when Lehman Brothers went bankrupt, it sent shockwaves across the world. Strong credit growth and big external financial flows are both key ex ante correlations with financial crises, according to evidence, even though many do not result in crisis. External financing of substantial local credit growth, frequently through short-term debt, is the most common mode of transmission. Short-term debt is usually allocated to the least productive businesses (such as real estate). During recessions, external finance would disappear - either abruptly, as in emerging economies, or gradually, as in the Eurozone sovereign debt crisis. Beyond direct exposure, indirect pathways of contagion must also be considered (Clerc et al., 2016). This is especially crucial for the EU, which is a significant part of the global financial system with multiple levels of linkages while preserving domestic macro-prudential control.

Global liquidity and monetary policy can impact both local credit and risk appetite in all important countries. So, to implement EU macro-prudential measures at the same time, national macro-prudential authorities must analyze the connections between their economy and other EU economies, as well as the major global financial centers.

Despite the fact that capital flows have slowed since the global financial crisis, financial institutions continue to play an important role in bringing the global financial cycle home to domestic economies.

Cetorelli and Goldberg show that internationally engaged banks manage their liquidity on a worldwide scale, contributing to shock and international contagion transmission. Funds are actively transferred between parent banks and their subsidiaries throughout the world through an internal capital market. The parent banks transfer liquidity throughout the banking organization when they are afflicted by a shock in their home nation. The money from the foreign affiliated locations are returned to the headquarters and are considered key financing markets in order to cushion the shocks to the parent bank's balance sheet. Other international locations considered key investment markets by the parent bank remain financing destinations because they contribute more to revenue streams.

The existence of a local capital market for global banks, according to Cetorelli and Goldberg, increases the international spread of domestic liquidity shocks due to a substitution effect between domestic and overseas lending. In response to local shocks, banks with limited liquid assets on their balance sheet aggressively utilize cross-border domestic financing, whereas increased domestic financing is related with falling foreign lending. According to the findings, for every additional dollar of domestic loan received from a global liquidity-restricted bank's external offices, external lending drops by 29 cents.

The second key feature of systemic risk associated with banks cross-border activity is how global liquidity circumstances impact leverage and bank risk-taking through currency depreciation and appreciation. Krugman and Cespedes et al. conducted previous research on developing countries and found that depreciation of the national currency might potentially impact domestic activity through effects on the domestic balance sheet.

On the empirical side, the impact of the Mexican peso crisis of 1994 on business investment and finds evidence that weak balance sheets play a role in enhancing the recessionary impact of devaluations in emerging nations. Additionally, when both the foreign exchange and banking crises strike at the same time, local exporting companies with hedged foreign currency debt cut investment, and foreign-owned exporters boost investment despite their foreign currency debt.

Aggregate weakness occurs when the financial industry as a whole is overexposed to the same risks, whether they be credit (borrowers will default), market (collateral values will fall), or liquidity (assets will be difficult to sell or debts will be difficult to refinance) issues.

Macro-prudential policy has distributional effects and has the potential to dramatically restrain market player's conduct. This lays a larger emphasis on communication in order to ensure that the public knows the relevance of the policy goal and how the instruments help in achieving it. Economic agents typically believe that financial risks are lower during times of strength and higher during times of stress, and hence see no motivation to exit (unsustainably profitable) ventures early enough. It is difficult to create communications that send risk warnings to key stakeholders and get them to adjust their behavior in the right way.

Macro-prudential policy includes many measures that can be applied to reduce risks in specific parts of the financial system, if these risks threaten the overall financial stability. Some measures are aimed at increasing the resistance of the financial system to certain risks (eg additional capital requirements for banks), others are more focused on reducing the excessive indebtedness of the population (eg limiting the maximum amount of the average loan payment to the income ratio).

According to Borio (Borio, 2003), macro and micro-prudential approaches have different objectives and understandings of risk. Traditional micro-prudential regulation is concerned with the safety and soundness of financial institutions one by one, while the macro-prudential approach, is concerned with the overall health of the financial system. Furthermore, the risk is exogenous from a micro-prudential standpoint, in the sense that, any possible shock that initiates a financial crisis, originates outside of the financial system's conduct. On the other hand, the macroprudential approach understands that risk variables can be configured endogenously, that is, as a systemic phenomenon. Macro-prudential policy, according to this principle, addresses the links of financial institutions and certain markets, as well as their common predisposition to the same risk factors. It also focuses on the financial system's pro-cyclical tendency in order to promote stability.

3. INSTRUMENTS AND FUNCTIONS OF MACROPRUDENTIAL POLICY

The main purpose of macro-prudential policies is to protect and monitor financial stability and, at this point, it is stated that appropriate instruments are defined to ensure sustainability (IMF, 2012). When we look at the macro-prudential policy instruments applied in the world, we see that they are classified into two main categories as temporal and transversal dimensions. In the time dimension category: Countercyclical capital buffer, dynamic provisions, sector capital adequacy, leverage ratio, loan coverage ratio (LTV), debt income ratio (ITD), liquidity coverage rate and net stable financing rate, requirements Reserve, Guarantees and Deductions, Policy Instruments, namely Denomination Loan Limits, Basic Financing Rate and Fiscal Policies. Regarding the other dimension, the cross-cutting dimension, there are two policy instruments, Systemically Important Institutions (SIFIs) and systemic risk buffer.

The countercyclical capital buffer (CCB) refers to the allocation of additional shares of core capital to prevent the accumulation of risk for the system in the expansionary phases of the economy, contrary to the procyclical behavior of all banks in the world today. In this way, the sustainability of the system will increase, thus, in times of recession, the buffer in question will be dissolved and the credit will be transferred to the system, which will ensure the necessary revival of savings. Therefore, the pro-cyclical behavior of banks leads to the formation of credit cycles,

which in turn have a detrimental effect on financial stability. The prudential policy instrument for the countercyclical capital buffer developed by the Basel III Committee has been integrated into the system to prevent credit cycles. The benchmark set by the committee is that the capital buffer they will reserve can be extended within the specified range, taking into account the economic dynamics and conditions of each country, but its ratio to Credit / GDP should be between 0% and 2.5. %. Its main purpose is to ensure that the capital of banks consists of core capital, which can be considered high quality (FSB, IMF, BIS 2011).

Dynamic Provisions, another macro-prudential policy instrument, was developed on the assumption that bank loans involve risk and their profitability has a potential risk at the time of use. The policy tool Dynamic Provisions, which was first used in Spain, generates a logic that the bank should allocate a potential provision by calculating the risk of non-repayment of the loan in question when using the loan. This will prevent the formation of credit cycles and eliminate any risks from banks' loan portfolios. The rate of provisions set up will be equal to the value of non-performing loans. The purpose was to deal with the procyclicality of the banking system. To limit the expansion of credit and its use to revive the economy in times of contraction, providing a possible reserve formation.

The sector capital adequacy policy instrument, on the other hand, is the additional capital requirement in addition to the existing capital adequacy required by the sectors. The aim is to prevent credit increases that may occur through entrepreneurs in that sector by periodically protecting a risky sector.

Leverage ratio, on the other hand, is the ratio that shows how much of its total assets are financed by loans and is expressed as total debt / total assets. From this point of view, a high leverage ratio is not desirable. Because it is a situation that raises the risk weights of the institution. Therefore, excessive leverage rates will make it difficult for banks to act in the face of an unexpected shock to the economy. In this regard, if banks' asset prices rise, they will seek to provide more cyclical resources and increase their leverage rates. Otherwise, the leverage ratio will be reduced (Adrian et al. 2010). The leverage policy instrument, which also acts as a balance based on the protection of banks' balance sheets, aims to control credit cycles by reducing financial cycles in the expansion phases and increasing them in the contraction phases.

The loan guarantee rate (LTV), on the other hand, includes the limitation that allows you to take out a loan up to a certain percentage of the house price, for example, that you want to take out with a loan. Thus, it offers an increase in the resilience of banks and households in the event of house price fluctuations.

Debt Income Ratio (DTI) also allows households to borrow at a certain rate of their income, preventing the formation of the financial cycle in the economy by controlling their consumption behavior. By granting the right to borrow up to a certain percentage of the income level, the risk of non-repayment or non-repayment of loans with these limitations is also eliminated. In this regard, it is ensured that the loss of the investor is kept to a minimum during fluctuations with large margins in the financial markets and thus losses are prevented before they turn into systemic risks that will create a domino effect.

With the Limits on open foreign exchange positions and foreign currency loans, the aim is to protect the financial system from the devastating effects to which it may be exposed by the incalculable fluctuations of exchange rates. On the other hand, taking into account the balance of external assets and liabilities in banks' balance sheets, this is the process of contributing the net short foreign exchange position to financial stability. On the other hand, the aim is to prevent the expansion of foreign currency lending by reducing dependence on foreign resources and by restrictions on foreign currency lending, which encourages lending in the country's currency (IMF, 2014).

The core financing rate is a precautionary policy instrument created to determine the extent to which banks' resources consist of equity, deposits or long-term debt. With this policy instrument, it is ensured that the core funding rate is increased in periods that coincide with the expansion periods. In times of contraction, which are described as difficult times for the economy, this spare part is intended to be dissolved and to work to revitalize the economy.

Finally, the SIFIs related to the size of the section are based on the possibility of bankruptcy of many so-called companies and banks that do not sink, regardless of their size. However, since it is systemically important, the bankruptcy of institutions with very large international links on a global scale is an undesirable situation in terms of financial stability. For this there are capital obligations imposed on institutions called SIFI. Finally, as a result of structural shocks, including the systemic risk buffer prudential policy instrument, accounting standards or changes in legislation, the ratio of core capital / risk weighting assets should be between 1%. and 3%.

Financial stability refers to an order of the financial cycle. Therefore, it is a mechanism by which all actors in the system, households, companies, the state and various financial institutions do not interrupt their activities and maintain their functionality in a stable manner.

The financial cycle is not defined as a continuous fluctuation of investment instruments stocks, bonds, etc., in short, but as large fluctuations that affect the entire market (BIS, 2016). Although there are many comprehensive

definitions for financial stability, it is not easy to express directly in a single sentence, as it is characterized by its infrastructure that includes the real economy. In general, it can be said that financial stability includes a market formation in which there is no excessive market volatility, the system is free of financial stress and investors feel a confident environment.

Another important concept is systemic risks. Systemic risks have basic structures divided into temporal and transversal dimensions. The first is the systemic risks that accumulate over time and may change depending on the increasing severity of the financial cyclicality. The other is the cross-cutting dimension, which includes the presence and distribution of systemic risk that accumulates at any time (Frait and Komarkova, 2011, p. 97). From this point of view, it should not be understood that eliminating the risks of various financial institutions or ensuring a reliable environment always represents financial stability, as the instabilities in the financial system are not the sum of the instabilities of the institutions.

Transnationalism or financial contamination also creates a spreading effect, causing asset bubbles in the system to grow even more if there is asymmetric information. In other words, it progresses by creating a cycle in the financial markets as system shocks are transmitted to each other in a short time. As an example, the failure of housing loans in the mortgage crisis has left banks in a difficult position, and these banks, which have granted loans, have tried to finance their loans by turning them into hedge funds through investment banks, and the system has has been blocked and exposed to inextricable crises (Demir, et al. 2018).

In order to prevent systemic risks from causing financial crises, both a clear definition of risks and a good knowledge of the types of systemic risk are needed. Most of the time they are not enough and are rebuilt given the flexibility to change the quality of each country according to the economic structure developed or developing.

Evaluation is important! For example, the appearance of asset bubbles (price) or excessive credit bubbles causes the financial system to fluctuate, and then this effect spreads to the real sector and causes the negative effect to be integrated into the entire system through financial contagion as mentioned. above. The last example experienced, as mentioned above, was the American real estate bubble in August 2007 which turned into a global financial crisis.

It can be admitted that the main components of all financial crises, as mentioned above, are due to the failure of the control and supervision mechanism to be developed through contagion and excessive credit expansion. At this point, developed and developing countries have gradually incorporated macro-prudential policy instruments into their monetary policies and have sought to develop a new perspective, with inclusive and supportive interactions with both fiscal and competition policy and microprudential policies. It is argued that macroprudential policies have significant advantages when combined with macroprudential and other economic policies.

First, prudential policies are said to be less harsh than monetary policy instruments. On the other hand, it is said to be more flexible compared to fiscal policy instruments such as public spending and taxes. Among the reasons why it is preferred, the common opinion of many authorities in the country is that it is an effective policy, as it offers quick solutions to relatively minimal economic crises and is simple and straightforward to implement (Lim et al., 2011).

4. CONCLUSIONS

Nevertheless, global financial integration has grown, bringing new political challenges for macro-prudential authorities in open markets. Despite the fact that the global financial crisis has delayed global financial integration, the degree of interconnection is significantly more than it was 30 years ago. This could also contribute to enhanced risk sharing and more effective capital allocation. But, increasing economic interconnectedness, may risk national economies to transmissions from other nations, and international capital flows may facilitate the accumulation of systemic vulnerabilities in the financial system. This are real challenges for macro-prudential regulators, to solve the vulnerabilities that came with financial globalization.

By creating new institutions and a new set of instruments, like the countercyclical capital buffer, regulatory reform has aimed to strengthen the function of macro-prudential regulation (both at national and transnational level). In comparison to the years before to the global financial crisis, this has resulted in a significant increase in the employment of macro-prudential instruments.

Macro-prudential policy can be considered a set of rules and measures that aim to reduce the risks of financial crises, namely the risk that certain parts of the economy become fragile and insolvent, as a result of which participants discontinue their activities. There are several basic features of macro-prudential policy, including: risk reduction, the existence of specific instruments and their use, ensuring financial stability and relationships with other institutions.

Compared to other policies such as monetary or micro-prudential surveillance, where the objectives and characteristics are quite clear, in the case of macro-prudential policy, things are in a continuous development both at national and European level. If we were to draw a parallel between monetary and macro-prudential policy, in the case of monetary policy, its objectives are much better known, such as price stability. So are monetary policy instruments, such as the reference rate against which rates in the banking system are guided. The macro-prudential ones are less known and more varied, from capital requirements to indebtedness limits.

Macro-prudential policy is based on micro-prudential regulations and rules, and yet, when fluctuations occur and participants are exposed to risk, micro-prudential policy regulations are not sufficient. Thus, the macro-prudential policy needs to take into account situations that are generally ignored by the micro-prudential policy, given the relations between market participants, between banks and other participants, and to focus on other segments regarding its insurance. pension funds. Therefore, the macro-prudential policy is different from the micro-prudential one and its regulations. When we talk about macro-prudential policy, it must be understood that it is an analysis of the financial system at the aggregate level and not at the level of a single institution or organization. Also, in terms of macro-prudential policy, the entire financial system is analyzed, not just commercial banks. The macro-prudential policy was developed to emphasize the relations between the market participants and on the way of their operation on the market, preventing the negative situations that would produce major damages.

Macro-prudential policies aim to:

- preventing the excessive accumulation of risks generated by external factors and market deficiencies, in order to mitigate the fluctuations of the financial cycle (temporal dimension);
- increasing the resistance of the financial sector and limiting the effects of contagion (transversal dimension);
- encouraging a system-wide perspective in the field of financial regulation, in order to create an appropriate set of incentives for market participants (structural dimension).

Even the most effective macro-prudential regulations will not be able to avoid every financial crisis. As a result, a strong and flexible lender of last resort – usually a central bank – is required to alleviate temporary liquidity shortages, as well as credible mechanisms to resolve or shut failed financial institutions. Furthermore, macro-prudential policy is not a one-way street. A stable climate favorable to a healthy financial system requires sound monetary, taxing, and spending policies.

References

[1] A Crockett, “Marrying the micro- and macro-prudential dimensions of financial stability”, 2000, available at: “https://www.bis.org/publ/bppdf/bispap01.pdf”.
[2] Adrian, T. ve Shin, H.S. (2010). “Liquidity and Leverage”.
[3] P Clement, 2010 “The term macroprudential: origins and evolution”, BIS, pp 59–65.
[4] BIS, 2018, Annual Economic Report, “Moving forward with macro-prudential frameworks”, available at: “https://www.bis.org/publ/arpdf/ar2018e4.pdf”
[5] BIS, 2020 Annual Economic Report, “A monetary lifeline: central banks' crisis response”, available at: “https://www.bis.org/publ/arpdf/ar2020e2.pdf”
[6] BIS (2016). Annual Report, available at: “https://www.bis.org/publ/arpdf/ar2016e.pdf”
[7] C Borio and F Restoy, 2020, “Reflections on regulatory responses to the Covid-19 pandemic”, FSI Briefs, no 1.
[8] Caballero, J., 2016, “Do surges in international capital inflows influence the likelihood of banking crises?”.
[9] Cetorelli, N. and Goldberg, L., 2012a, “Liquidity management of U.S. global banks: internal capital markets in the great recession”.
[10] Cetorelli, N. and Goldberg, L., 2012b, “Banking globalization and monetary transmission”.
[11] Cespedes, L.F., Chang, R. and Velasco, A., 2004, “Balance sheets and exchange rate policy”.
[12] ESRB, 2014, “Allocating macro-prudential powers”, available at: https://www.esrb.europa.eu/pub/pdf/asc/Reports_ASC_5_1411.pdf.
[13] ESRB, 2020, “The global dimensions of macro-prudential policy”.
[14] IMF, 2019, “Working Paper, No 19/66”.
[15] IMF, 2011, “Economic Review, Vol. 59, No 2”.
[16] IMF,2011, Macroprudential Policy: What Instruments and How to Use Them? Lessons From Country Experiences, available at: “https://www.imf.org/external/pubs/ft/wp/2011/wp11238.pdf”.
[17] Stefan Gerlach,2012, “Macro prudential policy in Ireland”, available at: https://www.bis.org/review/r120301d.pdf.
[18] Vitor Constancio, 2014, “Making macro-prudential policy work”.
[19] https://yamm.finance/wiki/Macroprudential.html.

Student Perceptions of Service Quality in a Multi Campues University Management: Evidence of Higher Education in Beijing

Luming WU [a*], Khunanan SUKPASCHAROEN [b]

[a] *Chakrabongse Bhuvanarth International Institute for Interdisciplinary Studies, Rajamangala University of Technology Tawan-ok. E-mail:luming.wu@rmutto.ac.th*

[b] *Chakrabongse Bhuvanarth International Institute for Interdisciplinary Studies, Rajamangala University of Technology Tawan-ok. E-mail: khunanan_su@rmutto.ac.th*

Abstract

The current study aims to study the impacts of multi-campus management on higher education. Two research questions are formed, which are 'What are the current issues of Student perceptions of service quality in a multi-campus university management: Evidence on Higher Education in Beijing?' and 'What are the influence factors of Student perceptions of service quality in a multi-campus university management: Evidence on Higher Education in Beijing?'. Quantitative method has been used and descriptive statistic is used for analysis. The findings revealed that students in multi campus in Beijing have relatively lower satisfaction towards the service quality of their schools, and students in multi campus in Beijing have highest concerned in the factors of Empathy, followed by Reliability, Responsiveness, Tangibility, Assurance. Future studies are recommended to add in the variable of the year of the students.

Keywords: Multi-campus management**,** Service Quality, Higher Education,Beijing

1. INTRODUCTION

1.1 Background of the Study

Higher education in China has seen significant changes since the late 1990s, with a key policy called increasing enrolment and restriction, in particular, having a profound impact on the process of higher education in China as well as on the number of students enrolled at Chinese universities. The idea of expanding enrolment was hatched in 1998 and implemented publicly in 1999. The number of college students in China has risen to 25 million as of the year 2006. Currently, the gross enrolment rate in higher education is 22 percent (Fei, 2015). Based on these numbers, China has advanced to the popular stage of higher education and has risen to the status of a major nation of the world in the field of education. Due to the increasing demand for higher education resources and the enormous market, as well as China's development trend in higher education, colleges and universities are expropriating land to build new campuses in order to meet the growing demand for high-quality higher education among the general public in the country.

Geography frequently plays a part in the establishment of affiliate campuses, which are typically selected by a board of trustees or regents, which is in charge of overseeing public financing for new state schools (Ma, 2009). A university system is sometimes referred to as a multi-campus institution, with its main campus acting as the central site and satellite campuses servicing communities that are geographically dispersed throughout a state or area of the

* Corresponding author.

country. Each campus develops a particular emphasis, personality, and areas of expertise that distinguish it from the others.

1.2 Problem Statement

China boasts the world's largest educational system. With almost 260 million pupils and over 15 million instructors in around 514 000 schools (National Bureau of Statistics of China, 2014), China's education system is not only vast but also diversified. Education is predominantly state-run, with minimal private sector engagement in the educational system, and is becoming increasingly decentralised. Decentralisation is a phrase used to describe the transfer of responsibility and authority to local communities and schools. They will subsequently be able to make their own judgments on a variety of policy and practise issues. In centralised systems, a central authority may have control over finances, people, and resources, as well as management of policy, curriculum, and assessment procedures (Feng, 2009). According to several studies, resources can be utilised more efficiently in decentralised systems. The result of this might be enhanced student performance, increased parental satisfaction, and increased accountability as a result of increased community engagement and support. Decentralized management refers to the lateral leadership of the campus as opposed to the central management. Typically, it is under the control of the main campus' unified management, and branch campuses exist at one or more colleges with varying degrees of relative independence from the central campus (Feng, 2009). This structure is appropriate for the comprehensive university, also known as a combined university, because it includes numerous subjects and is tough to administer.

1.3 Research Questions

a) What is the current issues of Student perceptions of service quality in a multi-campus university management: Evidence on Higher Education in Beijing?

b) What are the influence factors of Student perceptions of service quality in a multi-campus university management: Evidence on Higher Education in Beijing?

1.4 The Benefits of the Research

The current study will be benefiting the educators that are from the management. This is because the current study will analyse the factors that affecting multi campus and the benefits and challenges of the multi-campus, which allows the educators from the management have a blueprint on the future management of the campus of higher education.

1.5 Scope of the Research Study

The current study is employed quantitative study which it could know impacts of service quality on multi campus management. 400 respondents from universities in multi campus in Beijing, would be recruited and involved in the study to collect data as to answer the research questions and fulfilled the research objectives.

2. LITERATURE REVIEW

2.1 Perception

To begin with, the costs of construction are high. In most cases, this refers to the cost of constructing the university's new campus, which includes pre-land acquisition costs as well as planning costs, design costs, construction costs, and equipment costs (Lanmin, 2013). These costs can range from hundreds of millions of dollars to over a billion, and in some cases, multiple billions. The major reason for this is because new campuses are generally located outside of downtown and need a considerable investment in infrastructure, such as water, electricity, heating, and other utilities, before they can be used. In addition, tightening Chinese macroeconomic conditions, price inflation, and a jump in interest rates as a result of external factors may all contribute to an overspending situation. As a result, there is insufficient funds to complete the planning process (Lanmin, 2013). Second, costs connected with logistics and other forms of assistance are incurred and reported. Costs associated with transportation and communication due to the distance between campuses, repeated purchases of experimental equipment, textbooks and other materials, duplication costs associated with hospitals, canteens, logistical and other institutions, and comparable personnel costs, are just a few examples. For example, shuttles transport students between the main campus and the branch campuses (Lanmin,

2013). Typically, it occurs six times each week, with each round trip taking around half a day to complete. Only the transportation expenses continue to rise exponentially year after year. Additionally, the structure of several campuses creates an additional burden on professors and students. Teachers are required to travel between campuses. In order to make it to the bus stop on time, they must get up early and come home late. Teachers may experience nervousness and anxiety as a result of this. When the weather is bad, the slow pace of the shuttle may cause the normal flow of teaching to be disrupted.

Five unique types of campus management models were discovered throughout the research, each of which was categorised according to the degree of autonomy granted to the campus head (Fraser & Stott, 2015). It is possible to operate in a model where the local operation has minimal autonomy, but operating in a model where a unit is largely self-contained inside the parent organisation is possible. These models are summarised in the next section. In order to conduct business with students on a local level, the Study Centre idea has been developed. It has only a sliver of autonomy and may be lacking in local governance. The majority of the time, it is strictly a teaching position. The faculties are generally in charge of making decisions, and the campus head has little authority over the commercial operation (Fraser & Stott, 2015). However, top campus personnel may have substantial influence in the neighbourhood around the school. It is only with limited control that funds and activities are monitored, and any commercial concerns are addressed by the main campus or faculties. Campus-specific marketing possibilities are limited, and the campus head may hold a position in the university hierarchy that is below that of the rest of the faculty. In some cases, decisions made by the central administration may have a significant and negative impact on the functioning of the campus. There are a number of different variations. In certain cases, the campus head is given greater autonomy, allowing him or her to have some influence over commercial decisions, while in others, the campus head is given responsibility for academic staff and programmes. Some campuses have a chief operating officer who is also a member of the university's senior management team; for example, at one school we visited, the chief operating officer was a deputy vice chancellor; at another, the chief operating officer was a faculty dean. Some schools have recently promoted the position of head of campus to that of associate vice-chancellor. Even while big titles may be symbolic, they do not always have an impact on the company's performance. The Matrix method puts the college president in complete control of the campus's financial outcomes (Fraser & Stott, 2015).

2.2 Administrative Management Theories

According to Administrative Theory, departmentalization is a concept that explains how a large number of activities essential to achieve an organization's common purpose should be identified and classified into different groups or departments in order to ensure that the work is performed effectively (Says, 2016). His belief that a greater emphasis should be placed on organisational management and the human and behavioural elements that impact administration led to the development of administrative theory. Henri Fayol is credited with developing administrative theory. Accordingly, unlike Taylor's scientific management theory, which placed emphasis on increasing worker efficiency and reducing task time, the primary focus here is on how well the organization's management is structured, as well as how well the individuals within it are organised to accomplish the tasks that have been delegated to them. The primary distinction between administrative theory and operational theory is that administrative theory begins by increasing management efficiency in order to standardise procedures and then progresses to the operational level, where individual employees are required to understand and implement the changes in their everyday responsibilities. While scientific management theory emphasises improving worker efficiency at the operational level first, which in turn improves managerial efficiency, traditional management theory emphasises increasing worker efficiency at the strategic level first (Says, 2016). As a result, administrative theory is top-down, whereas scientific management theory is bottom-up.

***2.2.1** Administrative theory by Henri Fayol*

Henry Fayol established 14 broad management principles to help managers who, at the time, did not have a scientific approach to management.

a. Initiative:

An initiative is the degree of freedom that an organisation should provide its employees in order for them to carry out their ideas without being forced or ordered to do so. This relates to instilling interest and desire in employees through motivation and satisfaction.

b. Equity:

This idea suggests that all organisation members should be treated equally. There should be no prejudices and a climate of love and fairness.

c. Chain scalar:

According to the hierarchy level, there should be a chain of superiors extending from the highest level of management to the lower level of management. The organization's leader is at the top of the food chain. Communication goes from top to bottom via this chain of superiors' power. However, there is no hard and fast rule governing the manner in which information is sent over the scalar chain.

d. Personnel remuneration:

Employees must be both financially and non-financially for their performance. Fayol places a higher premium on non-monetary remuneration, which he feels strengthens the relationship between the individual and the business. As a result, remuneration must be equitable, reasonable, and gratifying.

e. Directional Consistency:

According to this idea, there should be a single manager overseeing and planning the progress of groups with similar aims and objectives. This idea implies that each division within a department or sector should receive guidance from a single head. This assists in organising group effort toward a common objective.

f. Discipline:

Employees should be obedient and respectful to their superiors and the organization's set norms and regulations. Discipline may be maintained in a variety of ways. Clarity of rules, a reward-punishment system, and enough monitoring are just a few examples. However, how discipline is maintained is determined by the organization's needs and policies.

g. Work Division:

This idea says that management's overall actions should be compartmentalised into compact occupations and that people should be assigned specific jobs based on their interests and talents. This approach promotes specialisation and increases worker effectiveness and efficiency. Division of labour is critical for an organization's seamless operation at both the technical and management levels.

h. Authorization and accountability:

The right to issue commands and make judgments is referred to as authority. Responsibility refers to an employee's responsibility to complete a certain assigned work and report to their supervisor. There should be a healthy mix of authority and accountability. An employee must be granted the authority necessary to carry out the assigned duty. Without accountability, authority results in position waste and inefficient use of power, whereas accountability without authority results in inefficient use of human and other resources.

i. Unification of Command:

A single direct supervisor must provide commands to an employee. Additionally, the employee's accountability should be limited to his or her direct supervisor. There should be no other supervisors guiding the individual. This will assist in dispelling uncertainty and instil a sense of loyalty in the employee for the activity.

j. Individual Interests Are Subordinate to the Public Interest:

Interests are classified into two categories. One is the individual's interest, while the other is the organisational interest. As a result of this concept, there must be a balance between these two interests. Organizational interests must be prioritised since doing good for the organisation benefits the individual.

k. Centralization:

This idea suggests that authority at the highest level should be concentrated in the hands of top-level management. While authority should be delegated to subordinates, the authority to make critical organisational choices should stay with top-level management.

l. Order:

This idea argues that each piece of equipment and labour should have a designated location inside the organisation. The proper person for the appropriate position is critical to an organization's success. As a result, management must prioritise activities and allocate scarce people and other resources appropriately.

m. Tenure Stability:

Any employee may work to their maximum potential if their employment is secure. As a result, an employee's job stability is critical to their efficiency. This benefits the company as well, since it minimises labour turnover and the costs associated with hiring and training new personnel.

n. Corps esprit:

This concept entails the notion that "unity is strength" and a sense of team spirit. Thus, the organization's efforts must be directed toward a single purpose and objective. If their actions are not coordinated, they will fail to accomplish their goals. As a result, there must be a cohesive team effort that is always larger than the sum of individual performances.

2.3 Multi-Campus in China

In China, three common forms of multi-campus administration exist.

***2.3.1** Mode of administration that is centralised.*

In other words, the branch campus houses its subordinate colleges under the unified management of the core campus (main campus), and the core campus organises and manages the teaching organisation and management, thereby forming the organic coordination of the core campus, the branch campus, the college, and the department. Its benefit is that all levels of management are clearly accountable, as a result of the mix of centralised and decentralised management; the downside is that, owing to the geographical separation of each campus, it is possible to result in disorganised and inefficient management.

***2.3.2** Mode of administration that is decentralised.*

That is, while the central campus coordinates everything, each campus as one or more colleges is largely autonomous, with its own set of administration systems. Its benefit is that each college has a high degree of autonomy, which allows for the expression of discipline features. The disadvantage is that it is simple to waste instructional resources, and certain significant comprehensive scientific research initiatives are constrained.

***2.3.3** The mixed management mode.*

This is an organic synthesis of the previous two management approaches. On the one hand, it has aided in the consolidation of resource allocation and management. Increased excitement in each school district is favourable to resource revitalization. On the other side, management expenses grow when building, transportation, and communication expenditures are repeated. Simultaneously, coordination is difficult, limiting management efficiency

3. METHODOLOGY

3.1 Research Method

***3.1.1** Quantitative method*

The current study is using quantitative method with survey method. A survey is a type of study that collects data from a set group of respondents in order to gather insight and information about a variety of topics of interest. They can serve a variety of functions, and researchers can approach them in a variety of ways, depending on the technique used and the study's objective. A survey is a type of study that collects data from a set group of respondents in order to gather insight and information about a variety of topics of interest. They can serve a variety of functions, and researchers can approach them in a variety of ways, depending on the technique used and the study's objective.

3.2 Sample

The current study has recruited 400 participants in the current study. They are all the students from Beijing University that are having multi campus. The current study will be using quota sampling. Quota sampling is a technique for selecting non-probabilistic samples. This indicates that components of the population are picked non-randomly and that not every member of the population has an equal probability of being chosen to be a member of the sample group. Indeed, with quota sampling, each sample group will be a multi campus university in Beijing and each of them will include 50 students. The university that are having multi campus in Beijing are:

Table 3.1 Sample from Different Universities

University	Number of Sample
Peking University	50 Students
Tsinghua University	50 Students
North China Electric Power University	50 Students
Beijing University of Technology	50 Students
University of Chinese Academy of Social Sciences	50 Students
Capital University of Economics and Business	50 Students
Beijing Union University	50 Students
North China University of Technology	50 Students

3.3 Data Collection

The current study will be collecting the data through the surveys. The surveys will be distributed to the students in the eight multi campus universities in Beijing. The survey will be consisted several questions and the answers of the students which are the responders will be data of the current study. The data collection is through survey and the survey is distributed into few parts, the first part is the demographic form that used to understand the personal information of the respondents and the second part is to about the service quality. The scale of the service quality in the current study is adopted from Shafiq, Lasrado, and Islam (2018). The scale will have five factors for 29 items in total that are involved which are Reliability (R), Tangibility (T), Responsiveness (RS), Assurance (A) and Empathy (E). All these are related to different items and representing different aspect of the education service quality, the items could be referring to the appendix. Then, the student satisfaction scale are used, there are 29 items in total to measure the satisfaction of the students towards their service quality in multi campus. The full scale of questionnaire is attached in appendix.

3.4 Data Collection Procedure

Distribution of the survey,
Demographic form are sent.
Students asked to filled up the surveys.
Data collected.

3.5 Data Analysis

Firstly, this study has analysed the reliability of the collected data with running Cronbach Alpha, which if it is above 0.70, it is a reliable scale that is appropriate to use in this study. The current study used the descriptive analysis to analyse each factor that are affecting the perception of the students of the service quality. In other word, this study

is using mean of the score of each scale that are represented service quality satisfaction to understand which are factors that are most concerned by the students in term to affect the satisfaction of the students. SPSS is used for running the descriptive analysis.

3.6 Research Framework

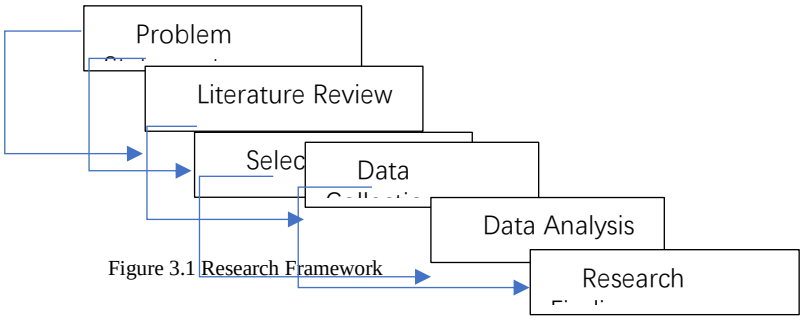


Figure 3.1 Research Framework

4. RESULT ANALYSIS

4.1 Analysis Results

Table 4.1 Reliability Test

Scale	Cronbach Alpha
Reliability (R)	0.92
Tangibility (T)	0.87
Responsiveness (RS)	0.79
Assurance (A)	0.71
Empathy (E)	0.82

Based upon the data that are collected and analysed by running Cronbach Alpha, the general reliability of the scale that are consisted five aspects are in a good context, which its Cronbach's Alpha is 0.74. This is made up by Reliability (R) factor in service quality, which consisted of 7 items. It has a very good reliability which its Cronbach Alpha's has reached 0.92; Tangibility (T) factor in service quality, which consisted of 5 items, it has a very good reliability which its Cronbach Alpha's has reached 0.87; Responsiveness (RS) factor in service quality, which consisted of 6 items, it has an accepted reliability which its Cronbach Alpha's has reached 0.79; Assurance (A) factor in service quality, which consisted of 4 items, it has an accepted reliability which its Cronbach Alpha's has reached 0.71; and Empathy (E) factor in service quality, which consisted of 4 items, it has a good reliability which its Cronbach Alpha's has reached 0.82. This means that the scale for analysis is reliable.

Table 4.2 Gender

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Males	209	52.3	52.3	52.3
	Females	191	47.8	47.8	100.0
	Total	400	100.0	100.0	

The current study has 400 respondents that are fulfilled the recruitment criteria. All of the 400 respondents are students from Beijing multi campus university. The current study is to identify the influence factors of student perceptions of service quality in a multi-campus university management: evidence on Higher Education in Beijing and so only students from multi campus university in Beijing are included. All of the 400 respondents are students from Beijing multi campus university. The current study has included 209 males' respondents and 191 females' respondents. With so, the males' respondents have accounted for 52.3 percent of the total sample in this study which females' respondents have accounted for 47.8 percent of the total sample. This could be discussed detail in later section for the discussion because gender could always be a component to influence the satisfaction towards education service quality (Joshanloo & Jovanović, 2019).

Table 4.3 Descriptive Statistic

Descriptive Statistics

	Mean	Std. Deviation	N
R	28.3075	4.66448	400
T	20.3675	3.27249	400
R	23.6525	3.54587	400
S			
A	16.0775	2.15362	400
E	29.4050	3.18926	400

Respondents have highest concerned in the factors of Empathy (M=29.41, SD= 3.19), followed by Reliability (M=28.31, SD=4.66), Responsiveness (M=23.65, SD=3.27), Tangibility (M=20.37, SD=3.27), Assurance (M=16.08, SD=2.15). This means that students most concerned about the factors according to that and have a higher expectation to the factors that they are concerned about. The results as per shown, the mean of satisfaction of the students is 85 for 29 items, which the lowest score is 70 in total for 29 items and 98 as the highest score for 29 items. This study is using five points for rating and taking the mean score of satisfaction 85 for 29 items, it is 85/29= 2.93. In five-point rating scale, it is relatively stick to the low satisfaction towards the service quality of their schools.

4.2 Summary of Findings

Students in multi campus in Beijing have relatively lower satisfaction towards the service quality of their schools. Students in multi campus in Beijing have highest concerned in the factors of Empathy, followed by Reliability, Responsiveness, Tangibility, Assurance.

5. CONCLUSION

5.1 Findings aligned to Research Questions

RQ1: What are the current issues of Student perceptions of service quality in a multi-campus university management: Evidence on Higher Education in Beijing?

Findings: Students in multi campus in Beijing have relatively lower satisfaction towards the service quality of their schools.

RQ2. What are the influence factors of Student perceptions of service quality in a multi-campus university management: Evidence on Higher Education in Beijing?

Students in multi campus in Beijing have highest concerned in the factors of Empathy, followed by Reliability, Responsiveness, Tangibility, Assurance.

5.2 Discussions

Students in multi campus in Beijing have relatively lower satisfaction towards the service quality of their schools. Firstly, this could because the current study has more males' respondents compared to females respondents. The current study has included 209 males' respondents and 191 females' respondents. With so, the males' respondents have accounted for 52.3 percent of the total sample in this study which females' respondents have accounted for 47.8 percent of the total sample. Studies have found that female students tend to rank their educational satisfaction higher than their male counterparts, according to previous findings (Tessema, Ready & Malone, 2012). The fact that female students have a tendency to be more optimistic and forgiving in temperament than male students might be one probable explanation. Some of the probable causes for the difference in satisfaction between male and female students might be related to female students' value systems, which tend to be more favourably forgiving in their judgments than male students (Chee, et al., 2005, as cite in Tessema, Ready & Malone, 2012). Female students, tend to feel more supported by their professors (both intellectually and personally) than male students, which adds significantly to their higher overall satisfaction with their college experience. According to social capital theory, female students are more likely than male students to believe that their professors provide them with personal and professional support, which accounts for higher levels of satisfaction with faculty, curriculum, and the overall sense of community on campus among female students (Tessema, Ready & Malone, 2012). Female students place a higher emphasis on the educational benefits of college than male students when they first enrol in college. In the origins of gender disparities may be traced back to the pre-college years, during which women and men acquire very different beliefs, confidence,

goals, and behavioural pattern (Tessema, Ready & Malone, 2012). According to the findings above, female students are more likely than male students to see education as a method of influencing social change and advancing their positions in the labour field after graduation.

From the view of the management, students in multi campus in Beijing have relatively lower satisfaction towards the service quality of their schools. Student satisfaction is a crucial concern for higher education institutions. Student satisfaction was a crucial performance measure for higher education institutions, with many universities establishing stringent quality assurance methods. Many institutions wanted to increase accountability by "streamlining procedures and enhancing services to students, professors, and staff." This was their objective (Al-Sheeb, Hamouda, & Abdella, 2018). There has been various research on the relationship between student satisfaction and higher education service quality. Another major reason that student satisfaction is of relevance is that disgruntled students commonly withdraw during their first year at college (Al-Sheeb, Hamouda, & Abdella, 2018). It was a waste of both human and financial resources when current students were not retained, and it was a big source of worry for important stakeholders such as higher education leadership students and parents.

Astin's Input-Environment-Output (I-E-O) model aims to explain links between input, environments and output. Astin stated that student results were a consequence of three crucial components. Firstly, inputs, which relates to the student precollege background features. Then, environment, which refers to the many experiences given on campus such as programmes, policies, education, and social events. Lastly, outcomes relate to student perseverance, achievement, and satisfaction. Astin noted that growth is intimately tied to students' interaction with their peers, academicians and academic programmes. Indeed, the five factors that have mentioned above, the highest concerned for the students in multi campus in Beijing is about the empathy. Empathy is then referring to the culture of the campus as well as the supportive level of the faculty. In other words, it is about the belonging and supporting atmosphere. However, Fei (2015) has mentioned that multi campus in China has actually led a lower belonging to the students. This could then lead to a lower satisfaction to them. Some multi campus has actually required the students to travel between the campuses and this might make the students to feel that it is difficult to reach to the faculty and so the influence factor of empathy scored the high but the students study at multi campus in Beijing have a lower satisfaction.

The second factor that the students in multi campus in Beijing care about is reliability, which reliability of the service quality in the scale items in this study are highly related to the course content. With it, based on the Astin's Input-Environment-Output (I-E-O) model, the community which is the environment of the content course will then be important to delivers a qualified course content, which means it is a high need for getting a reliable and qualified lecturer to be in the school for reliable content course. However, it is actually a very high cost in recruiting lecturers, especially with experienced and high qualification, and this makes multi campus always lack of educators because they would need a larger number of educators to support (Subedi, 2019). In term of that, due to high cost and financial difficulties of the multi campus compared to those only have a main campus, it is relatively higher costs and more difficult for the management of the multi campus to increase their quality in such factors.

5.3 Recommendations given to the industry

Based on the discussion above, the current study is recommended the management of the multi campus has invested more in faculty and lecturers. The ability, quality, coordination, and reasonability of instructors have a significant impact on students' class performance (Palli & Mamilla, 2012). The educational activities that their instructor organises for them have a significant impact on the pupils' lives. Students' interest in their organisation will be clearly maintained if they believe that the institution's quality and standardised learning environment has supported their intellectual advancement and that sufficient learning and infrastructural facilities have been supplied. Since the multi campus in Beijing faced the financial issue in running several multi campus, it is better to invest in the most concerned factor of the students in term to raise their satisfaction, which then this study recommended to invest more the management of the multi campus has invested more in faculty and lecturers to deliver a better service quality.

5.4 Limitations & Future Studies

The current study has the limitation of controlling the year of the students. There are always a different perception and experience of the students that are in first year, and later year. The study mentioned that first year students will always drop out from the university and choose another that they think suitable for. However, in this study, the researcher is just controlling that the students are from multi campus in Beijing but not their year in the university. Hence, this might lead to a covariance of the results, and so future studies are recommended to add in the variable of the year of the students.

References

[1] Al-Sheeb, B., Hamouda, A. M., & Abdella, G. M. (2018). Investigating determinants of student satisfaction in the first year of college in a public university in the state of Qatar. *Education Research International, 2018*, 1-14. doi:10.1155/2018/7194106.

[2] Dhliwayo, K. (2014). The internal customers perceptions of a multi-campus university system in Zimbabwe. a case of great Zimbabwe University. *International journal of scientific & technology research, 3*(2), 324-330.

[3] Fei, M. E. N. G. (2015). Problems Caused by the Management of Multi-Campus University in China. *Higher Education of Social Science, 8*(4), 60-63.

[4] Fei, M. E. N. G. (2015). Problems Caused by the Management of Multi-Campus University in China. *Higher Education of Social Science, 8*(4), 60-63.

[5] Feng, W. A. N. G. (2009). A Probe into Management Modes of Centralization and Decentralization in Multi-campus Universities. *Journal of Hainan Normal University (Social Sciences), 2*.

[6] Fraser, D., & Stott, K. (2015). University satellite campus management models. *Australian Universities' Review, The, 57*(2), 79-83.

[7] Groenwald, S. L. (2018). The challenges and opportunities in leading a multi-campus university. *Journal of Professional Nursing, 34*(2), 134-141.

[8] Gu, Y., Zhao, J., Herzog, T., Mao, Q., & Latz, P. (2019). Exploring the space use mechanism of high-density campus in urban Beijing. *Habitat International, 91*, 102024. doi:10.1016/j.habitatint.2019.102024.

[9] Hamis, A. (2021). Full notes on educational management and administration what is management. Retrieved September 12, 2021, from https://www.academia.edu/33026589/FULL_NOTES_ON_EDUCATIONAL_MANAGEMENT_AND_ADMINISTRATION_What_is_Management.

[10] Hjelsvold, R., & Bahmani, A. (2019). Challenges in repurposing single-campus courses to multi-campus settings. *Læring om læring, 3*(1).

[11] Hongcai, W. (2007). On the Management of Multi-Campus Universities: Problems and Outlets [J]. *Modern University Education, 4*.

[12] Joshanloo, M., & Jovanović, V. (2019). The relationship between Gender and Life Satisfaction: Analysis across demographic groups and global regions. *Archives of Women's Mental Health, 23*(3), 331-338. doi:10.1007/s00737-019-00998-w.

[13] Lanmin, G. U. (2013). The thoughts on the scientific management of the operating costs of multi-campus universities. *Higher Education of Social Science, 4*(1), 27-30.

[14] Ma, W. (2009). The prospects and dilemmas in Americanizing Chinese higher education. *Asia Pacific Education Review, 10*(1), 117-124.

[15] Palli, J. G., & Mamilla, R. (2012). Students' opinions of service quality in the field of higher education. *Creative Education, 03*(04), 430-438. doi:10.4236/ce.2012.34067.

[16] Pinheiro, R., & Nordstrand Berg, L. (2017). Categorizing and assessing multi-campus universities in contemporary higher education. *Tertiary Education and Management, 23*(1), 5-22.

[17] Reeves, S., Peller, J., Goldman, J., & Kitto, S. (2013). Ethnography in qualitative educational research: AMEE Guide No. 80. *Medical teacher, 35*(8), e1365-e1379.

[18] Says, C. (2016, June 13). What is ADMINISTRATIVE Theory? Definition and meaning - BUSINESS JARGONS. Retrieved September 12, 2021, from https://businessjargons.com/administrative-theory.html.

[19] Shafiq, M., Lasrado, F., & Islam, A. (2018). Service Quality scale Development for Higher Education Institutions: The Asian Context. *J. Qual. Technol. Manag, 15*, 37-55.

[20] Snyder, H. (2019). Literature review as a research methodology: An overview and guidelines. *Journal of Business Research, 104*, 333-339. doi:10.1016/j.jbusres.2019.07.039.

[21] Subedi, D. (2019). In lack of textbooks, college students rely on online resources. Retrieved December 23, 2021, from https://myrepublica.nagariknetwork.com/news/in-lack-of-textbooks-college-students-rely-on-online-resources/.

[22] Tessema, M., Ready, K., & Malone, C. (2012). Effect of gender on college students' satisfaction and achievement: The case of a midsized Midwestern public university. *International Journal of Business and Social Science, 3*(10).

[23] Wu, Y., & Wu, Z. (2013, June). A Study on Influencing Factors and Countermeasures in Management of Multi-campus Universities. In *2013 Conference on Education Technology and Management Science (ICETMS 2013). Atlantis Press*.

[24] Wu, Y., & Wu, Z. (2013, June). Management of Multi-campus Universities in American and its enlightenment on Chinese Multi-campus Universities. In *Anais da International Conference on Education Technology and Management Science (ICETMS 2013)*.

APPENDIX A

Item Measurement

NO	ITEM	DIMENSION
1	During the teaching process students should be involved.	Reliability
2	Relevant case studies should be discussed.	Reliability
3	Learning level should be determined in advance.	Reliability
4	Students should learn what they hoped to learn.	Reliability
5	Students' communication skills should be developed.	Reliability
6	Course contents should be up to date with national and international standards.	Reliability
7	Students should be given guideline about the selection of courses.	Reliability
8	The laboratories should have latest equipment and facilities.	Tangibility
9	Relevant to subject, lab fail it should be provided to the students.	Tangibility
10	Computer lab facility should be provided to the students.	Tangibility
11	Up to date computers should be in computer lab.	Tangibility
12	Comfortable furniture should be there in the classrooms.	Tangibility
13	Class notes and reading martial should be available online.	Responsiveness
14	Class announcement should be done through email etc.	Responsiveness
15	The proper channel should be established to receive feedback from students about teachers and other facilities.	Responsiveness
16	Students' queries should be responded quickly.	Responsiveness
17	Results should be readily available on the web.	Responsiveness
18	Results should be declared within the stipulated time.	Responsiveness
19	Knowledge should be up to date.	Assurance
20	Proper SOP's are followed for teaching, examination and admission.	Assurance
21	All administrative matters should be followed according to the university regulations.	Assurance
22	Quality of teaching should be evaluated fairly.	Assurance
23	The faculty attitude should be comparative and supportive.	Empathy
24	Academic culture should be promoted.	Empathy
25	Alumni follow up services should be provided.	Empathy
26	There should be a liaison between students and university authorities.	Empathy
27	The university management should be willing to listen the opinion of students.	Empathy
28	The proper channel should be established to receive feedback from students about teachers and other facilities.	Empathy
29	Celebrations of different events should be conducted.	Empathy

APPENDIX B

Survey

How important is this item in university's service quality?

1: Not important at all

2: Slightly important

3: Important

4: Fairly important

5: Very Important

ITEM	1	2	3	4	5
1. During the teaching process students should be involved.	1	2	3	4	5
2. Relevant case studies should be discussed.	1	2	3	4	5
3. Learning level should be determined in advance.	1	2	3	4	5
4. Students should learn what they hoped to learn.	1	2	3	4	5
5. Students' communication skills should be developed.	1	2	3	4	5
6. Course contents should be up to date with national and international standards.	1	2	3	4	5
7. Students should be given guideline about the selection of courses.	1	2	3	4	5
8. The laboratories should have latest equipment and facilities.	1	2	3	4	5
9. Relevant to subject, lab fail it should be provided to the students.	1	2	3	4	5
10. Computer lab facility should be provided to the students.	1	2	3	4	5
11. Up to date computers should be in computer lab.	1	2	3	4	5
12. Comfortable furniture should be there in the classrooms.	1	2	3	4	5
13. Class notes and reading martial should be available online.	1	2	3	4	5
14. Class announcement should be done through email etc.	1	2	3	4	5
15. The proper channel should be established to receive feedback from students about teachers and other facilities.	1	2	3	4	5
16. Students' queries should be responded quickly.	1	2	3	4	5
17. Results should be readily available on the web.	1	2	3	4	5
18. Results should be declared within the stipulated time.	1	2	3	4	5
19. Knowledge should be up to date.	1	2	3	4	5

20. Proper SOP's are followed for teaching, examination and admission.	1	2	3	4	5
21. All administrative matters should be followed according to the university regulations.	1	2	3	4	5
22. Quality of teaching should be evaluated fairly.	1	2	3	4	5
23. The faculty attitude should be comparative and supportive.	1	2	3	4	5
24. Academic culture should be promoted.	1	2	3	4	5
25. Alumni follow up services should be provided.	1	2	3	4	5
26. There should be a liaison between students and university authorities.	1	2	3	4	5
27. The university management should be willing to listen the opinion of students.	1	2	3	4	5
28. The proper channel should be established to receive feedback from students about teachers and other facilities.	1	2	3	4	5
29. Celebrations of different events should be conducted.	1	2	3	4	5

How satisfied are you with this item in your university's service quality?

1: Not satisfied at all

2: Slightly not satisfied

3: Somewhat satisfied

4: Fairly satisfied

5: Very satisfied

ITEM	**1**	**2**	**3**	**4**	**5**
During the teaching process students should be involved.	1	2	3	4	5
Relevant case studies should be discussed.	1	2	3	4	5
Learning level should be determined in advance.	1	2	3	4	5
Students should learn what they hoped to learn.	1	2	3	4	5
Students' communication skills should be developed.	1	2	3	4	5
Course contents should be up to date with national and international standards.	1	2	3	4	5
Students should be given guideline about the selection of courses.	1	2	3	4	5
The laboratories should have latest equipment and facilities.	1	2	3	4	5
Relevant to subject, lab fail it should be provided to the students.	1	2	3	4	5
Computer lab facility should be provided to the students.	1	2	3	4	5
Up to date computers should be in computer lab.	1	2	3	4	5

Comfortable furniture should be there in the classrooms.	1	2	3	4	5
Class notes and reading martial should be available online.	1	2	3	4	5
Class announcement should be done through email etc.	1	2	3	4	5
The proper channel should be established to receive feedback from students about teachers and other facilities.	1	2	3	4	5
Students' queries should be responded quickly.	1	2	3	4	5
Results should be readily available on the web.	1	2	3	4	5
Results should be declared within the stipulated time.	1	2	3	4	5
Knowledge should be up to date.	1	2	3	4	5
Proper SOP's are followed for teaching, examination and admission.	1	2	3	4	5
All administrative matters should be followed according to the university regulations.	1	2	3	4	5
Quality of teaching should be evaluated fairly.	1	2	3	4	5
The faculty attitude should be comparative and supportive.	1	2	3	4	5
Academic culture should be promoted.	1	2	3	4	5
Alumni follow up services should be provided.	1	2	3	4	5
There should be a liaison between students and university authorities.	1	2	3	4	5
The university management should be willing to listen the opinion of students.	1	2	3	4	5
The proper channel should be established to receive feedback from students about teachers and other facilities.	1	2	3	4	5
Celebrations of different events should be conducted.	1	2	3	4	5

APPENDIX C

Results

Statistics

		Student	Gender
N	Valid	400	400
	Missing	0	0
Mean		1.0000	1.4775
Median		1.0000	1.0000
Std. Deviation		.00000	.50012
Minimum		1.00	1.00

Maximum	1.00	2.00

Student

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	400	100.0	100.0	100.0

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Males	209	52.3	52.3	52.3
	Females	191	47.8	47.8	100.0
	Total	400	100.0	100.0	

Reliability Statistics

Cronbach's Alpha	N of Items
.743	29

Reliability Statistics

Cronbach's Alpha	N of Items
.920	7

Reliability Statistics

Cronbach's Alpha	N of Items
.867	5

Reliability Statistics

Cronbach's Alpha	N of Items
.788	6

Reliability Statistics

Cronbach's Alpha	N of Items
.706	4

Reliability Statistics

Cronbach's Alpha	N of Items

.817	7

Descriptive Statistics

	Mean	Std. Deviation	N
R	28.3075	4.66448	400
T	20.3675	3.27249	400
RS	23.6525	3.54587	400
A	16.0775	2.15362	400
E	29.4050	3.18926	400

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Satisfaction	400	70.00	98.00	85.2375	6.04711
Valid N (listwise)	400				

The Effects of Transformational and Transactional Leadership Styles on Employee Innovation Performance

Liu ZIJING [a*], Khunanan SUKPASCHAROEN [b]

[a] *Chakrabongse Bhuvanarth International Institute for Interdisciplinary Studies, Rajamangala University of Technology Tawan-ok. E-mail:1786766250@qq.com*

[b] *Chakrabongse Bhuvanarth International Institute for Interdisciplinary Studies, Rajamangala University of Technology Tawan-ok. E-mail: khunanan_su@rmutto.ac.th*

Abstract

This document explores the impact of leadership styles on employee innovation performance by using transformational and transactional leadership styles as antecedent variables and introducing knowledge management as a mediating variable. The analysis of 615 matched pairs of direct leaders and subordinates revealed that both transformational and transactional leadership styles had a positive effect on employee innovation performance, with knowledge management playing a partially mediating role; among the four types of knowledge management activities, knowledge creation mediated the most between the two leadership styles and employee innovation performance than knowledge storage, transfer and application.

Keywords: transformational leadership, transactional leadership, leadership style, employee innovation performance, knowledge management

1. INTRODUCTION

1.1 Background of the study

Since the beginning of 2020, the global outbreak of novel coronavirus pneumonia and its rapid spread have had a major impact on the world economic order and international economic relations, and the globalization process has shown a trend of fragmentation. The dramatic spread of novel coronavirus pneumonia has had a serious impact on world economic growth, deep structures, and global economic governance, among other areas, no country will be able to survive this crisis alone. The impact of the epidemic has gradually weakened the pull of traditional engines, slowed down economic development and made the economic situation more uncertain. The ability to seize innovation opportunities and promote industrial upgrading and organizational change tests the wisdom and courage of the country and determines the future of enterprises. Autonomous innovation plays a key role in the development of a country's comprehensive national power. To improve the capability of independent innovation, it is necessary to stimulate the vitality of innovation subjects, balance the industry and geographical differences, and fill the innovation talent gap.

After Schumpeter first introduced the concept of innovation, business leaders gradually realized the importance of innovation. 21.9% of the 506 CEOs surveyed by Isaksen and Lauer considered technological innovation as the biggest market challenge for organizations in the 21st century, and 21.9% considered innovation capacity enhancement as the biggest internal management challenge for organizations in the 21st century [1]. Regarding the realistic demand for

* Corresponding author.

innovation in Chinese enterprises, the 2009 "Report on the Growth and Development of Chinese Business Operators" (hereinafter referred to as "the Report") shows that China's social reform and economic system transition is in a critical period, and technological change is still rapid. Entrepreneurial innovation is particularly important. 84.8% of business operators agree that they should be "ahead of the competition in developing new products", 84.2% agree that "the decision-making level emphasizes technological leadership", 69.6% agree that "corporate strategies focus on exploration and originality", etc. 69.6% agreed that "corporate strategy should focus on exploration and originality". It is clear that as the external environment becomes more and more complex, companies are demanding more and more innovation, and they must have stronger innovation ability in the future competition.

Xiamen is located across the sea from Taiwan and is an important central city on the west coast of the Taiwan Strait. In 1980, the State Council approved the establishment of Xiamen Special Economic Zone, and Xiamen became one of the special economic zones in China. Over the past 42 years since the establishment of the Special Economic Zone, the city's long-term average economic growth rate has ranked among the top large and medium-sized cities in China.

At the 19th National People's Congress, Xi Jinping, general secretary of the Communist Party of China (CPC) Central Committee, repeatedly stressed the need to promote high-quality economic development. The Central Economic Work Conference proposed to adhere to the policy of consolidation, enhancement, upgrading, and unrestricted access, with innovation-driven and reform and opening-up as the two wheels [2], to comprehensively improve the overall competitiveness of the economy and accelerate the development of a modernized economy. "During the 13th Five-Year Plan period, Xiamen has vigorously implemented the innovation-driven development strategy, promoted the construction of an innovative city, encouraged scientific and technological innovation, supported enterprise research, cultivated an innovative atmosphere, improved the innovation index, achieved effective innovation capacity building, and created a good innovation environment for the development of high-tech enterprises.

Therefore, as an intrinsic driving force affecting employees' innovation performance, it is important to explore the influence of leadership style on employees' innovation performance, to deeply stimulate enterprises' innovation ability and upgrade engine power, so as to drive industrial transformation and upgrading, to promote quality change, efficiency change and power change, to inject a constant stream of new momentum for better and faster development of Xiamen economy, and to become a powerful engine for Xiamen economy and even the national economy to achieve high-quality development. It has a very important significance.

1.2 Significance of the study

This study analyzes the mechanism of the role of leadership style in employee innovation performance from a localized perspective, taking into account the unique cultural background and situational factors in China. Linking leadership style and employee innovation performance provides a new research idea with theoretical significance for corporate innovation. Combining knowledge management factors provides a new research perspective. From the theoretical perspective, this paper has three contributions:

- It expands the study of the role mechanism of leadership style and enriches the study of knowledge management as a mediating variable in the study of the role mechanism between leadership style and employee innovation performance.

- Based on the human capital theory system, this paper explores the role of different leadership styles of leaders of high-tech enterprises in Xiamen City on knowledge management in enterprises and its influence, which enriches the knowledge management-related theoretical and empirical studies.

- This paper explores the mechanism of the relationship between the four processes of knowledge management and employee innovation performance in enterprises based on knowledge management theory.

The practical significance of this study is mainly reflected in providing directions and strategies for enterprises to enhance employees' innovative performance. The study illustrates that in the context of socialist culture with Chinese characteristics, innovation plays a very important role in the process of pursuing sustainable development and maintaining superior competitiveness, and examines the motivational effects of transformational and transactional leadership styles on the improvement of employees' innovation performance and the mediating role of knowledge management in the process of the two leadership styles' effects on the improvement of employees' innovation performance. It also explains the need for enterprises to focus on shaping a good innovation culture from the perspective of China's innovation environment. It also explains the need for enterprises to focus on shaping a good

innovation culture from the perspective of China's innovation environment. This provides a reference for Chinese business operators, especially business managers, to better manage their enterprises and achieve their innovation performance. This paper has three main contributions for high-tech enterprises:

- It helps leaders to choose the appropriate leadership style in the process of managing the company to enhance the innovation performance of the enterprise.

- It helps leaders to recognize the role of the level of knowledge management in the enterprise organization to enhance the innovation performance.

- It helps leaders to allocate the time of the four major processes of knowledge management reasonably when conducting enterprise management.

1.3 Problem statement

This study mainly focuses on the following contents:

- The impact of high-tech enterprises' leadership style on innovation performance. The purpose of this paper is to clarify the impact of transformational leadership style and transactional leadership style on innovation performance of high-tech enterprise leaders, and to make a comparative analysis of the effects of the two leadership styles.

- The influence of high-tech enterprise leadership style on the four processes of knowledge management. This paper explores the influence of transformational and transactional leadership styles on knowledge creation, storage, transfer and application in high-tech enterprises.

- The mediating effect of knowledge management on the relationship between leadership style and innovation performance of high-tech enterprises. Based on the viewpoint of knowledge-based theory, knowledge is the basic resource for enterprise innovation and sustainable development (Nonaka and Takeuchi, 1995), this paper takes knowledge management as an intermediary variable to explore the mediating role between leadership style and employee innovation performance in high-tech enterprises.

1.4 Research Objectives

The research objectives of this study are threefold:

- This paper explores the relationship between transformational and transactional leadership styles and employee innovation performance in the context of Chinese culture, and focuses on the mediating role of knowledge management in the relationship between the two leadership styles and employee innovation performance.

- By reviewing the literature on transformational leadership style, transactional leadership style, employee innovation performance, and knowledge management, describing the current state of research and relevant theories at home and abroad, and taking leaders and employees of high-tech enterprises in Xiamen, Fujian Province, China (one of the special economic zones established since China's reform and opening up) as the research subjects, to study the mechanisms of the effect of transformational and transactional leadership styles of Chinese enterprise managers on the innovation performance of their subordinate employees.

- To explore the use of transformational and transactional leadership styles by managers in high-tech companies in China to improve employee innovation performance, and to make recommendations for innovation efforts in Chinese companies based on the findings.

1.5 Limitations of this study

This study mainly selects knowledge management as a mediating variable to investigate the mechanism of the effect of different leadership styles on employee innovation performance. However, there are other paths for the influence of leadership styles on employees' innovation performance, which can be further explored in the future from the perspectives of organizational climate and environmental dynamics. Knowledge management is only one of the

factors influencing innovation performance of enterprises, and the factors influencing innovation performance such as knowledge management, organizational climate, and environmental dynamics show a mixed characteristic in their roles, that is, there may be interactions between different mediating variables, so future research can focus on whether other perspectives as mediating variables also influence innovation performance of Chinese high-tech enterprises, and also can further investigate the interaction effects of different mediating variables.

In terms of the application of the research method, although the enterprises selected in the case study meet the requirements of the case study method, due to the constraints, the research area is limited to Xiamen Special Economic Zone, and future research can include the relevant enterprises in Shenzhen, Zhuhai, Shantou, Xiamen and other special economic zones. In terms of research level, the questionnaire survey method in this study is a cross-sectional analysis of data, and future research needs to further follow up the research subjects and collect longitudinal data of enterprises through follow-up surveys to further verify the applicability of the conclusions of this paper. In future research, the sample size and industry scope can be expanded to further improve the generalizability of the findings.

2. LITERATURE REVIEW

2.1 Leadership style theory flow

Western leadership theories, starting from the 1930s, have mainly gone through leadership trait theory, leadership behavior theory, leadership power change theory, transformational leadership theory, and four-factor leadership theory. Trait theory pioneered the study of leadership theory by emphasizing the innate nature of leader qualities and arguing that effective leaders should possess some clear and easily identifiable traits or characteristics [9]. Since the late 1940s, scholars have shifted the focus of their research to leadership style, emphasizing the leader's behavior toward subordinates and explaining how leaders manage the relationship between task and relationship behaviors with subordinates to influence them, resulting in a series of theories of leadership style, mainly including behavioral theory, power change theory, transformational leadership theory, and four-factor leadership theory [10].

Leadership behavior theory was developed in the late 1940s to compensate for the deficiencies of leadership trait theory, which argued that leaders are not born but are formed through acquired training and development [11]. The leadership behavior theory lasted for about 30 years, and while abandoning the earlier leadership trait theory, it also had shortcomings, one being the inconsistency between the leadership behavior model and subordinate satisfaction and leadership effectiveness, and the other being the fragmentation of the dynamic process of leadership [11], therefore, the academic community called for more various factors of variation in the development of leadership theory, and the theory of variational leadership came into being.

Leadership variation theory, developed in the 1960s, assumes that the effectiveness of leadership is determined by a combination of the leader himself, the led, and the environment. Leadership variation theory is considered as a "leadership matching" theory, which is dedicated to matching leadership styles to the appropriate situation or environment [10].

As the literature and debate on leadership variation theory continued to grow, scholars began to question whether research on leadership style theory was useful or not, and the development of leadership style theory was severely constrained [12].During the 1970s and 1980s, various opposing voices on the development of leadership style theory were extremely strong, but two theories were supported by most scholars, namely, House's charismatic leadership [13] and the transformational leadership of Burns [14] and Bass [15], where transformational leadership became the mainstream of research as a new calling. In academic circles, the 1980s are generally considered by scholars as a watershed in the study of leadership theory: it was called "traditional leadership theory" before and after that it was called "new leadership theory". The so-called "new leadership theory" started with transformational leadership theory, and was followed by the four-factor leadership theory.

The theory of transformational leadership originated from Burns' Leadership. Bass published the book "Leading Beyond Expectations" [15] based on the House Charismatnor

ic Leadership, which first systematically put forward the theory of transformational leadership and laid the theoretical foundation for the new leadership school. Once the theory was proposed, it received widespread attention from academics and achieved a large number of considerable research results.

Leadership style theories have undergone a process from static to dynamic, from one-way to two-way, from local to systematic, but the theories of previous generations need to be put more into practice and need more practice, testing and evaluation [11]. In the information age, the sharing of knowledge and information, organizational change and conceptual change imply the transformation of the role of the leader in the traditional industrial age, the de-authorization becomes a challenge to the traditional leadership style in the information age, the flat organizational structure makes the basis and connotation of the leader's authority need to be changed, organizational change and

social change both demand the creativity of the leader, and the information age requires the leader to integrate the work The information age requires leaders to closely integrate work process and self-actualization, and the transformational leadership style is the leadership model to meet this requirement, that is, the information age calls for a transformational leadership style [17].

Based on the development of leadership style theory and the need for leadership styles in the information age, this paper will focus on transformational leadership styles and explore the relationship between transformational leadership and employee innovation performance.

2.2 Transformational Leadership Theory

Downton's book Rebel Leadership [18] became the prototype for the birth and research of transformational leadership theory. Based on Downton's research, Burns and Bass developed and systematically proposed the theory of transformational leadership. their higher-level needs, allowing them to develop holistically. Leaders develop a mutually encouraging and uplifting employee relationship that facilitates the conversion of employees into leaders" [14]. Building on Burns' conceptualization, Bass and colleagues, inspired by the concept of charismatic leadership, noted after field research that transformational leadership primarily makes subordinates aware of the importance of assuming obligations, stimulates their higher-level needs, builds mutual trust and creates benefits for the group that exceed their own value [19]. There are many researches on the definition of transformational leadership in academia. Some researchers argue that transformational leadership is the creation of a professional atmosphere between leaders and subordinates to create a respectful and friendly environment for learning and growth through value enhancement [20], while others argue that transformational leadership is the leader having charismatic qualities and motivating subordinates through this influence so that subordinates are willing to do their best to achieve organizational goals that exceed their personal goals or values [21], etc. Although scholars have different definitions of transformational leadership, the research on transformational leadership should focus on the substance of transformational leadership and allow different understandings of basic concepts and categories [22], and Bass' classic definition is widely accepted by academics. This study agrees and accepts Bass 'definition of transformational leadership. In fact, no matter how the definition of transformational leadership is developed and defined, it all reflects the following three characteristics:

- Beyond the incentives of exchange, through encouraging employees to go beyond their own interests, to achieve the expected performance;
- Pay attention to long-term goals, look at problems from the perspective of development, encourage employees to innovate;
- Guide employees to take on more tasks for their own development [22].

Transformational leadership theory divides leadership styles into transactional and transformational leadership styles, where the transactional leadership style emphasizes the exchange of certain values between the leader and subordinates, while transformational leadership goes beyond transactional leadership in that transformational leadership emphasizes not only the exchange of certain values, but also the use of motivation and moral connection by the leader to subordinates, and that true transformational leadership requires the leader to empower rather than require subordinates to comply. Rather than requiring subordinate compliance, Bass views transformational leadership and transactional leadership styles as complementary structures rather than two-tiered structures, where transformational leadership may coexist with transactional leadership and even, at certain times, a transformational leadership style that lacks a transactional leadership style can fail [15]. However, with the increasing development of information technology, the increasing emergence of team empowerment, flat organizations, and the prevalence of self-leadership theory, the two-factor division between transformational and transactional leadership styles in transformational leadership theory began to become difficult to explain the dynamic team-based organizational environment [16].

2.3 Knowledge Management

Scholars have conducted the following studies related to knowledge management and manufacturing enterprise performance: some scholars consider knowledge selection, capture, innovation and organization as constituting the knowledge activity process, while others consider knowledge acquisition, organization, dissemination, integration and application as important elements of knowledge management [23].Matyam and Leidner reviewed and explained the

literature on knowledge management in different fields, dividing it into knowledge creation, storage, transfer, and application [39].

Studies have proved that knowledge acquisition does not have a significant impact on innovation performance [24], and it has also been concluded that both explicit and tacit technical knowledge acquisition have a significant positive impact on firms' innovation capability [25]. Therefore, the existing contradictory findings need to be tested to provide a more reliable decision basis for knowledge management in manufacturing enterprises.

The ultimate purpose of knowledge management is to improve the enterprise economic benefit, and international importance to the environment, but from the perspective of a single research still focus on the current knowledge management influence on innovation performance, the research on the effects of ecological and economic performance is not much [26], this not only affect the cognition of knowledge management and enterprise value, also affect the enterprise performance comprehensive improvement. Current research mostly focuses on the impact of a single aspect of knowledge management on the performance of manufacturing enterprises, such as the relationship between knowledge transfer and innovation performance [27], and these single aspect studies prove that different knowledge management activities have an important role in innovation, but knowledge management as an organic whole requires comprehensive consideration of different aspects, yet not many studies have been conducted to include them in a unified framework. The analysis of the impact of KM on innovation performance is usually carried out from a single perspective, such as the marketing perspective in which knowledge acquisition affects innovation performance by influencing marketing development and exploration [28]. In fact, knowledge management affects the comprehensive performance of enterprises through influencing the decision-making methods, operational processes and results, which is a systematic process, but there are not many systematic studies that affect the application and expansion of knowledge management.

2.4 Innovation Performance

Employee innovation performance is considered to be a direct reflection of employee creativity, collective innovation performance and organizational innovation performance basis [29]. Janssen defined Innovative Job Performance as: In order to improve role performance, group performance or organizational performance, employees create, introduce and implement new ideas with purpose within their work roles, groups or organizations, including idea generation, idea promotion and idea realization[30]. At the level of performance generation, employee innovative performance is the objective result of novel and useful ideas achieved by their concrete implementation at the individual, group, and organizational levels [31]. The most widely used measure of innovative performance is Janssen and Van Yperen's scale, with three indicators (idea generation, idea support and idea implementation) with nine entries, to measure the extent to which employees engage in innovative behavior [32].

Employee innovation performance is influenced by many factors, and Service and Boockholdt showed through 30 empirical studies on innovation from 1983 to 1996 that management, structure, human resources, innovation practitioners, organizational culture and climate, external characteristics, innovation characteristics, and markets all play a significant role in innovation [33].

Among them, the impact of leadership styles on innovation has received great attention, and on the relationship between leadership styles and innovation performance, Özaralli's study showed that transformational leaders have a significant impact on team innovation, communication and performance [34]; Jong and Hartong identified 13 leadership styles and that leaders inspire employees to innovate through deliberate actions [35]; García-Morales et al. showed that transformational leaders influence organizational performance through the mediating role of organizational innovation; in our country, Yang et al. (2009) showed that transformational leaders influence technological innovation performance through the mediating role of interpersonal trust and organizational commitment and innovation culture [36].

2.5 Research hypothesis

Transformational leadership is good at creating the atmosphere of innovation, encourage employees to innovation, promote the ascension of employee creativity and organizational innovation level of progress [37], in which psychological empowerment and psychological capital play a partially mediating role. Therefore, this paper proposes the following hypothesis:

H1: Transformational leadership style is positively associated with employee innovation performance.

Transactional leaders guide and motivate employees to accomplish organizational goals by clarifying their needs in terms of job tasks, role perceptions, compensation, work outcomes, and career advancement. There is a great controversy in the academic community as to whether transactional leadership style can enhance employees'

innovative performance. Some scholars believe that a high degree of organizational authorization and transactional leadership will inhibit employees' innovation performance [38], while others believe that innovation performance will be improved if employees are given greater autonomy and a high authorization atmosphere is formed in the team [37].This paper argues that transactional leadership attention to complete the organizational goals, to be able to actively looking for and correct for a standard deviation, contingency management more easily, and focus on exception management, which helps employees to sustain innovation. Therefore, this paper proposes the following hypothesis :

H2: Transactional leadership style is positively associated with employee innovation performance.

Knowledge management is not a single activity, but an interrelated set of activities. Leadership styles can encourage or inhibit employees' motivation and initiative to absorb, extract, and share knowledge. Organizations that want to implement knowledge management must have an organizational culture and leadership style to match it. A strong knowledge repository is the basis for organizational change, improvement, and evolution. Both transformational leaders, who are good at stimulating employees' creativity, and transactional leaders, who focus on organizational performance, value the positive role of knowledge management in performance improvement. Therefore, this paper proposes the following hypothesis:

H3: Transformational and transactional leadership style on the four processes of knowledge management has significant positive influence.

Knowledge is the source of forming innovative capabilities, and innovation is the result of continuous testing and application of knowledge in the organization [44]. Innovative companies are better able to adapt to the changing environment and have stronger competitiveness. Innovation is also naturally bred when members of an organization continuously dig, search, and retrieve existing knowledge, store, disseminate, apply, argue, and test this knowledge within the organization, and obtain new findings that are recognized and understood by the members. Innovation is formed in the process of deep interaction between individuals and the environment in the organization. Knowledge sharing enables the knowledge created by individuals to circulate smoothly among members, and through a series of knowledge management processes such as storage and application, a more perfect organizational knowledge system is formed. Therefore, this paper puts forward the following hypothesis:

H4: All four processes of knowledge management have a significant contribution to employee innovation performance.

Transformational leadership style indirectly contributes to organizational innovation by influencing the four processes of knowledge management, therefore, the following hypothesis is proposed in this paper:

H5: Knowledge management can mediate the impact of transformational, transactional leadership styles on employee innovation performance.

2.6 Conceptual model

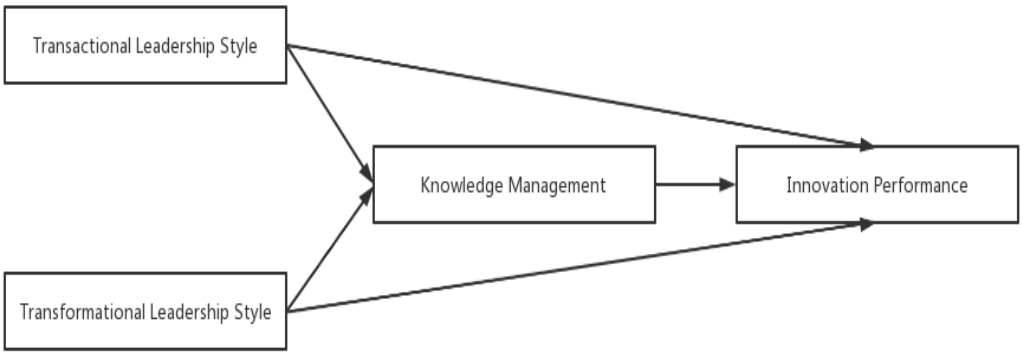


Fig. 1. Conceptual model

3. RESEARCH METHODOLOGY

3.1 Research Methodology

Qualitative research is the theoretical discernment of phenomena, and its main function is to "explain", including observation, interview, and panel discussion; quantitative research is mainly "empirical", i.e., to describe, speculate, and predict "what" and "why". The main function of quantitative research is "empirical", that is, to describe, speculate and predict "what" and "why", and the main methods used are: statistics, measurement and evaluation methods. In this study, quantitative research was chosen as the main research method.

3.2 Target population and sample

This study adopts a random sampling method, and the research subjects are mainly employees with innovative characteristics in high-tech enterprises in Xiamen, such as R&D personnel and marketing personnel. The following two criteria were used to select the sample: firstly, the research organisation had innovative activities, and the respondents had innovative behaviours at work; secondly, to ensure that the research organisation had sufficient time to carry out knowledge management activities, the research organisation could not be a newly established organization. Quota sampling will be used in this study. Quota sampling is a technique for selecting non-probability samples. This indicates that components of the population are selected non-randomly and not every member of the population has the same probability of being selected as a member of the sample group. A total of 700 questionnaires were distributed in this study. The final number of valid questionnaires returned was 615.

3.3 Questionnaire design

In the study, the questionnaire was divided into two parts, Questionnaire 1 was answered by employees, including basic information, organizational knowledge management, and leadership style of employees' immediate supervisors, and Questionnaire 2 measured employees' innovation performance level, which was answered by employees' immediate supervisors according to their innovation performance. The questionnaire uses a 5-point Likert scale, with 1 representing "very unlikely to meet" and 5 representing "very likely to meet".

3.4 Variable measurement

The Multivariate Leadership Questionnaire developed by Avolio et al. 1999 was used to measure leadership style, with 20 items for transformational leadership style and 8 items for transactional leadership style [41]. The scales developed by Nonaka, Guo, Jingjing, Han, and Gold were used to measure knowledge creation, knowledge storage, knowledge transfer, and knowledge application, respectively [42]. A scale developed by Janssen and Yperen was used to measure employee innovation performance, which was divided into three processes: idea generation, diffusion, and realization [43]. The four control variables included gender, education level, years of work unit establishment, and unit size. In terms of unit size, they were, in descending order, 100 or less, 101-200, 201-500, and 501-1000 employees,1001 or more.

3.5 Data Collection

The data were obtained in the following ways: firstly, through the power of friends and relatives; secondly, through field visits to high-tech enterprises to distribute questionnaires to R&D and marketing departments; thirdly, through online questionnaires and social networking platforms to ensure the timeliness of the survey as much as possible. For the quality of answering the questionnaire, it is controlled by the time of answering the questionnaire, if the single answer time is less than 2 minutes, it will be regarded as invalid questionnaire and its answer does not have research significance.

3.6 Data processing and analysis

The data analysis and processing work mainly includes the following: validation factor analysis, reliability analysis, validity analysis, correlation analysis, and model validation, etc.

Prior to the regression analysis of the data in this study, the data were tested for reliability and the Cronbach alpha reliability coefficient was selected to test the consistency of the data and to ensure that the reliability of the scales and the overall reliability of the questionnaire were error-free and stable.

This study focused on analyzing the construct validity of each item, constructing single-factor and multi-factor models, and using validated factor analysis methods. Preliminary examination of the correlation coefficients and significance among the variables provides the primary condition for subsequent exploration of the causal relationships among the variables.

4. DATA ANALYSIS AND RESULTS

4.1 Descriptive statistical analysis and reliability and validity analysis

The research process took into account the basic characteristics of the researched organisations and the researched subjects, and the data obtained are representative. The results of the correlation analysis showed that transformational leadership style was positively related to employee innovation performance, and transactional leadership style was positively related to employee innovation performance.

The Cronbach's alpha coefficients for transformational leadership style, transactional leadership style and employee innovation performance were 0.904, 0.883 and 0.779 respectively. The Cronbach's alpha coefficients for knowledge creation, knowledge storage, knowledge transfer and knowledge application were 0.788, 0.872, 0.902 and 0.777 respectively. The Cronbach's α values were all above 0.7 and the reliability was guaranteed.

The AVE values of 0.613(transformational leadership), 0.580(transactional leadership), 0.668 (knowledge creation), 0.604(knowledge storage), 0.683(knowledge transfer), 0.677(knowledge application) and 0.601(employee innovation performance) were all greater than 0.5, indicating good convergent validity of the above variables. In addition, the square root of AVE is greater than the absolute value of the correlation coefficients of the other dimensions, indicating that the measurement model has good discriminant validity.

Table 1 Results of descriptive statistical analysis

Variables	Classification	Frequency	Percentage (%)	Variables	Classification	Frequency	Percentage (%)
Gender	Male	337	54.8	Age	0-25years	61	9.9
	Female	278	45.2		26-35years	310	50.3
Education level	Under college	234	38.1		36-45years	98	16.0
	College	168	27.3		46-55years	126	20.5
	Bachelor's degree	131	21.3		55 years and above	20	3.3
	Master's degree	67	10.9	Number of years of establishment	0-2 years	23	3.7
	Doctorate	15	2.4		3-5 years	20	3.3
Position	Senior management	6	0.9		6-10 years	97	15.8
	Middle management	68	11.1		11-15 years	153	24.9
	Grassroots managers	158	25.8		More than 15 years	322	52.3
	General staff	383	62.2	Unit size	100 or less	139	22.6
Nature of unit	State administration	51	8.3		101-200	157	25.6
	State-owned enterprises	280	45.5		201-500	33	5.4
	Private enterprise	278	45.3		501-1000	202	32.8
	Foreign-funded enterprises	6	0.9		1001 or more	84	13.6

Table 2 Correlation analysis results

The research variables	1	2	3	4	5	6	7
1.Transformational leadership	(0.613)						
2.Transactional leadership	0.541**	(0.580)					
3.Knowledge creation	0.548**	0.484**	(0.668)				
4.Knowledge storage	0.497**	0.330**	0.654**	(0.604)			
5.Knowledge transfer	0.548**	0.390**	0.602**	0.568**	(0.683)		
6.Application of knowledge	0.554**	0.466**	0.607**	0.549**	0.587**	(0.677)	
7.Employee innovation performance	0.281**	0.309**	0.283**	0.265**	0.257**	0.214**	(0.601)
The average	4.197	3.756	3.817	3.990	3.971	3.982	3.595
The standard deviation	0.559	0.678	0.677	0.614	0.677	0.590	0.793

Note: The diagonal of the matrix is AVE value, * P < 0.05, * * P < 0.01.

4.2 Hypothesis testing

The impact of transformational and transactional leadership styles on employee innovation performance and knowledge management was first tested using regression equations controlling for employee gender, education, year of establishment and unit size, and then the impact of knowledge management on employee innovation performance was tested. As shown in Table 3, hypotheses 1, 2, 3 and 4 hold and transactional has a greater impact on employee innovation performance than transformational leadership style, but transformational leadership style has a greater impact on knowledge management than transactional leadership style. Year of unit establishment had a significant positive effect on knowledge creation ($\beta = 0.159$, $p < 0.05$), knowledge storage ($\beta = 0.116$, $p < 0.05$) and knowledge application ($\beta = 0.093$, $p < 0.05$); gender had a significant effect on employees' innovation performance ($\beta = - 0.398$, $p < 0.01$) and male employees' innovation The effect of gender on employees' innovation performance was significant ($\beta = - 0.398$, $p < 0.01$), with male employees having higher innovation performance than female employees. Employees' education and unit size do not have a significant effect on the knowledge management process, nor do they have a significant effect on the stimulation of employees' innovation performance[40].

The results of the test of mediating effects are shown in Table 4. Knowledge application did not mediate between transformational leadership style and employee innovation performance; the four processes of knowledge

management partially mediated between transactional leadership style and employee innovation performance, and hypothesis 5 partially held.

Table 3 Relationship between variables

	Knowledge creation	Knowledge store	Knowledge transfer	Knowledge application	Employee innovation performance
Transformational leadership style	0.518**	0.478**	0.540**	0.538**	0.264**
Transactional leadership style	0.464**	0.308**	0.394**	0.468**	0.276**
Knowledge creation					0.294**
Knowledge store					0.237**
Knowledge transfer					0.259**
Knowledge application					0.221**

Note: * * p < 0.01.

Table 4 Mediating effect test results

The independent variables		Employee innovation performance	The independent variables		Employee innovation performance
Transformational leadership style		0.264**	Transactional leadership		0.276**
Transformational leadership style*Knowledge creation	Transformational leadership style	0.157**	Transactional leadership*Knowledge creation	Transactional leadership	0.192**
	Knowledge creation	0.206**		Knowledge creation	0.180**
Transformational leadership style*Knowledge store	Transformational leadership style	0.190**	Transactional leadership*Knowledge store	Transactional leadership	0.220**
	Knowledge store	0.155**		Knowledge store	0.180**
Transformational leadership style*Knowledge transfer	Transformational leadership style	0.176**	Transactional leadership*Knowledge transfer	Transactional leadership	0.205**
	Knowledge transfer	0.163**		Knowledge transfer	0.179**

Transformational leadership style*Knowledge application	Transformational leadership style	0.201**	Transactional leadership*Knowledge application	Transactional leadership	0.217**
	Knowledge application	0.117**		Knowledge application	0.126**

Note: * P < 0.05, * * P < 0.01.

5. CONCLUSION

Based on a thorough regression of domestic and international literature, this paper focuses the research question on the influence of leadership style on innovation performance and the role of knowledge creation, knowledge storage, knowledge transfer and knowledge application in it, and proposes a theoretical hypothesis and constructs a theoretical model. Data were collected using a questionnaire method, the theoretical model was tested using relevant statistical methods, and the possible causes were analyzed. This section will analyze the implications of this study for companies based on the above research and provide an outlook on future research directions.

Based on the hypotheses proposed in the study and the results of the analysis after data collation, the main conclusions of this study are as follows:

- Transformational and transactional leadership styles have a significant positive effect on employee innovation performance.
- Knowledge management plays a partially mediating role in the influence process of both leadership styles on employees' innovation performance, with the influence mechanism of knowledge creation, storage and transfer being more prominent.
- The mediating role of knowledge creation in the process of knowledge management IV is more obvious.
- Knowledge application does not play a mediating role in the influence mechanism of transformational leadership style on employees' innovation performance.

Synthesizing the above discussion of the research results, the hypotheses proposed in this study were all verified to some extent. The following will analyze the implications of this study for companies in the context of the research findings. According to the empirical findings of this study, transformational and transactional leadership styles have a significant positive effect on employee innovation performance, and this effect is partially mediated by knowledge creation, storage, and transfer. It follows that a good leader needs to have both transformational and transactional leadership styles to complement each other when managing a company. In human resource management, the knowledge level of employees and knowledge management within the organization is improved through training, while performance appraisals are implemented. The behaviors that are detrimental to the achievement of innovation performance indicators are corrected in a timely manner as a way to improve employees' innovation performance. This study verifies the mediating role of knowledge management on transformational leadership style and employees' innovation performance, and proves that the mediating role of knowledge creation is the most obvious, while knowledge application does not play a mediating role, reflecting that knowledge creation is the premise and foundation of knowledge storage, transfer and application, regardless of the leadership style, in order to improve performance output，encourage employees to give full play to their imagination, support them to explore new problems, and provide diverse solutions. At work, transformational leaders emphasize change, value innovation, and encourage creativity, focusing on stimulating employees' creativity through the process of knowledge creation, storage, and transfer, and less on knowledge application. In addition, the results from the study also indicate that male employees have more outstanding innovation performance, which may stem from the traditional Chinese culture where men are more willing to innovate and accept challenges than women.

References

[1] Isaksen, S. G. & Lauer, K. J. The climate for creativity and change in teams [J]. Creativity and Innovation Management, 2002, 11(1): 74-86.
[2] Li Huajun. Economic growth, two-wheel drive and innovative nation building: theoretical evolution and Chinese practice [J]. Science and Technology Management, 2020(6): 70-90.
[3] Schulz T. Investment in human capital - the role of education and research [M]. Jiang B., Zhang H., Translation. Beijing: The Commercial Press, 1990.
[4] Becker G. Human capital [M]. Chen Gengxuan, Translation. Beijing: Machinery Industry Press, 2016.
[5] Jiang, J.W., Zhao, Shu-Ming. A new framework for research on the relationship between strategic human resource management and organizational performance: a theory integration perspective [J]. Journal of Management, 2007, 4(6): 779-814.
[6] CAMPBELLBA,COFFR,KRYSCYNSKID. Re-thinking sustained competitive advantage from human capital [J]. Academy of Management Reviews, 2012, 37(3):376-395.
[7] Dong, Xiangyu, Zhao, Shouguo, Wang, Zhongmin. From Demographic Dividend to Human Capital Dividend - Considerations Based on the New Economic Production Method [J]. Journal of Yunnan University of Finance and Economics, 2020 (2): 3-11.
[8] Li Xinjian, Li Yi, Wei Haibo. Exploration and Prospects of Organizational Human Capital Research [J]. Foreign Economics and Management, 2017, 39(1): 42-55.
[9] Bass, B. M. Stogdill's handbook of leadership: A survey of theory and research [M]. New York: Free Press, 1990.
[10] Hu Jianying, Jiang Qinfeng, Zhao Lanqi. A review of foreign leadership theory research[J]. China Human Resource Development, 2008, (11):93-96.
[11] Jiang Lingyan. The historical development and evolution of leadership theory[J]. Leadership Science, 2009, (9): 22-24.
[12] McCall, M. W. & Lombardo, M. W. Leadership: where else can we do? Durham, NC: Duke University Press, 1978.
[13] House, R. J. A theory of charismatic leadership [A]. Hunt, J. G. & Larson, L. L. Leadership: The cutting edge [C]. Cambridge,: Southern Illinois University Press, 1977:189-207.
[14] Bums, J. M. Leadership [M]. New York: Harper & Row, 1978.
[15] Bass, B. M. Leadership and performance beyond expectations [M]. New York: Free Press, 1985.
[16] Li Yan, Wei Feng. Evolution and frontier progress of leadership theory[J]. Journal of Management, 2010, 7(4): 517-524.
[17] Feng Jing. Calling for transformational leadership in the information age[J]. Leadership Science, 2009, (6): 24-25.
[18] Downtown, J. V., Jr. Rebel leadership [M]. New York: Free Press, 1974.
[19] Bass, B. M. Transformational leadership [J]. Journal of Management Inquiry, 1995, 4(3):293-298.
[20] Waddell, P. J., Swofford, D. L., Olsen, G. J. & Hillis, D. M. Phylogenetic inference [A]. In Molecular systematic (2nd ed.) [C], 1996: 407-514.
[21] Robbins, P. T. Greeting the corporation: Management strategy and environmental challenge [M]. Earthcsan, 2001: 198.
[22] Wang Fang. Research on Transformational Leadership Theory and Implications[J]. Leadership Science, 2009, (29): 29-31.
[23] Parikh M. Knowledge management framework for high tech research and development [J]. Engineering Management Journal, 2001, 13(3) : 27-34.
[24] Gu M-L, Bi X-H, Zhang J. Research on the relationship between knowledge integration, information refinement and corporate innovation performance[J]. Intelligence Science, 2017, (3) : 13-18.
[25] Xiong Jie, Sun Daoyin. Corporate social capital, technological knowledge acquisition and product
[26] A study on the relationship between innovation performance [J]. Management Review, 2017, (5) : 23 -38.
[27] Li Xiaomei. A study on the dimensions of corporate environmental performance evaluation from an eco-ethical perspective [J]. The Economist, 2014, (2) : 40-41.
[28] Zhang Hongbing. Mechanisms of knowledge transfer on innovation performance of alliance firms-mediated by strategic flexibility[J]. Scientific Research Management, 2015, (7) : 1-9.
[29] Wang Xianhui, Duan Jinyun, Tian Xiaoming, Kong Yu. Employee Creativity: Concepts, Formation Mechanisms, and Summary Perspectives[J]. Advances in Psychological Science, 2010, 18(5): 760-768.
[30] Sun Liping, Ling Wen Spokes. A review of corporate innovation content and innovation research methods [J]. Academic Communication, 2007, (2): 97-99.
[31] Amabile, T.M., Conti, R. Coon, H., et al, M. Assessing the work environment for creativity [J]. Academy of Management Journal, 1996. 39(5): 1154-1184.
[32] Janssen, O. & Van Yperen, N.W. Employees' goal orientations. the quality of leader-member exchange, and the outcomes of job performance and job Academy of Management Journal, 2004, 47(3): 368-384.
[33] Service, R. W. & Boockholdt, J. L. Factors leading to innovation: a study of managers' perspectives [J]. Creativity Research Journal, 1998, 11: 295-307.
[34] Service, R. W. & Boockholdt, J. L. Factors leading to innovation: a study of managers' perspectives [J]. Creativity Research Journal, 1998, 11: 295-307.
[35] Jong, Jeroen, P. J. & Hartong, Deanne, N. D. How leaders influence employees' innovative behaviour [J]. European Journal of Innovation Management, 2007, 10(1): 41-46.
[36] Yang Jianjun, Liu Blade, Ma Ting. An empirical study on the impact of transformational leadership style on technological innovation performance[J]. Research Management,2009, 30(2): 94-101.
[37] Wei F, Yuan X, Di Y. A cross-level study of transactional leadership, team empowerment climate and psychological empowerment affecting subordinates' innovation performance[J]. Management World,2009, (4).
[38] Anne Nederveen Pieterse. et al. Transformational and Transactional Leadership and Innovative Behavior: The Moderating Role of Psychological Empowerment, Journal of Organizational Behavior, Vol. 31, No. 4, 2009, pp. 609-623.
[39] Maryam Alavi,Dorothy E. Leidner,Zheng Wenquan. Knowledge management and knowledge management systems: conceptual foundations and research topics[J]. Management World,2012 (5).
[40] Miao Honghui. Transformational and transactional leadership styles Impact on employee innovation performance [J]. Social Science Front, 2019, (12): 240-244.

[41] Bruce J. Avolio, et al. "Re-examining the Components of Transformational and Transactional Leadership Using the Multifactor Leadership," Journal of Occupational & Organizational Psychology, Vol. 72, No. 4, 1999, pp. 441-462.

[42] Ikujiro Nonaka, et al. "From Information Processing to Knowledge Creation: A Paradigm Shift in Business Management," Technology in Society, Vol. 18, No. 2, 1996, pp. 203-218; Guo, Jingjing: "A Study on the Influence of Knowledge Storage Practices in Industrial Clusters on Firms' Innovation Performance - A Perspective of Knowledge Management," Science and Science and Technology Management, No. 6, 2013; Han Weihe and Ji Shaobo: "An Empirical Study on the Effectiveness of Knowledge Creation Processes at Individual and Team Levels," Journal of Tsinghua University (Natural Science Edition) 2006, No. S1; Andrew H. Gold, et al. Knowledge Management: An Organizational Capabilities Perspctive," Journal of Management Information Systems, Vol. 18, No. 1, 2001, pp. 185-214.

[43] Onne Janssen, Nico W. Van Yperen, "Employee Goal Orientations, the Quality of Leader-member Exchange, and the Outcomes of Job Performance and Job Satisfaction," Academy of Management Journal, Vol. 47, No. 3, 2004, pp. 368-384.

[44] Peter F. Drucker, Post-Capitalist Society, London. Butterworth-Heinemann, 2004.

Policing the Discourse: The Discursive Anatomy of a National Police Strategy Report

James MOIR [a*]

[a] *Abertay University, School Of Business, Law and Social Sciences, Dundee, Scotland, UK., j.moir@abertay.ac.uk*

Abstract

Police reporting has become subject to similar practices found in the corporate and commercial world. A key aspect of this is the strategic report which lays out the future of the organization in terms of the vision of senior executives. This paper considers the discursive construction of a police strategy report. Police reports in general belong to a wider reporting genres while strategic plans can be considered as part of a colony of planning genres. The discursive anatomy of this kind of report can be considered in terms of communicative purpose and the set of discursive moves involved that reflect normative expectations associated of the intended audience. These features are examined by way of a discursive analysis of a contemporary Police Scotland strategy report.

Keywords: Scotland, police, strategy, report, discourse

1. INTRODUCTION

Strategic management has become a commonplace beyond the world of corporate management and has colonized different domains of organizational life (Brandtner et al., 2017; Carter, 2013; Greckhamer, 2010; Greckhamer & Cilesiz, 2022; Kornberger & Clegg, 2011). As Carter et al., 2010: 573) point out the organizational world is "saturated by strategy" and indeed Carter (2013: 1047) characterizes it as "the master concept of contemporary times". This is also reflected in the production of strategy documents, and most pervades the discourse of public sector organizations where there has been a trend towards the adoption of managerialization. However, the rhetorical form of these documents and how they seek to justify strategic choices is a relatively under-researched area. This paper examines such a document: Police Scotland and the Scottish Police Authority's *Joint Strategy for Policing (2020): Policing for a safe, protected and resilient Scotland*. This document sets out the priorities and plans for the future direction of policing in Scotland in the coming years and represents a refresh of an earlier strategic plan from 2017. The discourse analysis undertaken on the document reveals how strategy is discursively constructed as necessary and also draws attention to the rhetorical features of the text that enable it to convey a sense of setting out an uncontestable course of action. The examination of the discursive anatomy of this document denaturalizes the normative way in which strategy is constructed within a the realm of public sector organizations.

1.1. Strategic Management Discourse in the Police Service

The field of strategic management developed as an academic field within business education (Bowman et al., 2002; Hambrick & Chen, 2008) and tends to focus on such aspects within the logic of a planning and the monitor of outputs (Alvesson & Willmott, 1995; Carter et al., 2010; Carter & Whittle, 2018; Ezzamel & Willmott, 2010; Grandy & Mills, 2004). The development of this type of approach led to an accompanying growth in corporate discourse framed around

* Corresponding author.

presenting projections and decisions expressed within strategy documents (Alvesson and Willmott, 1996; Balogun et al., 2014; Phillips & Dar, 2009). Much of this type of discourse is associated with a growing trend in the logic of managerialism (Alvesson and Deetz, 2000; Mueller and Carter, 2007) which has infused the public sector and orientated them towards the organizational practices found in the commercial and corporate world (Clarke & Newman, 1997; Jensen, 2020; Yeatman, 1993).

The turn towards managerialism within the police service has been commented upon by scholars who have examined the focus on targets and performance indicators. In a wide-ranging review of the nature and potential deleterious effects of managerialism in the Australian police service Vickers & Kouzmin (2001) drew attention to what they saw as several problems with this kind of approach, and most notably that its technocratic and rationalist focus could be counter-productive to public service people-facing work. Cockcroft & Beattie (2009) found widespread resistance by officer towards a concern with these type of indicators with the view that they are too narrow in focus on do not represent the breadth of the role. Martin (2003) provides a historical overview of U.K. policing and the ways in a focus on performance indicators as a measure of efficiency has led to various problems in the focus on statistics and targets meaning that government priorities dominate local concerns and agendas. Maguire & John (2006) in an assessment of intelligence-led policing which is based upon a strategic approach through the analysis and management of problems and risks, argue that it runs the risk of running up against police cultural attitudes and misunderstanding and of becoming dominated by of centrally set targets. More recently, Beckley (2021) has drawn attention to issues associated with a culture of managerialism with the Australian police service. She points to many of the issues addressed above including, the over-zealous focus on targets and performance indicators at the expense of focusing on a high-quality public service. On the other hand, she acknowledges that the latest model of public sector management is now entering the field of police strategic thinking based upon new public governance (Morgan & Cook 2015; Osborne, 2009; Sorrentino et al., 2018; Torfing & Triantafillou, 2013) . This model incorporates "public values" into decision making and strategic aims. It is based upon the recognition that public services rely upon inter-relationships and inter-dependencies, and that these services work across multiple boundaries with diverse stakeholders in terms of what constitutes "public value." Nonetheless, Beckley concludes that the police service must confront several historical issues to reach this stage of organizational development.

1.2. The Strategy Report in Policing

The widespread adoption of strategic management has meant that police forces now are require to produce longer range organizational plans. This has developed from the introducing strategic planning techniques in public sector organizations (Ferlie & Ongaro, 2015) based upon clear goals and strategies that define approaches to achieve these (Bryson, 2018). However, the effectiveness of strategic planning in police forces has been the subject of question and there has been a skepticism expressed about the use of strategic management approaches in the public sector, (Williams & Lewis, 2008; Boyne & Gould-Williams, 2003). One of the few studies of the ways in which strategic planning is implemented in the police service was conducted by Elliot et al. (2020) who found that strategic plans have an indirect role in appears to facilitating higher level middle managers in adopting a more effective strategic role as well as providing more clarity for the processual nature of interactions with external stakeholders.

Reports and plans can be considered in terms of belonging to genres of communicative purposes Bhatia (2004). Police reports belong to a wider reporting genres while strategic plans can be considered as part of a colony of planning genres. It is of course possible that there is a combination of both in a given document. Genres can be considered in terms of their communicative purposes and involve a set of discursive moves that reflect normative expectations associated of their intended audiences in terms of content and format (Bhatia, 2004; Swales, 1990). Investigations into the nature of strategic reports have focused on the discursive construction and rhetorical forms of the texts. For example Vaara et al. (2010) used a critical discourse analysis approach in examining how a strategic city plan in Finland achieves discursive power through features such as self-authorization where the text refers to its own importance as a strategy documents (e.g. "Strategy is a central tool for leading a city": Vaara et al. 2010: 690; technical discourse and terminology in terms of indicators and factors (e.g. SWOT-analysis); the use of key buzzwords (e.g. "service offerings" and "individual responsibility" Vaara et al. 2010:693; forced consensus where the decision options are presented in a limited way (e.g., "Services will not be provided according to production capacity, but will be based on real customer need." Vaara er al. 2010: 695; and the use of declaratives that turn into imperatives (e.g., "The city's finances will strengthen to the extent that the contribution margin will suffice to cover all net investments and even pay off the debt." Vaara et al., 2010: 696.

However, not all strategic plans are as authoritative in terms of the power they convey and this is particularly the case in public sector organizations who have multiple stakeholders such as the police service. In order to accommodate these stakeholders the discursive construction of a strategy report may rely upon a degree of ambiguity where multiple interpretations are possible and so permitting stakeholders to read into such a report their own interests. This is referred to by Benders & Van Veen as 'interpretative viability', and by Giroux (2006) as 'pragmatic ambiguity'. Both concepts refer the notion that stakeholders have leeway to interpret the text and have the potential to do so in a way that fits their own concerns and purposes. Drawing upon a conversation analytic perspective Pälli et al. (2009: 313) point out that these kind of strategy documents are part of a language game where "the choices made in the strategy text do have several possible meanings even to the strategists themselves". This has indeed been found in studies of strategic planning in public and non-profit sector organizations which indicate that discursive ambiguity is inherent in meeting the interests of various stakeholders. This is apparent for example, in hospital strategic plans that offer a degree of vagueness in terms of development recommendations (Denis et al., 1991) or in the plan of a government granting agency (Davenport & Leitch, 2005).

Taking the points made in reviewing the literature, the aim of this research is to examine the strategic plan of Scotland's Police Service (Police Scotland) with a view to identifying some of the key discursive issues identified above, including if the selected strategy document makes use of: (i) conventional strategizing in terms of use of figures, technical terms, buzzwords and the like; (ii) the use of new public governance discourse that is more inclusive in tone; (iii) the use of declaratives and modal verbs such as "will" and so on. The next section describes in more detail the methodological approach undertaken in the study.

2. METHODOLOGY

Police Scotland's strategy report *Scotland's Joint Strategy for Policing (2020): Policing for a safe, protected and resilient Scotland* forms the basis of the analysis presented in this paper. This report is a key consultative document that lays out Police Scotland's future direction for policing in terms of community relations:

"This Strategic Police Plan recognizes the unique role of policing in the communities we serve. It reflects the need to refocus and redirect resources to ensure that officers and staff are fully supported as they respond with commitment and professionalism to the needs of communities." (p. 5)

Moreover, this strategic report is a legal requirement under the terms of the Police and Fire Reform (Scotland) Act 2012 Sections 34 and 35 with ministerial approval prior to publication and was laid before the Scottish Parliament on 9 April 2020. It is jointly produced by the Scottish Police Authority and Police Scotland and at some forty pages in length can be considered as a high-level strategy document that sets out policing priorities and plans in line with the Scottish Government's revision of Strategic Police Priorities.

Police Scotland was established as on 1 April 2013 as the single body responsible for policing across Scotland. It is the second largest police force in the UK after the London Metropolitan Police. It is comprised of thirteen local divisions with each being responsible for meeting local needs and priorities, although the overall strategic direction is centrally governed. Apart from the 2020 *Joint Strategy for Policing* document, Police Scotland also provides an annual police plan which aligns with the aforementioned strategic document.

Following Cornut et al. (2012), the strategy document has been examined in terms of key features of the genre of strategic reporting, and specifically with regard to policing in the context of inclusion and diversity and how this features in terms of the discursive construction of the report and its reference to inter-relationships and any consequent scope for stakeholder interpretation. The structure of the report is examined, its reference to an outcomes focus, its tone in terms of optimism and commonality, and it grammatical construction in terms of the use of modal and deontic verbs and self-referential pronouns.

3. ANALYSIS

3.1. The Contents Page

The main aspect of discursive anatomy of importance is the structure, akin to a skeleton of the report. This in large measure corresponds with Allison & Kaye's (2011) guide to *Strategic Planning for Nonprofit Organizations* in which it is suggested that the following headers are used to structure such reports: Introduction by the President of the Board; Executive Summary; Mission and Values Statement; Organization Profile and History; Summary of Core Strategies; Programme Goals and Objectives; Financial, Administrative and Governance Goals and Objectives; Appendices. In comparing the Police Strategy report with Kaye's guide then it is possible to see how there is a high degree of

correspondence, particularly in terms of laying out key statements such as Mission and Values (Values, Purpose and Vision in the report), Summary of Core Objectives (Strategic Police Priorities in the report), and Programme Goals and Objectives (Outcomes 1 -5 in the report). The Organizational Profile, including key financial information is laid out in the report in graphical form with the following sub-headers: About Us, Wider Context, and Improvements Under Way. One of the first features that is apparent is the contents page and structuring of the report which sets up a mixture of outcomes discourse with terms that imply stakeholder inclusion and inter-relationships with communities. This mix indicated a twin focus on the traditional outcomes and measurement features of strategic plans with a more stakeholder and new public governance orientation.

Contents

Another feature that is apparent is the contents page and structuring of the report which sets up a mixture of outcomes discourse with terms that imply stakeholder inclusion and inter-relationships with communities. This mix indicated a twin focus on the traditional outcomes and measurement features of strategic plans with a more stakeholder and new public governance orientation. Note the discursive tone in these headers that convey efficiency and effectiveness: “a proactive and response police service”; “effective service delivery”; “confidence in policing”; “positive working environment”; “sustainable, adaptable and prepared for future challenges”; “delivering change”. This discourse convey a tone of forthright optimism in the police service and therefore sets the report up as positive and including ‘deliverables’.

3.2. Strategic Moves: Context and Priorities

One of the key rhetorical means through which the strategic reports seek to justify their priorities is to point to a changing context that necessitates these priorities. This provides the musculature of the report, the strategic moves that it makes and its driving impetus. The police report does so by making several points concerning the changing nature of society in order justify a need for change in the way that policing is conducted. The following statements from the report show how the is built into the rhetorical format of the discourse with points made about changing nature of society followed by what this means for policing priorities.

“Society is changing. We find ourselves moving at an ever-increasing pace from the physical to the digital world; a move that creates opportunities for new and complex crime types. This shift also affects traditional crime, much of which now has a digital element.

To protect people effectively, Police Scotland will evolve, sharpening its focus on keeping people safe from harm, whilst embracing innovative technologies and partnerships.” (p.14)

"The pace of technological change means that people increasingly feature or are active participants in a digital world. Policing will reflect this in how resources are allocated, ensuring the services provided are inclusive and proactive in meeting the needs of all communities." (p.18)

It is evident from the above the changing nature of society is framed in terms of digitization and the threat of cybercrime. Note the rhetorical use of descriptions to enhance this claim ("ever-increasing pace"; "pace of technological change" "affects traditional crime"). This change which constitutes a threat to law-abiding citizens is then used to justify the priority of "keeping people safe from harm" but also utilizing "innovative technologies and partnerships". The key point here is that these changes are presented as being at "pace" and therefore requiring the police service to literally keep pace with them.

However, there is also contained withing the report that the police service itself must stay at the forefront of modernization, that it must adapt to ever-changing technology. An example of this discourse can be found in the extract in which the new technology is presented as being beneficial to modern policing.

"Our frontline officers are being equipped with mobile devices, making them more autonomous and allowing them to spend more time in communities. We will continue to identify and improve functionality so that our people can be effective where they are needed most. As we change our fleet, our vehicles will become mobile working environments. As new technologies for policing become available, we will consider how they will support our frontline delivery for the public." (p.20)

What is interesting to note about this extract is the way in which the use of new technology is rhetorically presented as a means for police officers to spend more time in communities (presumably without having to return to desktop computers within an police office environment). The focus on inter-dependencies and interaction in communities is a key driver within the strategic aims of the document. This is set within the context of meeting the needs of diverse communities:

"Our understanding of the term 'community' has evolved over time and is no longer limited to communities of geography. People also identify as part of communities formed through other shared characteristics, beliefs and experiences. This includes online connections, with people feeling part of multiple community groups. We will continue to improve the services we provide as society evolves.

We will work collaboratively with the communities we serve, drawing on expertise and experience to inform our work. We will embed accessibility and inclusivity into our service design. Accessibility standards will be applied across our technology, processes and systems, both internally and externally.

Our workforce must be representative of all our communities. Following recruitment drives for under-represented groups, our workforce is increasingly diverse. We must, however, do more to attract the brightest and best candidates to policing as a positive and inclusive employer." (p. 21)

"Engaging with people strengthens relevance, responsiveness and accountability and builds trust. It helps us learn about people and create services that meet their needs. We will improve and refocus our engagement activities where these are not reaching diverse communities and are not representative of the society we serve." (p.25)

What is apparent from the above is the term 'community' is presented as reflecting modern conception of identity and that this is presented within the notion of 'inclusivity'. Clearly this echoes the model of strategic planning as part of a new public governance model. This is extended to the workforces as "being representative of all our communities" and recognizes the need for recruitment from under-represented groups. Note the tone withing which this is set given that there has been public criticism of police forces for their lack of diversity. This is put more positively as a 'to do' by noting that Police Scotland must "do more to attract the brightest and best candidates to policing as a positive and inclusive employer". This kind of discourse rhetorically sidesteps criticism and instead put the drive for inclusivity in affirmative terms. Likewise, rhetorical impetus is given to "engagement activities where these are not reaching diverse communities and are not representative of the society we serve." Again, although there is a recognition that the police service do not engage with certain communities, these are left unspecified and instead a more positive tone is stressed in terms of a general attempt to reach such communities.

3.3. Outcomes and Measurements

The report focuses on five outcomes which can be thought of as the major organs of its discursive anatomy. These are laid out in sections that state the nature of each followed by declarative statements of intent explanatory comments on each. Thus, the five outcomes and statements run as follows:

Outcome 1

Threats to public safety and wellbeing are resolved by a proactive and responsive police service

To achieve this outcome, Police Scotland will:
1. Keep people safe in the physical and digital world
2. Design services jointly to tackle complex public safety and wellbeing challenges
3. Support policing through proactive prevention

Outcome 2
The needs of local communities are addressed through effective service delivery

To achieve this outcome, Police Scotland will:
1. Understand our communities and deliver the right mix of services to meet their needs
2. Support our communities through a blend of local and national expertise
3. Support the changing nature of communities

Outcome 3
The public, communities and partners are engaged, involved and have confidence in policing

To achieve this outcome, Police Scotland will:
1. Embed the ethical and privacy considerations that are integral to policing and protection into every aspect of the service
2. Protect the public and promote wellbeing across Scotland by providing services that are relevant, accessible and effective
3. Work with local groups and public, third and private sector organisations to support our communities

Outcome 4
Our people are supported through a positive working environment, enabling them to serve the public

To achieve this outcome, Police Scotland will:
1. Prioritise wellbeing and keep our people safe, well equipped and protected
2. Support our people to be confident leaders, innovative, active contributors and influencers
3. Support our people to identify with and demonstrate Police Scotland values and have a strong sense of belonging

Outcome 5
Police Scotland is sustainable, adaptable and prepared for future challenges

To achieve this outcome, Police Scotland will:
1. Use innovative approaches to accelerate our capacity and capability for effective service delivery
2. Commit to making a positive impact through outstanding environmental sustainability
3. Support operational policing through the appropriate digital tools and delivery of best value

What is apparent in these declarative strategic statements is their familiarity as part of conventional managerialist planning and reporting. Each is numbered as a set if objectives and in so doing this serves to draw attention to their importance as major statements of intent. Furthermore, in the section of 'Measuring Progress and Assessing Performance' it is pointed out that "The five strategic outcomes provide a clear message to the public and stakeholders on how policing in Scotland is expected to improve as a consequence of implementing this Strategic Police Plan." (p.37). This section goes onto explain the measurement process, but given the high level nature of the document, does not specify this in detail but instead notes that

"The policing performance framework consists of a set of measures agreed between the Authority and Police Scotland, and an accompanying public reporting regime. For each of the agreed measures, a baseline position is established at the outset, and the direction of travel is agreed.

Progress against each of the framework's measures is reported by Police Scotland to the Authority's Policing Performance Committee for initial consideration, and to the Authority's Board meeting for full review on a quarterly basis."

"The Scottish Police Authority draws on a range of publicly available information and data to produce its Annual Review of Policing, including material contained in the quarterly performance reports provided by Police Scotland during the reporting year. In compiling this comprehensive view of Policing Performance, the Authority also reaches out to each Scottish local authority, Her Majesty's Inspectorate of Constabulary in Scotland and other partner organisations for their views on the impact of policing, in order to reflect a wide range of data and opinion sources." (p.37)

The rhetorical effect of this kind of statement is to provide confidence that there is indeed a means of measure how far outcomes have been achieved, and moreover that these rely upon tangible data drawn from a range of sources. What is left unspecified is the extent to which such data leads to adjustments or criticisms should outcomes not be considered as being achieved or on the way to being so.

3.4. The Grammar of Strategy

The document is discursively driven along through various strengths of modal and deontic verbs such as "will", "required", "requires" "encourage" and self-referential pronouns such as "we", "our", and "us". This can be thought of as the discursive nervous system of the document in that it relays messages through grammatical channels that act to energize the statements made. Examples of these types of grammatical features (underlined) are set out below.

"Police Scotland will continue its programme of transformation to ensure better efficiency and effectiveness within the financial allocation, whilst articulating clearly the level of resources required for current and future services." (p.7)

"Greater investment here will allow us to focus our resources on partnership, prevention and early intervention, enabling us to find effective solutions together. We will utilise our unique policing insights to demonstrate a clear case for change, building a solid evidence base for targeted investment in preventative measures to address vulnerability, mental ill-health and substance misuse." (p. 17)

"Local engagement is critical. To do this meaningfully and effectively requires genuine dialogue, respect, integrity, transparency and accountability." (p.19)

"We will improve how we manage public contact and the end-to-end user experience. This will create an accessible and seamless public experience with inclusive services. It will expand our digital and online options significantly. Our aim is to get it right first time, giving the public a better service and operating more efficiently as a modern police service." (p. 24)

"Our people have been subjected to a recent rise in violent assaults whilst performing their duties. We will learn from each of these instances and ensure staff have the right training and equipment to deal safely with all incidents they attend." (p.27)

We will continue to encourage our people to challenge the status quo, recognising when they suggest better, more efficient ways of doing things. We will encourage proactivity and problem-solving. (p.31)

"We will work in partnership with other public, third and private sector organisations to identify opportunities and threats, collectively seeking innovative solutions." (p. 31)

"If you have something to tell us about the Strategic Police Plan or our service, please contact us at: https://www.scotland.police.uk/contact-us (p.40).

What is evident from the grammatical features drawn attention to is how they provide inclusive and yet firm statements of intent and action. In particular, the use of the modal verb "will" provides a channel for making clear the action to be taken but when combined with the pronoun "we" rather than a third person versions such as "it will" or "this will", adds to the apparent strength of resolve and accountability behind the statements made. In addition, words such as "required" add strength to the claim being made in terms of what is needed.

4. CONCLUSION

The Police Scotland strategic plan analyzed within this study contributes to an understanding of how such public sector documents at times mimic the genre of strategy reports in the corporate and commercial world as well as deploying elements of the new public governance model that seeks to adopt a more inclusive and "for the public good" tone. I have chosen to depict the analysis as seeking to understand the discursive anatomy of the report as this seems an apt metaphor in getting into the 'body' of such writing. However, it should not be lost on the reader of such reports that they are more than just high-level statements of intent; that they are the they are living documents where the actions of the police force are assessed in relation to those statements. Although the rhetorical construction of the report does not set hard targets in terms of quantifiable outcomes with specified target dates, it does have an indirect impact on policing practice in terms of the strategic role adopted by higher middle level managers as the recent work

of Elliot et al. (2020) has found. The discursive construction of such reports therefore serves as a guide, however loosely, operational police matters. However, what is also striking about the police strategy report is that its audience id the wider 'public' in the sense that it is a public document that is open to scrutiny. Perhaps this fact, more than its role in guiding operational practices that is where its audience lies; not with police officers but with the wider public who are entitled to know how the police operate, their problems, shortcomings, successes, and plans for the future.

Acknowledgements

I would like to acknowledge the Scottish Institute for Policing Research (SIPR) whose grant award funded the work undertaken in this paper.

References

[1] Allison, M., & Kaye, J. (2011). Strategic planning for nonprofit organizations: A practical guide and workbook. John Wiley & Sons.
[2] Alvesson, M. and Deetz, S. (2000) Doing Critical Management Research. London: Sage.
[3] Alvesson, M. and Willmott, H. (1995) Strategic Management as Domination and Emancipation: From Planning and Process to Communication and Praxis. Advances in Strategic Management 12A: 85–112.
[4] Alvesson, M. and Willmott, H. (1996) Making Sense of Management: A Critical Introduction. London: Sage.
[5] Balogun, J., Jacobs, C., Jarzabkowski, P., et al. (2014) Placing Strategy Discourse in Context: Sociomateriality, Sensemaking, and Power. Journal of Management Studies 51(2014): 175–01.
[6] Beckley, A. (2021). Is Managerialism Alive and Well in the Police Service?. In Enhancing Police Service Delivery (pp. 341-358). Springer, Cham.
[7] Benders, J. and van Veen, K. (2001) What's in a fashion? Interpretative viability and management fashions. Organization 8(1): 33–53.
[8] Bhatia, V. K. (2004) Worlds of Written Discourse. London: Continuum.
[9] Brandtner, C., Höllerer, M., Meyer, R., et al. (2017) Enacting Governance Through Strategy: A Comparative Study of Governance Configurations in Sydney and Vienna. Urban Studies 54(5): 1075–91.
[10] Bowman, E., Singh, H. and Thomas, H. (2002) 'The Domain of Strategic Management: History and Evolution', in: A. Pettigrew, H. Thomas and R. Whittington (eds) Handbook of Strategy and Management, pp. 31–51. London: Sage.
[11] Boyne, G., & Gould-Williams, J. (2003). Planning and performance in public organizations an empirical analysis. Public Management Review, 5(1), 115-132.
[12] Carter, C. (2013) The Age of Strategy: Strategy, Organizations and Society. Business History 55(7): 1047–57.
[13] Carter, C., Clegg, S., and Kornberger, M. (2010) Re-Framing Strategy: Power, Politics, and Accounting. Accounting, Auditing & Accountability Journal 23(5): 573–94.
[14] Clarke, J. and Newman, J. (1997) The Managerial State: Power, Politics and Ideology in the Remaking of Social Welfare. London: Sage.
[15] Clegg, S., Courpasson, D. and Phillips, N. (2006) Power and Organizations. London: Sage.
[16] Cockcroft, T. and Beattie, I. (2009), "Shifting cultures: managerialism and the rise of "performance"", Policing: An International Journal, Vol. 32 No. 3, pp. 526-540.
[17] Cornut, F., Giroux, H. and Langley, A. (2012) The Strategic Plan As A Genre. Discourse & Communication 6(1): 21–4.
[18] Davenport, S. and Leitch, S. (2005) Circuits of power in practice: Strategic ambiguity as delegation of authority. Organization Studies 26(11): 1603–1623.
[19] Denis J-L, Langley A and Lozeau D (1991) Formal strategy in public hospitals. Long Range Planning 24(1): 71–82.
[20] Elliott, G., Day, M., & Lichtenstein, S. (2020). Strategic planning activity, middle manager divergent thinking, external stakeholder salience, and organizational performance: a study of English and Welsh police forces. Public Management Review, 22(11), 1581-1602.
[21] Ezzamel, M. and Willmott, H. (2004) Rethinking Strategy: Contemporary Perspectives and Debates. European Management Review 1(1): 43–8.
[22] Ezzamel, M. and Willmott, H. (2010) Strategy and Strategizing: A Poststructuralist Perspective. Advances in Strategic Management 27: 75–09.
[23] Ferlie, E., & Ongaro, E. (2015). Strategic management in public services organizations: Concepts, schools and contemporary issues. Routledge.
[24] Giroux H (2006) It was such a handy term: Management fashions and pragmatic ambiguity. Journal of Management Studies 43(6): 1227–1260.
[25] Grandy, G. and Mills, A. (2004) Strategy as Simulacra? A Radical and Reflexive Look at the Discipline and Practice of Strategy. Journal of Management Studies 41(7): 1153–170.
[26] Greckhamer, T. (2010) The Stretch of Strategic Management Discourse: A Critical Analysis. Organization Studies 31(7): 841–71.
[27] Greckhamer, T. and Cilesiz, S. (2022). The extension of strategic management discourse into public education administration: A critical analysis. Organization, 29(4), 619-652.
[28] Hambrick, D. and Chen, M.-J. (2008) New Academic Fields as Admittance-Seeking Social Movements: The Case of Strategic Management. Academy of Management Review 33(1): 32–4.
[29] Jensen, P. (2020) Alternative Logics: A Discursive Approach to Normative and Alternative Organizing. Human Relations. Published online before print February 6, doi: 10.1177/0018726720904128.

[30] Maguire, M., & John, T. (2006). Intelligence led policing, managerialism and community engagement: Competing priorities and the role of the National Intelligence Model in the UK. Policing & society, 16(1), 67-85.
[31] Martin, D. (2013). The politics of policing: managerialism, modernization and performance. In The new politics of crime and punishment (pp. 166-189). Willan.
[32] Morgan, D., & Cook, B. (2015). New public governance: A regime-centered perspective. Routledge.
[33] Morgan, D., & Cook, B. (2015). New public governance: A regime-centered perspective. Routledge.
[34] Kornberger, M. and Clegg, S. (2011) Strategy as Performative Practice: The Case of Sydney 2030. Strategic Organization 9(2): 136–62.
[35] Mueller, F. and Carter, C. (2007) 'We Are All Managers Now': Managerialism and Professional Engineering in UK Electricity Utilities. Accounting, Organizations, and Society 32(1–2): 181–95.
[36] Osborne, S. P. (2010). Introduction The (New) Public Governance: a suitable case for treatment?. In The new public governance? (pp. 17-32). Routledge.
[37] Pälli, P., Vaara, E. and Sorsa, V. (2009) Strategy as Text and Discursive Practice: A Genre-Based Approach to Strategizing in City Administration. Discourse & Communication 3: 303–18.
[38] Phillips, N. and Dar, S. (2009) 'Strategy', in: M. Alvesson, T. Bridgman and H. Willmott (eds), The Oxford Handbook of Critical Management Studies, pp. 414–432. Oxford, NY: Oxford University Press.
[39] Police Scotland & Scottish Police Authority (2020) Joint Strategy for Policing (2020): Policing for a safe, protected and resilient Scotland. https://www.scotland.police.uk/spa-media/crhngr0e/joint-strategy-for-policing-2020-21.pdf
[40] Sorrentino, M., Sicilia, M., & Howlett, M. (2018). Understanding co-production as a new public governance tool. Policy and Society, 37(3), 277-293.
[41] Swales, J.M. (1990) Genre Analysis – English in Academic and Research Settings. Cambridge: Cambridge University Press.
[42] Torfing, J., & Triantafillou, P. (2013). What's in a name? Grasping new public governance as a political-administrative system. International Review of Public Administration, 18(2), 9-25.
[43] Vaara, E. (2010) 'Taking the Linguistic Turn Seriously: Strategy as a Multifaceted and Interdiscursive Phenomenon', in: J. Baum and J. Lampel (eds) Advances in Strategic Management. The Globalization of Strategy Research, Vol. 27, pp. 29–50. Bingley, UK: Emerald.
[44] Vaara, E., Sorsa, V. and Pälli, P. (2010) On the Force Potential of Strategy Texts: A Critical Discourse Analysis of a Strategic Plan and Its Power Effects in a City Organization. Organization 17(6): 685–02.
[45] Vickers, M.H. and Kouzmin, A. (2001), "New managerialism and Australian police organizations: A cautionary research note", International Journal of Public Sector Management, Vol. 14 No. 1, pp. 7-26.
[46] Williams, W., & Lewis, D. (2008). Strategic management tools and public sector management: The challenge of context specificity. Public Management Review, 10(5), 653-671.
[47] Yeatman, A. (1993) Corporate Managerialism and the Shift from The Welfare to the Competition State. Discourse: Studies in the Cultural Politics of Education 13(2): 3–9.

Live Web Chat as a Website Communication Tool - the Case Study of Czech Spa Resorts´ Websites

Petr CIZEK[a*]

[a] *University of West Bohemia, Faculty of Economics, Department of Business Administration, Univerzitní 2732/8, 301 00 Pilsen, Czech Republic, cizekp@kpm.zcu.cz*

Abstract

The aim of the article is to provide analysis of websites of Czech spa resorts with focus whether they are using live web chat as communication tool to reach their customers. Live web chat is modern tool of synchronous exchange of information between customers and the companies. By implementing web chat technology, company can increase sales or the value of the average order. On the other hand, the implementation of web chat is associated with high investment and operational costs. Moreover, almost half of the customers never used live web chat before. The results show that from 127 analyzed websites of Czech spa resorts, only 11% are using live web chat widgets. Moreover, there is significant variance in the ready-made solutions used (with Daktela or Smartsupp as leading solutions). Those widgets are mostly (71%) placed on bottom-right of the website.

Keywords: spa resorts, web chat, website, communication, customers

1. INTRODUCTION

The communication between customers and companies are very important for a potential sale opportunity or for a customer support. Currently, most of the companies are using their websites to create single point to give information about their activities. For further communication with a customer, there could be used different communication tools such as phone contact, email contact or web form which can customer use to write their queries.

The article focuses on particular modern type of communication – live web chat and its usage and implementation on the websites. The aim of the contribution is to analyze websites of Czech spa resorts and identify which of them have implemented live web chats on their websites.

2. THEORETICAL BACKGROUND

There are many communications tools which companies can use to allow customers to contact them. Customer service through using web chat has become very popular amongst younger generation and it is supposed to overrule older types of communication such as telephone (Lockwood, 2017; Xu & Lockwood, 2021).

Web chat can be defined as "synchronous exchange by generating written text on phones and computers for customer service" by Lockwood (2017) or as web chat "refers to any kind of communication over the Internet which offers an instantaneous transmission of text-based messages from sender to receiver" by Elmorshidy (2011). Web chat also "may address point-to-point communications as well as multicast communications from one sender to many receivers" (Elmorshidy et al., 2015).

It is also important to define web chat widget, which is "discrete user interface object with which the user can interact" on website. Currently, web developers are providing ready-to-use solutions which can be customized by the

* Corresponding author.

companies on their websites as tailormade solutions can result in much higher costs along with issues with further development and security support (Melnyk, 2014).

Mostly, when customers use live web chat widget, they prefer to receive instant information about products, orders or shipping options (McLean & Osei-Frimpong, 2017). Web chats are not only used for commercial communication, but for example for physician–adolescent communication with pediatricians (Bravender, 2013) with having higher quality and comparably positive effects in comparison with telephone counseling (Stommel, 2016).

Implementing web chat provide instant support for customers with potential to increase sales. However, there are associated drawbacks such as significant investment of time and money. Moreover, it is very difficult to predict future return of this investment especially with operating costs (Software advice, 2015). Other benefits of implementing web chats are that it creates good opportunity to initiate live chat session to boost the sales or that in general it increases order value (Sherice, 2013).

According to the study made by Software advice (2015), almost 50% of population never used web chat on the website. The customers also significantly prefer phone communication over web chat in the case of financial queries. In the case of simple queries or shopping queries the preferences are almost equal. On the other hand, older study made by Enright (2011) stated that only 18% of customers prefer web chat over phone communication with merchant. This shows that the trend tends to favor web chat over traditional communication methods. The study made by Software advice (2015) continues that most of the respondents stated that the reasons why they would prefer web chat over phone communication are no hold times and higher comfort.

3. METHODOLOGY

The aim of the article is to analyze which websites of Czech spa resorts have web chat as communication tool available for customers and if there are any other communication tools available for the customers (phone, email or web form). The achieve the goal, there were analyzed 127 websites of spa resorts from 21 spa regions, which were listed at the website of Lázně Travel (2022). Websites can be divided into spa regions where they belong to (as it is possible to see at Fig. 1). Apart from the web chat, it was also analyzed which other communication tools the websites have.

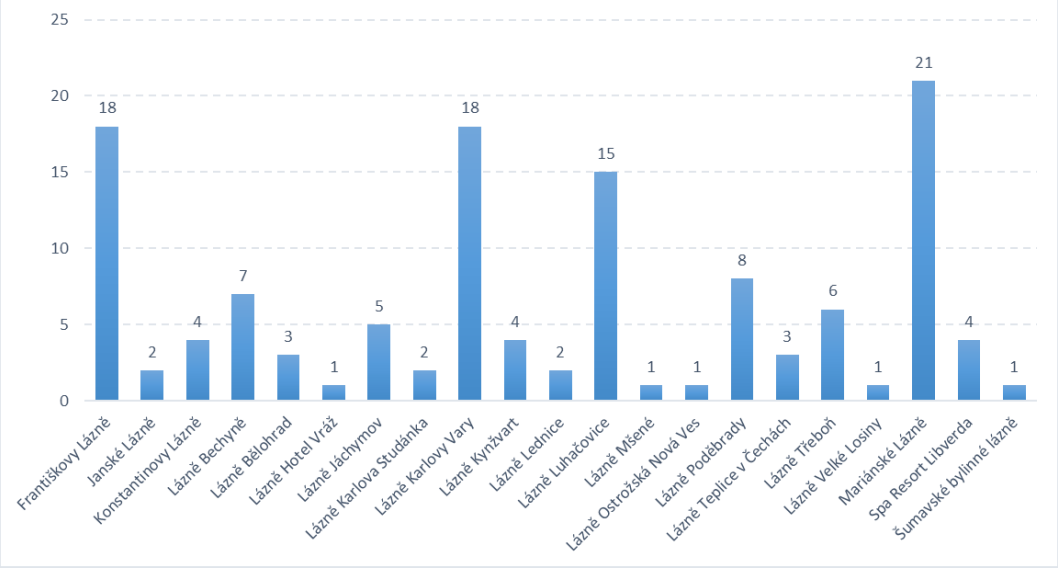


Fig. 1. Number of analyzed websites per spa region

The analysis of web chat went further as it was analyzed whether website provides this type of communication channel, but also which technical solution websites use (as it was anticipated by theory that websites are using ready-made solutions) and where web chats are placed. On Fig. 2, it is shown the typical web chat widget used on one of the analyzed websites.

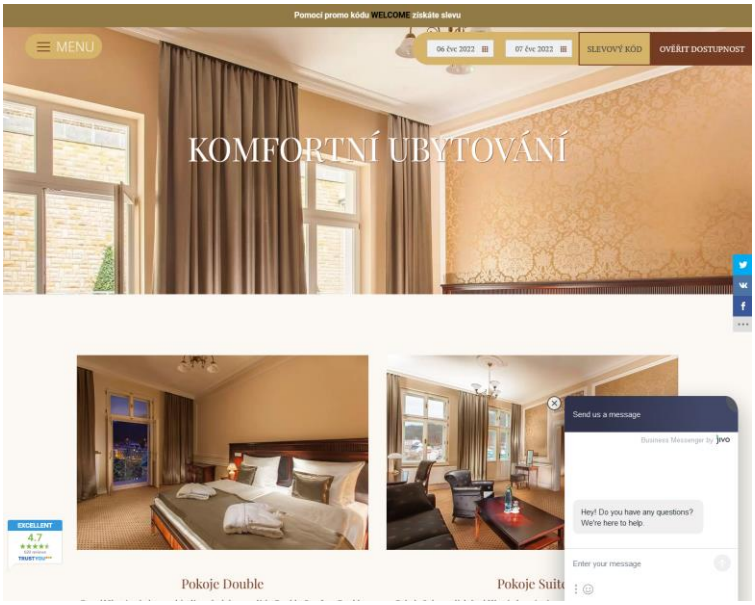


Fig. 2. Typical web chat widget from the research sample (Luxury Spa Hotel Olympic Palace, 2022)

4. RESULTS

By analyzing all 127 websites from the view of communication tools available for customer to get in touch with resort, it is not surprising that all of them has telephone and email contact. Interestingly, only 79 (62%) have web form available for customers to write query to a hotel management and only 14 websites (11%) have web chat available for the customers as communication tool. It is important to state, that many of the websites which has web chat, belong to the same domain or same owner. If we would group the websites which has the same domain or owner, only seven individual instances would emerge. The overview is shown in Table 1.

The results (little to no share of web chat usage on the websites) are in contradiction of the contemporary recommendations where web chats are advised to be widely used for communication with customers for potential increase value of the order. However, as it was stated in the theoretical background – implementation of the web chat technology requires relative high investment with uncertain return. Many of the analyzed websites are owned by rather smaller private hotels which can have different priorities (especially after Covid era).

Table 1. Available communication tools on websites to contact spa resort

Communication tool	Number	Percentage
Telephone number	127	100%
Email address	127	100%
Web form	79	62%
Web chat	14	11%

The analysis went further and it was observed which technology was used to implement web chat widgets. It is interesting that technical solutions vary significantly per website. Most of the solution used Daktela (36%) or Smartsupp (29%). However, it is important to state that the size of the sample does not provide very relevant outcomes. On the other hand, the results can provide interesting view on the current situation on the market. Fig. 3 shows actual proportions of the technical solutions of web chat solutions used on the spa resorts´ websites. The current trend is that there are ready-to-use solutions available for web developers which can be customized by the companies. This excludes tailormade solutions as it would be economically disadvantageous for the companies and the further development would be difficult to maintain. The usage of ready-to-use solutions can provide long term support with updates which are necessary for keeping up with security risks and marketing demands.

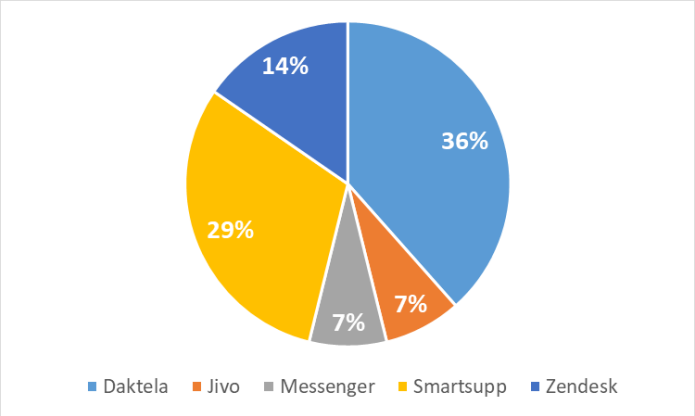


Fig. 3. Web chat technical solutions used on the spa websites

Finally, it was analyzed where web chat widgets were showed on the website itself. The position of the web chat widget can be different and as it is possible to see in the Table 2, most of the web chat widgets are shown on the bottom-right corner, but also bottom-left position on the website was used by web chat widgets.

Table 2. Position of web chat widgets on the websites of spa resorts

Communication tool	Number	Percentage
Top-left	0	0%
Top-right	0	0%
Bottom-left	4	29%
Bottom-right	10	71%

5. CONCLUSION

Live web chat is a modern communication tool which could provide many benefits such as opportunity to increase sales by initiating live chat session or that web chat in general has potential to increase order value. However, the disadvantages are mostly in higher implementation and operating costs. Moreover, from the recent studies it is evident that customers still prefer phone or email communication especially in the case of financial queries. Additionally, almost 50% of customers never used web chat on the website before. This creates challenge in mass implementation of the live web chat technology into websites.

This contribution focuses on the analysis of adoption and implementation of live web chat technology on the websites. The aim of the contribution is to analyze websites of Czech spa resorts from the point of view which communication tools are available for the customers and if they offer live web chat on the websites.

The analysis was performed on 127 websites, and the results are mostly in agreement with theoretical background – 100% of websites provide phone or email contact. Interestingly, only 62% of the websites contain web form which can be used to contact spa resort with any kind of queries and only 11% of websites had implemented live web chat widgets which can be used to ask questions directly.

From the point of view of web chat widgets itself, the websites are using different solutions. Many of the websites are using Daktela or Smartsupp solutions however in general the technology used vary significantly. The other analysis shows that most of web chat widgets are placed on bottom-right (71%) and only 29% of web chat widgets are placed on bottom-left. The placement is not that surprising as for example on Facebook, the position of the Messenger widget is also on bottom-right and customers are mostly used to it.

Overall, it is possible to state that live web chats are not widely used on the websites of Czech spa resorts even though they can provide certain benefits.

Acknowledgements

The article was created with support of University of West Bohemia.

References

[1] Bravender, T., Tulsky, J. A., Farrell, D., Alexander, S. C., Østbye, T., Lyna, P., Dolor, R. J., Coffman, C. J., Bilheimer, A., Lin, P.-H., & Pollak, K. I. (2013). Teen CHAT: Development and utilization of a web-based intervention to improve physician communication with adolescents about healthy weight. In *Patient Education and Counseling* (Vol. 93, Issue 3, pp. 525–531). Elsevier BV. https://doi.org/10.1016/j.pec.2013.08.017

[2] Elmorshidy, A. (2011). Benefits Analysis of Live Customer Support Chat in E-commerce Websites: Dimensions of a New Success Model for Live Customer Support Chat. In *10th International Conference on Machine Learning and Applications and Workshops (ICMLA 2011)*. IEEE. https://doi.org/10.1109/icmla.2011.167

[3] Elmorshidy, A., Mostafa, M. M., El-Moughrabi, I., & Al-Mezen, H. (2015). Factors Influencing Live Customer Support Chat Services: An Empirical Investigation in Kuwait. In *Journal of theoretical and applied electronic commerce research* (Vol. 10, Issue 3, pp. 63–76). MDPI AG. https://doi.org/10.4067/s0718-18762015000300006

[4] Enright, A. (2011). Live Chat Use Is on the Rise, Survey Says. *Digital Commerce 360*. Available at:https://www.digitalcommerce360.com/2011/05/10/live-chat-use-rise-survey-says/.

[5] Lázně Travel (2022). https://www.laznetravel.cz/ceska-republika.html

[6] Luxury Spa Hotel Olympic Palace (2022). Available at: https://olympic-palace.cz/

[7] Lockwood, J. (2017). An analysis of web-chat in an outsourced customer service account in the Philippines. In *English for Specific Purposes* (Vol. 47, pp. 26–39). Elsevier BV. https://doi.org/10.1016/j.esp.2017.04.001

[8] McLean, G., & Osei-Frimpong, K. (2017). Examining satisfaction with the experience during a live chat service encounter-implications for website providers. In *Computers in Human Behavior* (Vol. 76, pp. 494–508). Elsevier BV. https://doi.org/10.1016/j.chb.2017.08.005

[9] Melnyk, V. (2014). Accessible web chat interface. In *Proceedings of the 16th international ACM SIGACCESS conference on Computers - ASSETS '14. the 16th international ACM SIGACCESS conference*. ACM Press. https://doi.org/10.1145/2661334.2661415

[10] Sherice, J. (2013). 3 Ways Live Chat Software Can Improve Your Conversion Rates. *The Daily Egg*, Available at: https://www.crazyegg.com/blog/live-chat-software/

[11] Software advice (2015). *The Impact of Demographics on Live Chat Customer Service*. Available at: https://www.softwareadvice.com/resources/demographics-impact-live-chat-customer-service/

[12] Stommel, W. (2016). Information giving or problem discussion? Formulations in the initial phase of web-based chat counseling sessions. In *Journal of Pragmatics* (Vol. 105, pp. 87–100). Elsevier BV. https://doi.org/10.1016/j.pragma.2016.09.001

[13] Xu, X., & Lockwood, J. (2021). What's going on in the chat flow? A move analysis of e-commerce customer service webchat exchange. In *English for Specific Purposes* (Vol. 61, pp. 84–96). Elsevier BV. https://doi.org/10.1016/j.esp.2020.09.002

Analysis of Students' Digital Competences Needed on the Labour Market

Cristina NICOLAU[a,*], Christian STREMPEL[b]

[a] *Transilvania University of Brașov, Faculty of Economic Sciences and Business Administration, Department of Management and Economic Computer Literacy, Str. Colina Universității, corp A, sala AIII5, Romania, cristina.nicolau@unitbv.ro*

[b] *Transilvania University of Brașov, Faculty of Economic Sciences and Business Administration, study programme: International Business, 2nd year of study*

Abstract

This paper analyses the digitalisation of the labour market and examines students' digital competences with regard to their future employability on a labour market more and more digitalized. During the pandemic crisis of 2020-2021, the education has faced the challenges of online education which brought the need that both academic staff and students possess the technology needed for remote education as well as the digital competences of using it. By this piece of qualitative research, we found out that students were aware that they needed to develop more digital competences, but they did not elaborate proper educational strategies. Additionally, we highlighted relevant insights with regard to students' attitudes and opinions on the digitalised labour market and determined the challenges they face.

Keywords: labour market, digital competences, employability, ICT, educational strategies, crisis.

1. INTRODUCTION

Digital literacy is one of the newly set of requirements of the labour market, irrespective of the field of activity that the employers operate or their localization. In 2006, the European Union established the eight key competences for lifelong learning, of which digital ones was within. With Industry 4.0, digitalisation has increased so as (existing or future) employees need to adapt their educational strategies so as to meet the demands of the labour market which features more and more challenges with regard to increasing employability. And it seems to be further developed, making employers and employees alike to continuously invest in IT infrastructure and training, which may be problematic due to the lack of financial resources and time to learn (which produces shortages in production) or the rapid rate of technology replacement. Under such circumstances, a gap between existing and needed competences has appeared (Ancarani & Di Mauro, 2018) and the major cause seems to be technical innovations.

The academic environments have always put a specific focus on the development of digital competences. Nowadays, we observe that not only the academic curricula contain subjects and topic of Information and Communication Technology (ICT) but also various courses specific to every academic field, either economics, engineering, computer science or humanities. In the teaching and learning process, teaching staff and students alike use various computer-based applications and technologies so as to make it easier and more time-saving.

Under such circumstances, this paper focuses on the analysis of the level of digital skills that students have and its aim is to make students aware that the labour market is more and more digitalized so as they need to continuous develop their digital competences to be suitable for the jobs created and offered. It consists of a theoretical part which

* Corresponding author.

makes the correlation between the digital competences and the digitalisation crisis (the lack of digital competences) on the labour market. Secondly, it presents the methodology and results of a piece of qualitative research we undertook in 2022 with a group of students matriculated with Transilvania University of Brașov, Romania.

1.1. Digitalization crisis on the labour market

Markets, including the labour one, have been influenced by digitalisation. Long before the pandemic crisis of 2020, the labour force from the international labour market has been facing uncertainty, which is standard for and inherent to markets (Pirosca et al., 2021). Moreover, the increase in the rhythm of digitalisation has put a new focus on the labour market, making business consider their profits correlated to staff productivity and to costs with new ICT, whereas employees elaborate strategies so as to develop new digital skills (at their own will or at their employers' requests). We have to highlight that digital technologies have essentially changed business strategies, processes, products and services by deconstructing traditional ways of doing business (Hansen, 2019). In order to survive, employers do search for labour adapted to the digital needs of their businesses, businesses which implement more and more digital innovations (and this is the first reason which shows that there is a digitalisation crisis on the labour market); on the other hand, such labour is difficult to find (a second reason) whereas the requirements of active population on the labour market are difficult to meet and the tendency is to take the simplest jobs which do not need too much learning of digital technologies (a third reason) in spite of high salaries.

Education whatsoever is one of the strategic approaches to developing digital skills. The pandemic crisis started in 2020 showed the importance of digitalisation in the teaching, training and learning processes. The need to digitalise has increased and has determined all the stakeholders implied to adapt to the technology possessed, to invest in new one and to develop appropriate competences. This phenomenon happened under the circumstances given by the fact that the last decade has registered an increased growth in the number of the new technologies in the field of education (Guillen-Gamez & Mayorga-Fernandez, 2020).

The digitalisation process continuously leads to core changes in education and new jobs with new job descriptions, new work environments and new competences have appeared, making the adaptation of the organisations occur with a significant time lag (Matraeva, Vasiutina & Belyak, 2020) – a fourth reason. Under such circumstances, the labour market needs people who have already developed an average level of digital skills (difficult to find though) and who, accordingly, have increased their labour productivity.

1.2. Development of digital competences in academic institutions

Digital competences define a set of knowledge, skills and attitudes (Ala-Mutka, 2011) which provide the student the abilities to transform information into knowledge (Torres-Coronas & Vidal-Blasco, 2011). They represent today one of the core categories of competences needed on the labour market and with the increasing use of devices and software programmes in professional contexts, human work is facilitated as well as it becomes highly productive (Oberlander, Beinicke & Bipp, 2019).

Digital literacy consists of two types of competences: basic (as for example reading digital information, searching for online information, using simple applications to everyday life) and advanced (for instance, evaluating the quality of digital material, assessing the sources of online information, interpreting and applying digital contents in relevant contexts). To these two categories, we shall add the professional one which refers to the way the first two categories are used at work. In our view, this category shall receive a high focus in academic environments and subjects focused on ICT tools shall be developed so as to increase student employability during study years (the tendency to have a job during academic education has increased) or after graduation.

The taxonomy of digital competences (Oberlander, Beinicke & Bipp, 2019) consists of:

- Handling hardware
- Handling software (at least the basic software relevant for work such as mail and text programmes)
- Programming (using at least one programming language to do the job, create digital content and uphold systems)
- Handling applications (using digital environments and selecting from a various range)
- Innovating and creating digital content
- Processing information (searching for information, data analysis, evaluating resources, effective usage of information)

- Communication, cooperation (including sharing data) and networking by using appropriate channels and applications
- Netiquette (complying with the rules of digital communication) and ethics
- Cybersecurity and law
- Autonomy, independence and problem-solving
- Self-development and training others.

Academic institutions should focus more on this taxonomy and insert knowledge within their academic curricula, but only within knowledge triangles formed with businesses and research institutions. Cooperation with stakeholders may clearly validate the creating of competences and not only the accumulation of knowledge. In time, the proper competences shall be developed at their students, reducing the lacks on the continuously digitalised labour market.

2. RESEARCH METHODOLOGY

This piece of research focuses on the analysis of digital competences of students so as to design proper strategies to help increase their employability on the labour market. It had two general objectives:

GO1. To determine students' perception and attitudes regarding the challenges brought by the digitalised labour market so as to determine them to elaborate future educational digitally-focused strategies

GO2. To identify the students' digital literacy developed during their education and the future needs to improve them

The methodology of research comprises the qualitative research method based on a semi-structured instrument of research. The research instrument is original and consists of two parts:

1. A short questionnaire to characterize participants in terms of gender, age, field of study, level of study, study year, future job envisaged
2. A list of topics and sub-topics based on two major topics of discussion, as presented in Table 2, on which participants discussed openly and the interviewer took notes of their free responses, highlighting the most important opinions and attitudes.

Table 1. The qualitative instrument of research (source: original)

Topics of research	Sub-topics of research
1. On the digitalisation on the labour market	1.1. General issues on the digitalisation of the labour market
	1.2. Challenges that digitalisation brought to students and undergraduates
	1.3. Digitalisation of jobs. The most digitalised fields of activity
2. Digital literacy	2.1. Digital competences developed during schooling
	2.2. Costs of digitalisation enhancement
	2.3. Strategies to further develop digital competences

Research population is represented by students matriculated with a Bachelor study programme with a Romanian university. This group of population is the most numerous in the total number of students matriculated in Romania (Nicolau, 2017). As shown in Table 2, the researched population slowly decreased in number in 2021.

Table 2. The descriptive statistics of students matriculated at Romanian Bachelor programmes (source: www.insse.ro accessed on July 12, 2022)

Indicator	2017	2018	2019	2020	2021
No. of students,	408,179	402,696	407,373	418,346	401,902
of which male	189,434	185,630	187,735	191,547	n/a

The sample used in this qualitative research was formed from 5 participants who were presented the topic of the research and gave their consent to take part. They were interviewed individually and asked for their opinions to every sub-topic of the research instrument. Their characterization is the following: 100% are students matriculated with a Romanian university, 40% were female and 60% were male, 23.6 years is the group average with regard to age. Their study fields are: economics (40%), medicine (20%, law (20%) and humanities (20%). Of the group, 40% are in the

first two years of study. With regard to future jobs, 60% aim at a public service long-time career started-up from the jobs they would practice in their fields of study, whereas 40% stated that they would like to have their own businesses (one participant in food & beverages industry and one participant in e-commerce).

The data were collected and grouped according to the two research objectives. We highlight that in qualitative research, results are not representative from the statistical point of view, but relevant for the whole population analysed.

3. RESULTS AND DISCUSSION

3.1. Students facing the challenges brought by the digitalised labour market

The research participants considered that that labour market is opportunistic for academic students and undergraduates because there are more and more digitalised internships and working experiences and the staff shall adapt to the continuously changing process of innovating technology which includes both hardware and software. Moreover, the labour market offers many e-platforms which facilitate active population's employability.

When asked to describe in 3 words the labour market, participants formed two groups:

A) a group which shared positive qualifications and showed that the labour market is continuously changing ("volatile") and offers unlimited possibilities ("infinite", "fluid")
B) a group which highlighted the negative aspects: the labour market was "inefficient", "underestimated", "rigid", "disorganised", "limited" and "fragmented".

With regard to digitalisation, the main challenges that students determined were:

- Students found it difficult to adapt to digitalisation as they did not perceive it as a priority, especially before the pandemic of 2020-2021; however, at that specific moment in their lives, digitalisation was the key to all successful processes like education, work, family communication
- Students would use their ICT skills developed in their childhood, especially when playing computer games
- Students would have liked to learn more ICT in the school years before their admission to universities, especially the basic competences to help them develop the professional ones needed for their future jobs. Hence, the complexity of different internal programmes within a company may be a challenge
- Organisation of recording of all the documents in a company and updating archives seems difficult to digitalise.

Students stated that the most digitalised fields of activity are IT (especially software engineering), production (due to robotics), trade (with the large constitutive part of e-commerce), engineering (including online design) and human resources. Moreover, digitalisation is a "must-have" for every job, especially for a more rapid and efficient communication. Even if digitalisation seems difficult in some fields of activity like law, culture, art and forestry, to name some fields mentioned by the participants, innovation shall find solutions to meet the inevitable changes.

3.2. Students' digital literacy and strategies to develop

Romanian students are aware that there are fully digitalised jobs for which they need special training, like in medicine. The concepts of digitalisation "skills", "costs" and "future" were often mentioned during the interviews, showing that all of them felt the need to use better ICT and to update their knowledge. Generally, students stated that their main digital competences focused on Microsoft Office tools as well as on applications for emailing and messaging, social media, photo and video editing and work with digital files and folders. Only one participant stated that he learnt something totally new in his academic years: a statistical software.

Moreover, during the pandemic, some of them learnt to use educational tools for online conferencing, quizzes, sharing information and using whiteboards. When asked to self-assess their digitalisation level on the Likert scale from 1 (low) to 5 (high), the sample average was 3 (only 40% of the participants were below the sample mean). This correlates to the costs of digitalisation, which only two participants considered that they paid: one person could not provide a figure, saying that the company where he had done internship paid the costs for courses and applications learnt; another participant said he had paid approximately EURO 2,000 to develop the digital skills needed to start up his new business.

The main strategies for developing digital competences should come from the students' need awareness and the challenges of their future jobs and fields of activity. One participant highlighted that academic institutions shall identify both students' needs and the trends on the labour market in terms of digitalisation and meet them appropriately so as their undergraduates be successful on the competitive labour market. What students mentioned as strategies are:

- Practice during internships and jobs
- Learning by taking part to authorized courses
- Design a strategy of continuous learning based on the analysis of trends
- Watching tutorials in the field of interest and using in real-life situations.

4. CONCLUSIONS

In previous research (Nicolau et al., 2020) we underlined that there are several asymmetries in digitalisation in the developing countries like Romania. Digitalisation depends not only on infrastructure, but also on the level of the digital skills of the users of the infrastructure. Moreover, this research showed that academic students' and undergraduates' employability does depend on their capabilities, of which their digital competences are top ranked. In our view, the labour market is facing a crisis highly connected to the process of digitalisation as employers innovate and invest in technology, but the labour force does not know to operate, being too sophisticated to learn and use, irrespective of the benefits brought.

To conclude, sophisticated will also be the well-paid jobs offered on the labour market, so students shall be more aware about the future digital skills needed. They should perform a deep analysis of the trends in the field of activity they would like to develop their career and they should not wait for an employer or the right time to invest in their digitalisation.

Acknowledgements

The presentation and publishing of this paper was supported by Transilvania University of Brașov, Romania.

References

[1] Ancarani, A. & Di Mauro, C. (2018) Successful digital transformations need a focus on the individual: How does digitalization affect the behaviour of purchasers and team members in related functions? iIn Schupp, F. & Wohmer, H. (eds.) Digitalisierung im Einkauf, Wiesbaden: Springer Gabler

[2] Piroscă, G.I., Șerban-Oprescu, G.L., Badea, L., Stanef-Puică, M.R. & Valdebenito, C.R. Digitalization and Labour Market - A Perspective within the Framework of Pandemic Crisis. J. Theor. Appl. Electron. Commer. Res. 2021, 16 (pp. 2843–2857) accessed online at https://doi.org/10.3390/ jtaer16070156

[3] Hansen B. (2019) The digital revolution – digital entrepreneurship and transformation in Beijing, Small Enterprise Research, accessed online at https://doi.org/10.1080/13215906.2019.1570321

[4] Guillen-Gamez, F.D. & Mayorga-Fernandez, M.J. (2020) Quantitative-comparative research on digital competence in students, graduates and professors of faculty education: An analysis with ANOVA. Educ. Inf. Technol.

[5] Matraeva L., Vasiutina E. & Belyak A. (2020) The effects of digitalisation on the labour market: the case of Russia. Work organisation, labour & globalisation Volume 14, Number 2

[6] Ala-Mutka, K. (2011) Mapping digital competence: Towards a conceptual understanding accessed online at https://ec.europa.eu/jrc/en/about/jrc-site/seville

[7] Torres-Coronas, T. & Vidal-Blasco, M.A. (2011) Adapting a face-to-face competence framework for digital competence assessment. International Journal of Information and Communication Technology Education, 7(1) accessed online at https://doi.org/10.4018/jicte.2011010106

[8] Oberlander, M., Beinicke A. & Bipp, T. (2019) Digital competencies: A review of the literature and applications in the workplace, Computers & education, 146, accessed online at https://doi.org/10.1016.j.compedu.2019.103752

[9] Nicolau, C. (2017). Student with a job or no job? Qualitative research on students' motivators to have a job during their studies in Romania in Strategii Manageriale 1(15), pp. 482-492

[10] Nicolau, C., Henter, R., Roman, N., Neculau, A. & Micalus, R. (2020) Tele-Education under the COVID-19 Crisis: Asymmetries in Romanian Education, Symmetry 12(9) available online at https://doi.org/10.3390/sym12091502

Innovation in Businesses: An Overview

Arjeta HALLUNOVI[a*]

[a] *Finance-Accounting Department, University Aleksander Moisiu Durres, Albania, Email: arjetahallunovi@yahoo.com*

Abstract

In Albania is difficult to discuss about the research in the field of innovation because often the efforts invested in this aspect have been experimental and do not go deep into the problem. The purpose of this paper is to find a description and reference of the history of innovation, its definition, combination of various dimensions in the literature as well as its determinants studied up to today. The study in this aspect tries to have theoretical depth, producing new and systematized knowledge based on careful literature review, it aims at a systematic literature review in order to consolidate the concept of innovation in a less developed field and without a strong research base in the Albania. An alternative way to set in motion economies that are experiencing a slowdown in their growth, it is the innovation, which it has been treated as the new industrial revolution (Kumar and Sundarraj, 2016). Of course, it highlight the new paradigm according to which the engagement of new technologies and the use of existing technologies in different ways, enable the creation of a new economy and new opportunities for further developments. According to Taalbi (2017), it is confirmed a positive relationship between innovation and performance, so innovative firms actually have better performance. According to the recent data of June 2022 from the Word Bank, Albania is the last in the region with 0.15% of GDP for the research and development expenditure. Albania not only has the lowest level in terms of research and development but also has a deep difference with both European and regional countries.

Keywords: Innovation, Process, Phenomenon, Performance, Technology

1. INTRODUCTION

Innovation has been treated as the new industrial revolution and as an alternative way to set in motion stagnant economies (Deokar, Gupta, Iyer and Jones, 2018). According to Greco, Grimaldi and Cricelli (2017), the use of existing technologies in different ways and the engagement of new technologies enable the creation of a new economy, so, innovation represents the new paradigm. Changes, new ways of thinking and then living take time to adapt to reality. Theory divides the process into stages which are: inventors, early adopters of the idea, late adopters, and clumsy. Albania in the global context of innovation is in the fourth stage, that of the clumsy, so, it is in the last wave of diffusion. While on the other hand there are developed countries which have understood the importance of innovation and above all of scientific studies and its precise decades earlier. Starting with the linear conception of innovation, then treating it as a continuous process, and continuing with other models that many researchers and business model practices of large companies gave to the literature thus creating a multi-directional perspective in terms of innovation as a process and the factors that cause and influence it.

Archibugi and Filippetti (2018) argued that innovation began to appear for the first time in 1960s, it came from a special field of research and distanced themselves from universities studies. The main issue was related with the ability that the notion of innovation was used to characterize changes, so, the first studies in this field are not just focused on socio-economic studies and research. Park (2016) states that during the years the number of departments and research

* Corresponding author.

centers that focused on studying the role that innovation played in economic and social change grew rapidly. Acoording to Chege, Wang and Suntu (2020) the need to study innovation was extended to different directions by taking in consideration therefore that to obtain more complete knowledge about innovation it is neccesary to acquire knowledge from different disciplines such as, sociology, organizational sciences, management and business studies. Innovation in economic terms performs several functions (Cefis and Marsili, 2019):

- First, it is a key factor of an economy to compete in global markets. If you dont don't bring something better, cheaper, or faster, logically, no global market will accept you.
- Second, innovation affects the improvement of living conditions.
- Third, through innovation firms, individuals, economies and systems improve their productivity. This brings competition between firms and makes it possible for each firm to bring something new to the consumer.

The ability to give new products and services, it is in response of the recognize of market information from consumers, competitors and other operators. Also, it is noted that although it is not a new phenomenon, it has only received due attention in recent years. In general, the innovation and the impact it has brought to the economy and not only, have been studied mainly by those of the social sciences. Lee, Park, Marhold and Kang (2017) have stated that in recent years there has been an increase in socio-scientific publications focused on innovation. Responsibilities, as components of market orientation, prove to be good determinants of innovation and strong performance, despite the weaker effect it has on innovation rather than performance.

2. LITERATURE REVIEW

Dalgıç and Fazlıoğlu (2021) gave voice to innovation with his theoretical point of view looking at economics through static optics. According to him, innovation was what economic growth meant, and was a process of qualitative change that took place at a point in time and taking into account resource constraints. The same principle guides the difference between invention and innovation. While innovation is the first moment that man has found the invention is a function in the system to be economically viable, so it is the first marketing of the idea. Another innovation authority in the field of innovation Gupta, Gregoriou and Ebrahimi (2018) tried to give innovation a different perspective and stamped in research terminology the words disruptive innovation, a concept which will be detailed later. But if Ugur and Vivarelli (2021) were talking about innovation within firms, how and when they needed to engage more to have success reports, there are some innovation contexts to look at. Organizational learning and capacity building takes place in parallel with the overall market orientation process.

Referring to Wojan, Crown and Rupasingha (2018) in the process of innovation he has highlighted three main aspects that promoted the occurrence of an innovation: the first was the inherent uncertainty in all innovation projects. The second was the need to move fast before anyone else did, the fastest way had to be found to innovate. This innovation according to him included leadership and vision, two qualities that he associates with entrepreneurship. The third was the prevalence of "resistance to new ways" - or to inertia. Two other equally important definitions come in the last decade following research into the measurement of innovation and the effort of research institutions to formulate a measurement instrument and a methodological structure.

Strategic behavior is a key determinant of innovation. The strategy that an organization chooses by being proactive, aggressive or risk-taking directly affects innovation in terms of how the organization chooses to stand out from its competitors (Yoo and Kim, 2015). In order to achieve higher organizational performance, the literature argues that organizations must consider all elements of the external or internal environment in order to deliver innovative products or services (Aguinis, Edwards and Bradley, 2017; Koh, Lee and Joshi, 2019). Egami, Fong, Grimmer, Roberts and Stewart (2018) have argued that competition has moved forward and it will not be innovative thus losing its competitive advantage. It is noted that especially consumer orientation but also market orientation are not often the determining factor of innovative products or services. Sometimes the organization focuses on meeting current customer demands and missed to know about consumers, for what they are looking for, and as long as the (Yang, Bossink and Peverelli, 2017; Jak and Cheung, 2018).

3. INNOVATION OR COPY?!

According to McKenny, Short, Ketchen, Payne and Moss (2018), there are recognized three main sources, by organizational structure theories in adoption with innovation: imitation, acquisition and incubation. The first source mean that the firms have the predisposition to copy or imitate innovations inside or outside their market. Acquisition reflects the dispotion to assume the cost of a development by another firm through the acquisition, licensing, or merger of operators. According to Schepker, Kim, Patel, Thatcher and Campion (2017) the firm to develop its innovations through internal processes whether these are research - development or partnerships, as a source of innovation is called incubation. It is valuated important how much, how and where a manager would place the emphasis to get the most out of the potential source, that mean the difference between sources of innovation is important in terms of decision-making and managerial time (Short, McKenny and Reid, 2018). According to Tarka (2018) the distinction between sources of innovation is necessary in the range of policies that go beyond the organizational level of firms, ie at the macro level. It consequently impacts the size and speed of adaptation of innovation within the company structures, when a company it is forced or not, to choose the source of innovation that it will use (Muafi, Siswanti, Diharto and Salsabil, 2020).

4. CONCLUSIONS

Albania faces a different reality regarding innovation compared to developed countries. The "poor" literature, as well as the reality of making policies in relation to well-known innovation models of cooperation with different social levels or systems with special roles, or even in the creation of national innovation systems, make Albania to be , at best, out of context. The economic and political specifics are not an excuse for the economic situation as well as the innovation levels of our country. Countries like Albania have an imperative need to adapt to innovative policies and promote them in order to diversify the economy, increase productivity and market competition. Developed countries and economies are committed to an economy based on knowledge (knowledge economies). This fact means that economies are highly dependent on the knowledge, information and high skills of the workforce. Another equally important problem is the lack of strategies to orient the economy towards sustainable growth.

This would not only put the economic and social system in front of barriers that should have been passed in time, but facing such a reality would release an information and chaos necessary for the awareness phase of the system and stakeholders in the process. As the basis of the Albanian economy are small and medium enterprises, which makes the orientation and construction of growth strategies, based on knowledge, much more difficult. Another systemic problem that the Albanian economy has is related to macro-level expenditures related to R&D, only 0.4% of GDP goes to that purpose, when the European reference is 3%. It should be noted that the weak cooperation between the private, public and academic partnership indicates weak institutional links and a lack of system and vision. The educational system in Albania is not adapted enough to support innovative and entrepreneurial activities, also more than half of the scientific researchers with research skills have left the country. Here, it is worth noting that even the data for measuring and analyzing innovation are not reliable.

Innovation in economic terms performs several functions. First, it is a key factor for an economy to compete in global markets. Logically, no global market will accept you unless you bring something better, cheaper or faster.

Secondly, innovation affects the improvement of living conditions.

Third, thanks to innovation, firms, individuals, economies and systems improve their productivity. This brings competition between firms and makes it possible for each firm to bring something new to the consumer.

5. RECOMMENDATIONS

Business companies need to set up structures and properly plan the financial aspect of the R&D. Firms that do not have such capacities should benefit from open innovation which is massively in the market at a cost of almost 0, as well as be organized to create synergies which reduce the costs of research and development of products and services in the market.

Knowledge institutions such as: state agencies, state institutions and above all universities should work on creating a strategy for cooperation with business. Compared to other countries, there is no lack of cooperation between universities and business in the respective fields. The large market space which needs knowledge services and related

studies is almost totally uncovered. Also, universities should be massively oriented towards market needs and above all practicality or applicable principles.

Rules and procedures, improved or newly created (organizational innovation) are necessary in terms of innovation in the firm and its well-functioning. The analysis shows that they are positive in terms of benefits and naturally as a recommendation for businesses there is a need to better regulate organizational procedures, improve them in relation to time changes, and above all deepen them in the managerial organization of work.

Albanian companies in the knowledge economy should pay more attention to innovation by investing in people above all (human capital) and turning investment into a well-controlled, orderly and sustainable process.

The albanian state must formulate a well-thought-out innovation strategy. First, solid foundations must be laid for what academia and developed countries recognize as "National Innovation Systems." Second, the 7-year planning innovation strategy it is neccessary to be serious, professionally credible and reality-related, in order to be recomposed to reflect not only the latest developments, but further more. Third, given that the key to innovation and creativity are the university education systems and especially pre-university, there is a need to review the approach of both systems and their position in front of the market and society. The university education system has undergone the greatest distortion of a decade now, bringing to this apparent friction inconsistency with the needs of market and industry-specific businesses. Large albanian companies have set up training academies to meet the needs they have for employees and who cannot get them from the public system, not to consider it private at all. Industries such as ICT, banking, telecommunications, media and mining processing have created parallel educational institutions which re-qualify, re-educate and re-educate staff according to their standards and requirements, ie the market. So, a function that should have been fulfilled by the state and educational institutions to justify their existence, is being fulfilled by the businesses themselves. Therefore, an emergency reflection and an operationalization of some concrete steps in this direction is recommended.

Companies should pay more attention to strategic aspects of business organization. Longer decision-making horizons affect the degree of innovation and business performance.

Firms should pay special attention to the generation of market information and should have more sophisticated tools for data processing. Informality of information gathering makes businesses even more unsustainable or significantly increases the risk of decision-making based on such information. If the generation of information were from more reliable sources and stable and reliable data then the investment horizons would be different. Furthermore, firms need to sophisticate all three stages of market orientation such as information generation, dissemination to organizations through all media and response to that information after proper processing. Companies need to be more market-oriented, however they should not lose the balance of the modern economy when they also need to create a market.

Given the lack of R&D structures and departments in albanian organizations, the implication seems reasonable. Firms need to invest more accumulated knowledge by training employees, as well as documenting the firm's capacity as an institution in terms of "learning by doing".

References

[1] Aguinis, H., Edwards, J. R., & Bradley, K. J. (2017). Improving Our Understanding of Moderation and Mediation in Strategic Management Research. *Organizational Research Methods*, 20(4), 665–685. https://doi.org/10.1177/1094428115627498 .

[2] Archibugi, D., & Filippetti, A. (2018). The retreat of public research and its adverse consequences on innovation. *Technological Forecasting and Social Change*, 127, 97-111. doi:10.1016/j.techfore.2017.05.022.

[3] Chege, S.M., Wang, D. & Suntu, S.L. (2020). Impact of information technology innovation on firm performance in Kenya. *Information Technology for Development*. 26, 316–345.

[4] Cefis, E., & Marsili, O. (2019). Good times, bad times: Innovation and survival over the business cycle. *Industrial and Corporate Change, 28*(3), 565–587.

[5] Dalgıç, B., & Fazlıoğlu, B. (2021). Innovation and firm growth: Turkish manufacturing and services SMEs. *Eurasian Business Review, 11*, 395–419.

[6] Deokar, A. V, Gupta, A., Iyer, L. S., & Jones, M. C. (2018). *Analytics and Data Science*. https://doi.org/10.1007/978-3-319-58097-5

[7] Egami, N., Fong, C. J., Grimmer, J., Roberts, M. E., & Stewart, B. M. (2018). How to Make Causal Inferences Using Texts, 1–68. http://arxiv.org/abs/1802.02163.

[8] Greco, M., Grimaldi, M., & Cricelli, L. (2017). Hitting the nail on the head: Exploring the relationship between public subsidies and open innovation efficiency. *Technological Forecasting and Social Change*, 118, 213-225. doi:10.1016/j.techfore.2017.02.022.

[9] Gupta, J., Gregoriou, A., & Ebrahimi, T. (2018). Empirical comparison of hazard models in predicting SMEs failure. *Quantitative Finance*, *18*(3), 437–466.
[10] Jak, S., & Cheung, M. W.-L. (2018). Testing moderator hypotheses in meta-analytic structural equation modeling using subgroup analysis. *Behavior Research Methods*, *50*(4), 1359– 1373. https://doi.org/10.3758/s13428-018-1046-3
[11] Kumar, V., & Sundarraj, R. P. (2016). Schumpeterian innovation patterns and firm-performance of global technology companies. *European Journal of Innovation Management*, 19, 276-296. doi:10.1108/EJIM-05-2015-0034
[12] Lee, C., Park, G., Marhold, K., & Kang, J. (2017). Top management team's innovation-related characteristics and the firm's explorative R&D: An analysis based on patent data. *Scientometrics*, 111, 639-663. doi:10.1007/s11192-017-2322-1
[13] McKenny, A. F., Short, J. C., Ketchen, D. J., Payne, G. T., & Moss, T. W. (2018). Strategic entrepreneurial orientation: Configurations, performance, and the effects of industry and time. *Strategic Entrepreneurship Journal*, *12*(4), 504–521. https://doi.org/10.1002/sej.1291.
[14] Muafi, M., Siswanti, Y., Diharto, A. K., & Salsabil, I. (2020). Innovation culture and process in mediating human capital supply chain on firm performance. *Journal of Asian Finance, Economics and Business*, 7(9), 593-602. https://doi.org/10.13106/JAFEB.2020.VOL7.NO9.593.
[15] Park, S. (2016). Differences in technology innovation R&D performance creation behavior between for-profit institutions and not-for-profit institutions. *Park Springer Plus*, *5*, Article 451. doi:10.1186/s40064-016-2092-x.
[16] Koh, D., Lee, K., & Joshi, K. (2019). Transformational leadership and creativity: A meta- analytic review and identification of an integrated model. *Journal of Organizational Behavior*, *40*(6), 625–650. https://doi.org/10.1002/job.2355.
[17] Schepker, D. J., Kim, Y., Patel, P. C., Thatcher, S. M. B., & Campion, M. C. (2017). CEO succession, strategic change, and post-succession performance: A meta-analysis. *The Leadership Quarterly*, *28*(6), 701–720. https://doi.org/10.1016/j.leaqua.2017.03.001.
[18] Short, J. C., McKenny, A. F., & Reid, S. W. (2018). More Than Words? Computer-Aided Text Analysis in Organizational Behavior and Psychology Research. *Annual Review of Organizational Psychology and Organizational Behavior*, *5*(1), 415–435. https://doi.org/10.1146/annurev-orgpsych-032117-104622.
[19] Taalbi, J. (2017). What drives innovation? Evidence from economic history. *Research Policy*, 46, 1437-1453.
[20] Tarka, P. (2018). An overview of structural equation modeling: its beginnings, historical development, usefulness and controversies in the social sciences. *Quality and Quantity*, *52*(1), 313–354. https://doi.org/10.1007/s11135-017-0469-8.
[21] Ugur, M., & Vivarelli, M. (2021). Innovation, firm survival and productivity: The state of the art. *Economics of Innovation and New Technology*, *30*, 433–467.
[22] Wojan, T. R., Crown, D., & Rupasingha, A. (2018). Varieties of innovation and business survival: Does pursuit of incremental or far-ranging innovation make manufacturing establishments more resilient? *Research Policy*, *47*(9), 1801–1810.
[23] Yang, C., Bossink, B., & Peverelli, P. (2017). High-tech start-up firm survival originating from a combined use of internal resources. *Small Business Economics*, *49*, 799–824.
[24] Yoo, Y., & Kim, K. (2015). How Samsung became a design powerhouse. *Harvard Business Review*, 93(9), 72-12.

Teaching, Learning and E-learning (IAC-TLEl 2022)

Evidence Based Practice: Enhancing Students' Participation in Group Discussion and Group Work

Ali REZAEI[a*]

[a] *California State University, Long Beach, College of Education, Email: ali.rezaei@csulb.edu*

Abstract

For many instructors who want to use group work in their courses there is no evidenced based research to help them how to form groups or teams in their classes and usually wonder what works and what doesn't work. This paper summarizes the results of three years of the author's research in the area of collaborative learning. Two separate studies are reviewed, and a general conclusion is provided. The first study investigated the factors known to influence the process and the outcome of students' group work in online and onsite courses. The second study investigated students and teachers' attitudes towards group work in their courses. The overall results of this study indicate that the effectiveness of group work or group project depends on how the effectiveness is measured and how the group work is designed. The results showed a match between students and teachers' perspective regarding effective groupwork strategies. However, there was some mismatch between real practice and what the effective group work strategies suggested in the literature.

Keywords: Collaborative Learning, Group Work, Group Discussion, Peer Instruction

1. INTRODUCTION

Many teachers are using group work or group discussion as a teaching strategy in their courses. Group work is beneficial both for students and instructors. For students, group work motivates them, provides a peer instruction opportunity by looking at the problem from multiple perspectives and helps them to become more creative. For teachers, group work is an opportunity to give students more complex and more authentic assignments. A major research question for instructors is how a group work activity could be more effective and what type of group activity leads to a better outcome. The problem is many teachers design their group work assignment simply based on what they assume would work better rather than using an evidence based decision making (Rezaei, 2017).

Researchers in this field have compared different types of group work. Some have compared different group sizes and others have compared online and face-to-face group works. Most of those studies have evaluated the effectiveness of group work mainly through self-report evaluations rather than assessing a tangible outcome (Bennett, 2015). Furthermore, those studies have considered one factor at a time or have considered only one measure of success, therefore, the results of these studies are mixed, and it is hard to conclude which type of group work leads to better results. For example, in most of those studies only a single dependent variable (student satisfaction, amount of collaboration, or students' grade) has been evaluated. Yet, the results of research on the effectiveness of group work have not always positive and indeed some researchers have argued that group works in class is not useful at all (Qamar, Ahmad, & Niaz, 2015; Brown & McIlroy, 2011). There is a need to do more comprehensive research in which several factors are investigated together (simultaneously) to find the interaction effects among these factors.

The goal of this study is to do a more comprehensive investigation in which several factors are investigated together (simultaneously) to find the interaction effects among those factors. It is hypothesized that there is a

* Corresponding author.

significant interaction among these factors and perhaps that is why the results of earlier studies on the aforementioned single factors are not quite conclusive.

This paper reports the results of two separate quasi-experimental research studies on students' group-work and group discussion. The goal of this study was to identify factors that influence the success of group work in terms of student learning outcome as well as their interest and engagement in class activities and to find out why some researchers have not found group works to be quite successful. A second goal was to find what works for teachers who use group work in their courses and what students think about effective group-work strategies

2. THEORETICAL FRAMEWORK

Throughout the history of education, the most common teaching strategy used in classrooms has been lectures (Lammers & Murphy 2002). However, this strategy usually lacks many of the components of active learning, such as critical thinking, self-pacing, and the encouragement of dialogue and group discussion (Fredrick & Hummel 2004). The importance of collaborative learning is rooted in its potential for meaningful learning and social interaction. Various theorists, from Vygotsky (1986) to the situated learning theorists such as Lave and Wenger (1991), to the current social constructive theorists (Jong, Lai, Hsia & Lin, 2013), have stressed the importance of social interaction in learning. These theorists propose that learning occurs in a social or inter-psychological context prior to it becoming internalized or individualized within an intra-psychological category (Vygotsky, 1986).

Recently, some authors have questioned whether educators use groupwork just because it is popular or if there is hard evidence to prove its effectiveness (Brown & McIlroy, 2011). Indeed, there are some negative reports, most of the negative reports are coming from the areas of physical or medical sciences where students work together on a well-defined project and have specific goals to reach. For example, Qamar, Ahmad, & Niaz (2015) reported that "medical students' discussion intervention" showed poor results in terms of their mean scores in their final professional exam, their pass rates, and in terms of their perceptions of the course. These authors also report the results of other studies, which have revealed students' negative perspectives regarding the worth of "problem oriented interactive sessions." In a study about course groupwork in China, students reported: uncertainty about the accuracy of the knowledge acquired, time wasted during the session, inadequate focus in teaching, and heavy workload for the students (Huang, 2005). In a more recent study, Brown and McIlroy (2011) reviewed several articles on students' perspectives about groupwork and concluded that rather than learning to value group collaboration, usually, students learned to hate it. The question is why these students were not happy about their groupwork and what instructors could have done to change the situation. As Chapman (2005) stressed, "working and discussing with others per se will not necessarily result in higher learning" (p. 289). Asking a group of students to decide if they preferred individual or groupwork, Brown and McIlroy (2011) found that 68.9% preferred to do individual projects, 26.4% preferred group assignments and 4.6% had no preference. They reported that students' comments mirrored those issues raised in the literature review regarding time management, personal control, and concern over the quality of the outcome (Cartney & Rouse, 2006).

In summary, while there are many studies which support group work and group discussion and most of them have reported positive results, some studies indicate that group work is not always successful and that designing a collaborative environment is not always easy. A closer look at the literature shows that educators have used various group sizes and various ways in assigning students to groups and various types of assignments for group work. Specifically, six factors have been found to play significant roles in the effectiveness of group discussion including mode of instruction (face-to-face vs online), type of task (convergent vs divergent), anonymity of participants, homogeneity of students in terms of their skill level, peer assessment, and finally, group size (Rezaei, 2018). Using a quasi-experimental design and a descriptive survey design in the following two studies, the author investigated how these factors interact with each other in practice.

3. STUDY 1- GROUP WORK IN ONLINE AND ONSITE COURSES

3.1. Methodology

Four hundred and forty-seven students participated in this study. All participants were graduate students attending a public university in southern California who had taken at least one course with the researcher in a three year period. In each course, at least one type of group work or group discussion activity was used. Of these assignments, eight were conducted online (virtual environment) and the remainder (17 assignments) were done in a physical classroom. Some of these assignments were a simple collaboration on a quiz and some involved larger projects requiring students to do a mini research study and to write an essay collaboratively. Some of the assignments required finding specific

answers (convergent assignments), and others required exchanging ideas and summarizing the results of a group discussion (convergent assignments). Most assignments were graded by the instructor; however, some assignments were evaluated both by the instructor and the peer group, and just a few assignments were evaluated by peer group only. The evaluation of learning outcome or group performance involved either a rubric or some grading criteria assessing the quality and accuracy of the final product of the group work. Another dependent variable was the level and quality of collaboration (contribution to group work) as measured by a given rubric.

3.2. Results

Six major factors including mode of instruction (face-to-face vs online), type of task (convergent vs divergent), anonymity of participants, homogeneity of students in terms of their skill level, peer assessment, and finally group size were found to play significant roles in the effectiveness of group discussion. The most important conclusion of this study was the results that was revealed through the factorial analyses of variance. For example, the results showed while face-to-face group work leads to a better learning outcome (final product) and it leads also to higher student satisfaction, but online group work leads to more collaboration. This finding contrasts to earlier studies reporting face-to-face courses to be more productive in terms of collaboration among students. However, if we consider the interaction with other factors, this contrast could be easily explained. For example, it was found that students perform better in face to face course only if the task is convergent. Another reason might be due to the fact the author required students to document their contribution to the group work in the online courses. This policy might have encouraged (forced) students to participate in all stages of group work. Conversely, this finding supports earlier studies claiming that students prefer face-to-face group work over online group work (Smith et al., 2011). Apparently, the logistical difficulties of working in groups are harder to resolve in online courses.

The second finding was that students performed better in convergent tasks in comparison with their performance in divergent tasks. However, if we consider the interaction with other factors, we'll notice that this is true only if the course is fact-to-face. In virtual courses, students perform better in divergent tasks rather than convergent tasks. In face to face courses, students know each other. Therefore, if they work on a convergent task such as a science project, they can assign tasks to students who are the best in those tasks and as a result, the final project is going to be of high quality. On the other hand, in divergent tasks such as group discussions in social issues, the more the students know each other, the less there is a chance that they disagree on a social issue, and there is no real discussion or real exchange of ideas among homogenous groups. This is exactly the opposite in online courses. As mentioned earlier, in an online environment, students are much braver to challenge each other's ideas and to defend their own viewpoints. Thus, in such environment there is a higher chance for a more meaningful and a more productive discussion and a higher quality final outcome. As another example, in face-to face courses, the author observed that when students were allowed to work on a quiz or on a problem-solving activity (a convergent task), they perform better than when they had to work in a research project (a divergent task). This is quite consistent with another finding in this study indicating homogenous groups performing better on convergent tasks and heterogenous groups performing better on divergent tasks.

Another important interaction was found between group size and the type of the task. Earlier studies had reported that smaller groups (2-4 students) perform better than larger groups (5-8 students). As expected, smaller groups performed better on convergent tasks particularly in physical courses. Larger groups performed better on divergent tasks, particularly, in online courses. The results of this study suggest that teachers should not rely merely on research findings that have focused only on one factor at a time. For example, while many studies have suggested that small groups usually perform better than large groups, if the task is divergent and the goal is greater collaboration, then small groups may not be the best option.

4. STUDY 2- TEACHERS AND STUDENTS' OPINIONS ABOUT GROUP WORK

4.1. Methodology

For this study, a survey was developed based on these six factors and also based on the advantages and disadvantages of groupwork as reflected in the literature. The survey was sent to a group of 800 faculty in a Southern California university campus. Only faculty who had used groupwork in courses were asked to complete the survey. A total of 131 faculty who were using group work in their courses completed the survey. The sample included new and senior faculty from colleges of education, arts, business, health, science, and liberal arts. Among faculty who completed the survey 68 % were female and 33% were male. Most participants were from the college of Health and Human services (28%) and college of liberal arts (24%). About 40% of participants' age was more than 50 and about

63% had more than 10 years of teaching experience. The survey included 3 types of questions. The first part included simple demographics. The second part included questions regarding how and how much/often they used groupwork in their courses. The third part of the survey asked faculty's opinion about what works and what does not work in groupwork assignments.

4.2. Results

Overall, results show both faculty and students trust the importance of groupwork and have found it to be quite useful. Nevertheless, not all faculty believed in the value of groupwork assignments and even those who do believe, usually do not allocate a large portion of their course grade to groupwork. In this study faculty have expressed their opinions about the advantages and limitations of groupwork assignment. None of the respondents believed that online group discussion was more effective than in-class group discussions. In fact, 58% of faculty stated that groupwork is more effective when it happens entirely in class, 25% believed that groupwork is more effective when it happens face to face but outside classroom, and 18% believed that group discussion is more effective when it is done partially online and partially in class.

Moreover, four percent of faculty reported that they believe groupwork is more effective when the instructor is not involved in the processes of students' groupwork. Fifty percent of faculty reported that they believe groupwork is more effective when the instructor is moderately involved in the processes of students' group work and 36 percent of faculty reported that they believe groupwork is more effective when the instructor is minimally involved in the processes of students' groupwork. Finally, 11% of faculty reported that they believe groupwork is more effective when the instructor is highly involved in the processes of students' groupwork.

A majority of faculty (75%) reported that they believe group discussion is more effective when group members know each other to some extent and only 11% believed that group discussion is more effective when group members know each other very well. A similar percentage of faculty (13%) believed that group discussion is more effective when group members do not know each other at all About 58% of the instructors believed that if we let students choose their group members the groupwork will be more effective, however, 42% think it is better if the instructor assigns students to groups either randomly or based on their abilities.

The results also showed that not all faculty follow the procedures suggested in the literature to improve the effectiveness of their groupwork assignments. Another goal of this study was to see if there are any differences among faculty from different disciplines, on their views towards groupwork assignments. Surprisingly, no significant differences were found among faculty from different disciplines in terms of their groupwork teaching strategies.

All 177 students who responded the survey stated that they have taken courses in which they have been assigned groupwork activities. In fact, about 70% of students had participated in group activities more than five times, and about 50 percent of them believed that groupwork is helpful.

Regarding optimum group size, faculty and students almost think alike and both prefer groups of 3-4 students. However, students believed teachers should be more involved in students' group discussions. Both faculty and students believed that groupwork is more effective when it happens face to face. However, the results show that in comparison with faculty, students are more in favor of online groupwork than their instructors. Comparing faculty and students' perspectives show that faculty are more in favor of anonymous groupwork while students prefer to work with students who they know well. Similarly, in comparison with faculty, more students believed that faculty should let students choose their group members. Like faculty, a larger percentage of students believed that divergent tasks are more appropriate for groupwork.

Similar to the data from beliefs of faculty, 27% of students reported that they believe groupwork should only be evaluated by the instructor and only 7% believed that groupwork should be evaluated merely by group members. Most students (65%) believed that both the instructor and students should be involved in groupwork assessment. Students and faculty also held very similar opinions about grading groupwork assignments. Most students (51%) reported that they believe group discussion is more productive when two grades are given, one for the final product and one for individual contributions. Students' perspectives were like faculty regarding the weight of groupwork in the course grade. Seventy one percent of students believed that groupwork assignments should not be considered as a large portion of a student's total grade in the course. Still, 29% of students believed groupwork is more effective when the group project assignment makes a big portion of a student's total grade in the course.

Finally, a major difference between faculty and students was found in their opinion about the task distribution among group members. About 50% of faculty believed that each group member should contribute to all tasks in each assignment, while only 27% of students agreed with this and the other 73% preferred that the instructor assigns specific tasks to individual group members. Another significant difference between faculty and students' perspectives appeared in their answers to the open question regarding the benefits and drawbacks of groupwork. According to

students, the most important benefit of groupwork is to learn about different perspectives on a specific issue, followed by the opportunity to learn and understand better. Surprisingly, one issue faculty did not mention in their responses was the reduction in workload for students, and another was the opportunity to socialize with other students and find/make new friends. Another difference was in the variety of benefits mentioned by faculty and students. Faculty listed a lager variety of benefits (as listed above); however, students concentrated only on a few benefits.

5. CONCLUSION

The results of this study suggest that teachers should not rely merely on research findings that have focused only on one factor at a time. For example, while many studies have suggested that small groups usually perform better than large groups, if the task is diver-gent and the goal is greater collaboration, then small groups may not be the best option. On the other hand, when teaching online, and the group is large, it is better to assign divergent tasks for group work. If teaching face-to-face and the goal is a higher quality final product, one should assign convergent tasks. It is suggested that if the goal is for all students to reach at a specific level of learning or to reach a specific level of achievement, then perhaps heterogeneous grouping is the best option, however, if the goal is to have students maximize their capacity as learners, homogenous grouping may work better. The results of this study also support earlier studies finding students to prefer face-to-face group work over online group work. However, this study's results show that students collaborate more and more equally in online group work, particularly, when the task is divergent, and student's participation is evaluated both by the instructor and peer group.

Faculty assign groupwork for various reasons. Most faculty assign groupwork because they believe students learn better when they learn together. Other faculty assign groupwork to improve students' teamwork skills, motivate and engage students, and help them to see other perspectives. While some students believe online groupwork is more beneficial than face to face, a majority of students and all of the faculty who participated in this study disagree with this. It looks like the newer generation of faculty and students are more satisfied with their online groupwork experiences.

Most of the findings of this study support that common practice by faculty matches with students' expectations and there is not a big mismatch between students' viewpoints and faculty's practice. However, some of the findings are different from what has been suggested in the literature. For example, it had been argued that if group members know each other very well, they may be influenced by interpersonal relationships and peer pressure, which can cause group members to interact in less academic ways (Jong, Lai, Hsia & Lin, 2013).

Students' comments in this study indicate that not all tasks merit a groupwork. Some students report that while they enjoy group discussions in class to learn about other perspectives, they do not necessary enjoy working together as a team on specific projects. Students like their faculty to get more involved in their groupwork, and particularly in online group discussion, they need faculty to be present. The majority of students prefer to be evaluated by the instructors rather than by their peer group. A major concern expressed by students is their difficulty in setting up meeting times outside classroom. They suggest teachers help them with the time setting. Another group work drawback mentioned by students is poor communication by the teacher and other students. They need their instructors to communicate with them more often and create rules and procedures for students' communications after class. They also suggest that instructors should train students in the basics of teamwork and how to work in groups effectively, and they recommend teachers to be very clear in their expectations for group projects. Finally, if the groupwork is expected to be done online, students suggest that instructors should teach some basic applications of online technologies.

These findings are important because for many instructors who want to use groupwork in their courses there is no evidenced based research to guide them. The findings help them to decide how to form groups or teams and to find out what types of tasks are more appropriate for which type of grouping. It is also important because some comments from students can really help faculty to design more effective groupwork assignments.

References

[1] Bennett, T. (2015). Group Work for the Good; Unpacking the Research behind One Popular Classroom Strategy. *American Educator, 1*, 32-43.

[2] Brown, C. A., & McIlroy, K. (2011). Group work in healthcare students' education: what do we think we are doing? *Assessment & Evaluation in Higher Education*, 36(6), 687-699.

[3] Cartney, P., & A. Rouse. (2006). The emotional impact of learning in small groups: Highlighting the impact on student progression and retention. *Teaching in Higher Education 11*, 79–91.

[4] Chapman, H. (2005). Towards effective group-work in nurse education. *Nurse Education Today, 26*, 298–303.

[5] Huang, R. (2005). Chinese International Students' Perceptions of the Problem-Based Learning experience. *Journal of Hospitality, Leisure, Sport & Tourism Education, 4*(2), 36-43.
[6] Fredrick, L. D., & Hummel, J. H. (2004). Reviewing the outcomes and principles of effective instruction. In D. J. Moran & R. W. Malott (Eds.), *Evidence based education-al methods* (pp. 9–21). San Diego: Elsevier Academic Press.
[7] Jong, B., Lai, C., Hsia, Y., Lin, T., & Liao, Y. (2014). An exploration of the potential education value of Facebook. *Computers in Human Behavior, 32*, 201–211.
[8] Lammers, W. J., & Murphy, J. J. (2002). A profile of teaching techniques in the university classroom: A descriptive profile of a US public university. *Active Learning in Higher Education, 3*, 54–67.
[9] Qamar, M. R., Ahmad, A., & Niaz, K. (2015). Learning through small group discussion versus didactic lectures. *Pakistan Armed Forces Medical Journal, 65*(3), 386-90.
[10] Smith, G. G., Sorensen, C., Gump, A., Heindel, A. J., Caris, M., & Martinez, C. D. (2011). Overcoming student resistance to group work: Online versus face-to-face. The Internet and Higher Education, 14, 121-128.
[11] Rezaei, A. R. (2018). Effective Groupwork Strategies: Faculty and Students Perspectives. Journal of Education and Learning, 7(5), 1-10.
[12] Rezaei, A. R. (2017). Features of successful group work in online and physical courses. The Journal of Effective Teaching, 17(3),1-19.
[13] Vygotsky, L. (1986). *Mind in society*. Cambridge, MA: Harvard University Press.
[14] Wager, T. H., Caroll, W. R. (2012). Examining Student Preferences of Group Work Evaluation Approaches: Evidence from Business Management Undergraduate Stu-dents. *Journal 0f Education for Business, 87*, 358–362

Scholarships, Grants for Young Researchers under the Umbrella of the CA19104 COST Action

Cecilia SIK-LANYI[a*], Jinat ARA[b], Geraldine LEADER[c], Zeynep ŞAHİN TIMAR[d]

[a] *University of Pannonia, Department of Electrical Engineering and Information Systems, Egyetem Str. 10, 8200 Veszprem, Hungary, lanyi@almos.uni-pannon.hu*
[b] *University of Pannonia, Deparment of Electrical Engineering and Information Systems, Egyetem Str. 10, 8200 Veszprem, Hungary, jinat.ara@virt.uni-pannon.hu*
[c] *National University of Ireland Galway, Irish Centre for Autism and Neurodevelopmental Research, Institute for Lifecourse and Society, H91TK33 Galway, Ireland, geraldine.leader@nuigalway.ie*
[d] *Karadeniz Technical University, Hacı Baheddin Ulusoy Cad, Çamlı Mah. 61080 Trabzon, Turkey, zeynep.sahin@ktu.edu.tr*

Abstract

The presentation introduces the short study and conference attendance support opportunities for young researchers and Ph.D. students in Europe. The Marie Sklodovska-Curie Actions (MSCA), OeAD, DAAD, ERASMUS programs, Campus Mundi, Stipendium Hungaricum Scholarship, and COST Action grand awarding are the scholarship programs whose aim is to serve the growth of the EU's intellectual capital. Since the European Union has realized the importance of intangible assets, such as intellectual capital, they started to provide a supportive environment for student mobility. Therefore, addressing the importance of the offered scholarship in Europe, in this conference lecture, we attempted to present the potentiality of the addressed scholarship programs connected with the EU and help them improve their policy. Moreover, an example from the COST Action, CA19104-advancing Social inclusion through Technology and EmPowerment (a-STEP) has introduced addressing various supporting activities [1].
The main objectives of the Action a-STEP are to (i) evaluate and synthesize research among PanEuropean network and beyond on enhancing social inclusion through AT in an international context, (ii) connect and promote knowledge transfer between the users, researchers, practitioners, and SMEs, (iii) integrate ongoing research in an interdisciplinary (social sciences, rehabilitation, psychology, medical, engineering, technology), inter-country, and intersectoral (research, industry, policy) network, (iv) bring together research projects in a collaborative activity among pan-European network and beyond [2].
This Cost Action has several awards:

- Short Term Scientific Mission (STSM),
- Virtual Mobility,
- Virtual Networking,
- Inclusive Target Countries (ITC) Conference Grant.

The goal of the CA19104 COST Action, the Conference Grants, and STSM Grants will be presented during the conference in more detail.

Keywords: higher education, international mobility, COST Action, Ph.D. grant, young researcher.

* Corresponding author.

References

[1] CA19104 – advancing Social inclusion through Technology and EmPowerment: https://www.cost.eu/actions/CA19104/#tabs|Name:overview
[2] a–STEP project, https://www.a-step-action.eu/project/

The Social Benefits of E-learning in The Practice of Social Work

Gheorghiţa NISTOR[a*]

[a] *University of Bucharest, Faculty of Sociology and Social Work, Department of Social Work, Bd. Schitu Măgureanu, N.9-11, Bucharest, Romania*

Abstract

The use of information and communication technologies (ICT) in learning strategies (E-learning) facilitates access to education for a large number of students/learners. The changing educational context has led to changes in the content of what is learned, the way students learn, changes in when and where place they learn, but also in what they learn and who teaches. The social benefits and advantages of E-learning methods in the education of learners but also in the provision of social services in the practice of social work are obvious. The main social benefits of E-learning aim at student/learners control, accessibility, availability and personalization of strategies according to individual educational and social needs, benefits that have been used successfully, especially during the Covid-19 pandemic. The use of E-learning platforms allowed the continuation of the activity with those disadvantaged individuals and groups who needed specialized interventions, therapies and social counseling. Special education for children with disabilities/special needs, access to medical services for the elderly alone, are just two examples of activities that use adapted E-learning strategies for vulnerable social groups. The research is based on a secondary analysis of data, an analysis of the literature that presents specific E-learning interventions on vulnerable social categories (in the pandemic period, and not only). The results present the social benefits and advantages of using different E-learning platforms in training learners/students/specialists but also in continuing the activities of social work professionals working with different categories of beneficiaries (therapeutic activities, education for children with special needs, the elderly).

Keywords: social benefits, E-learning, social work

1. INTRODUCTION: ARGUMENTS REGARDING DIGITALIZATION AND CONTINUOUS LEARNING

Our society is affected by the increasingly rapid and accelerated development of information and communication technology (ICT), digital service platforms or artificial intelligence. Everyday life is affected by new ways to communicate, shop or work, aspects reflected in all areas of our society. ICT makes our lives easier, and technology is constantly expanding and improving. That is why, at the EU level, in the digital agenda for the decade 2020-2030 (this being the second agenda; the first was for the period 2010-2020) the creation of safe digital spaces and services, the consolidation of Europe's digital sovereignty, elements which must be followed in the measures within the sectoral social policies.

In the Treaty on the Functioning of the European Union (TFEU), the EU provides a number of provisions on research, technological development and space (Articles 179 and 190), education, training, youth and sport (Articles 165 and 166) and culture (Article 167) (EU, Digital Agenda for Europe, 2020). Given the pandemic period we have faced, in March 2021 the EU proposed a Compass for the Digital Dimension (COM(2021)0118), which provides for the achievement of four major digital objectives by 2030, in the field of digital skills, business , infrastructure and public services. We are interested in training and acquisition of digital skills and services because they have very high targets: at least 80% of adults must have basic digital skills, to have more than 20 million ICT specialists

* Corresponding author.

employed in the EU, in which the share of women it has to be bigger and bigger. At the level of public services, these should all be available online, we should all have access to medical records and use electronic identity solutions in proportion to 80%. In the direction of digital development and to become a world leader in innovation, Europe should combine advanced technology with industry, develop an artificial intelligence ecosystem that benefits all European citizens.

For citizens, these benefits should be visible in all areas, from the provision of better medical, social and educational services to which more and more people have access, reducing the costs of providing these services, the development of a legislative framework regarding the security of citizens, respect for rights and freedoms (C.E., 2020, WHITE PAPER. Artificial intelligence - A European approach focused on excellence and trust). Particular emphasis will be placed on educating citizens on the use of digital technologies, with the EU supporting the sustainable and effective adaptation of Member States' education and training systems to the digital age, by promoting the development of a high-performance digital education ecosystem and improving skills and competences digital, and artificial intelligence should be based on respect for values, privacy and human dignity. The COVID-19 pandemic has accentuated pre-existing inequalities between countries, but also within countries. We have had to face challenges such as social isolation, loneliness, education and digital inclusion, new forms of poverty or food crises. We cannot ignore the fact that the COVID-19 pandemic has accelerated the digitization of our societies and the need for inclusive social policies in a digital environment. More than ever, without digitization we cannot talk about social inclusion or welfare and social security in a period of continuous ICT development.

The International Council on Social Welfare (ICSW) proposes (after 90 years of activity) a key objective: improving social protection and welfare for all people, where digitization represents a collective, global challenge for all users: social systems professionals, social workers, providers/administrations/organizations providing social work services, beneficiaries (Peláez A. L., 2021). We cannot discuss social inclusion without digitization, and social welfare systems will be influenced by the developed digitization models (p.455-456). More aspects of social work are taken into account: the protection of citizens' rights in the relationship with increasingly digitized institutions, which offer more services and benefits have a digital gateway; the digital divide, access to services, knowledge and skills, access to training and continuous improvement. So, the digital skills of social workers/professionals working in the field of social welfare (including social workers), but also of citizens, beneficiaries of social services, are important.

2. THE USE OF E-LEARNING IN THE PRACTICE OF SOCIAL WORKE IN WORKING WITH DIFFERENT VULNERABLE GROUPS

The question is how we will be able to use and transform digitization into an opportunity to offer more social work services and allow access to them by as many citizens as possible, to interact more easily with public administrations. This implies that the acquisition of digital skills for professionals must be done in universities, be an integral part of university curricula. Digitization will not replace social interventions or face-to-face interviewing in the community, but it points us towards new ways to turn digitization into an advantage and provide support to as many people as possible, especially in certain conditions of social isolation, forced by medical factors (such as the COVID-19 pandemic) or very large social distances and gaps. If we know how to use ICT more effectively as providers, managers and users of social services in overcoming disparities between vulnerable social groups, then we will have lasting effects on social welfare and human well-being. Digitalization will also lead to better coordination of priorities in the field of social services, but also requires skills training for service providers and service users. (Peláez, A. L., 2022, p. 568-page 569).

The COVID-19 crisis has shown us the importance of social protection systems, but also the differences between the education, health or social work systems between the countries of the world, and how developed they are within the countries. Tele-medicine, distance education, were words that were very often spoken during the period of social and physical isolation, blocking access to services that citizens needed and that would not have been possible without digitization and access to ICT. Therefore, in social work practice it has been a challenge for professionals to continue working online, providing counseling and therapy through ICT. It was also a challenge for users of social services, therapy or medical services, because it required the possession of technology but also the knowledge and digital skills necessary to access and maintain relationships and contact with professionals: social workers, therapists, doctors, etc. The impact of the pandemic was evident on economically disadvantaged, vulnerable people without access to medical services, social workers encountering difficulties in respecting the principle of social justice and respect for human rights (Amadasun, S., 2020). Social workers have had to assume the roles of

educators, counselors and mediators between service-providing institutions and users, between care users and caregivers, approaching different strategies for resilience and building social relationships, sometimes combining in their professional practice and elements of spirituality, because some elderly families or individuals managed to obtain comfort and balance from these dimensions (p.755). In other systems, in the field of remote social work in Bulgaria, in the relationship with clients the most significant difficulties were related to building trust, security, compliance with professional ethics, the quality and efficiency of the services offered (Budeva S., 2022).

If before the pandemic, the integration of ICT in the practice of social assistance was linked to the field of health and mental health, recently digitization has offered possibilities for intervention in community social assistance, social workers considering the integration of E-therapy with other activities in their practice, especially in work with disabled persons, caregivers of the chronically ill, new parents, the chronically ill, and teenagers (Cwikel, J., Friedmann, E., 2020). Following the literature review, we see that the use of information and communication technologies has far-reaching implications for social work practice. For example, in Spain, youth support and training networks have been created to reduce "e-exclusion" and promote "e-inclusion" of the unemployed, the unemployed (Raya Diez, 2018, in Cwikel, J., Friedmann, E., 2020). The concept of E-therapy or electronic therapy, synchronous or asynchronous, refers to the establishment of a therapy session between a social worker and a client, mediated by ICT (a web camera, a video conference). The advantages of E-therapy during the period of social isolation referred primarily to the continuation of communication with specialists, the reduction of anxiety and depressive disorders, the continuation of communication and the realization of educational interventions with children with special education needs (SEN), with disorders on the autistic spectrum, not limited by geographical or medical barriers to. (Wang, Y., Gao, Q., Cheng, Z., Zhang, J., Wu, Y. (2021); Mukhtar K, Javed K, Arooj M, Sethi A., 2020); Southey, S., Morris, R., Saini, M., 2021); O'Leary, P., Tsui, M., 2021). The relatively low cost and increasing access to electronic communications has made it possible to provide online mental health and social care services through the use of electronic therapy (Skype, Google Meet, Zoom, etc.). Another advantage of E-therapy has been the increasing access outside of working hours to disadvantaged populations, physically disabled people, incarcerated people, single parents caring for infants, the elderly or people who live alone, isolated or want to maintain contact in case patients who move (McCarty and Clancy, 2002; Reamer, 2013, 2015; Harris and Birnbaum, 2015, in Cwikel, J., Friedmann, E., 2020).

But to offer E-therapy or social counseling services online, you need the service beneficiaries or patients to have the necessary skills and abilities and to own the technology, which would still involve a number of costs. Even if we only see advantages in the use of E-therapy, we cannot ignore the disadvantages that could arise through the alienation and disconnection between individuals, already existing and the lack of socialization or interpersonal relationships, an aspect highlighted since 2001 by the Clinical Social Work Federation (CSWF).

An innovative and creative solution for using ICT in social work practice was developed by social work practitioners from the Beijing Zhong Qing Social Work Development Center (BZQ) and researchers from the Faculty of Social Work during the pandemic in the city Beijing (Wang, Y., Gao, Q., Cheng, Z., Zhang, J., Wu, Y., 2021). Because the period of isolation and social distancing was prolonged, specialists had to develop a series of intervention of methods in crisis situations, because more and more families remained stuck at home, which led to the intensification of feelings of fear and isolation, anxiety, depression. BZQ created "Balcony Garden," an Internet-based intervention that strengthened family resilience and cohesion by creating an online, interactive, mutually supportive community, with some participants reporting that those activities were the most relaxing moments of the day. Creative use of online platforms (public WeChat accounts) by social workers enabled risk identification and case tracking, building trust and increasing self-esteem of single people and vulnerable families. At the same time, social workers who had rich experience in working directly with groups, realized that for a specific intervention, they needed knowledge and adaptation for these activities on online platforms.

Another vulnerable group that experienced high levels of stress during the epidemic was that of parents with children with autism spectrum disorders, as they had limited access to schools, community social work services and/or therapeutic services. They used technology to maintain connections with other parents, with therapists in their own homes because they can experience feelings of isolation and existential crises when they cannot do these things. There has been a collective decline in mental health, fatigue in online dating, conflicting views on accessing services during pandemic periods (Southey, S., Morris, R., Saini, M., 2021). Adaptability to changing circumstances and communication, revision of therapeutic plans and alliances, continuous use of technology in practice through telehealth services, can be ways to reduce the obstacles that appear in times of crisis for this category of beneficiaries. Therefore, families, communities and social care systems need to continuously review practical approaches and adapt to a constantly changing society. In Japan, for example, a new term has emerged in family

social work and family therapy: "Corona Divorce" because Asia-Pacific countries have experienced a high rate during COVID-19 (Lee, W.- Y. 2020, p. 1019). At the opposite pole, there were more fortunate families, for whom the pandemic period offered them "a much-needed opportunity for them to renew their intimacy. We believe many more babies will be conceived during this period, resulting in a generation of "COVID-19 baby boomers" in Asia. Childbirth statistics will later confirm whether this is the case" (p. 1021).

Professionals of social service faced challenges they had never experienced before and needed support to continue their emergency work with older people and their families who were experiencing isolation and dependency care services, community resources. The dilemmas and challenges of social intervention in working with older people have been accentuated by the pandemic, which has created new inequalities. But social workers have met the challenges and demonstrated their ability to protect themselves and older people and their families (Carvalho, M. I., Teles, H., Ribeirinho, C., & Marques, E., 2022). The use of information and communication technologies allowed social workers to communicate with the older people and their families through the 'guarantee of daily phone calls, service delivery door, virtual health visits, and telephone education and prevention and news updates have become part of the practice of social work' (Berg-Weger and Morley, 2020: 456, in Carvalho, M. I., Teles, H., Ribeirinho, C., & Marques, E., 2022).

3. THE SOCIAL BENEFITS OF E-LEARNING

The use of information and communication technologies (ICT) in learning strategies (E-learning) facilitates access to education, to continuous training of adults, professionals and also beneficiaries of social services.

Students can obtain bachelor's, master's degrees in various fields through educational platforms. E-learning as a process involves learning through computers, communication technology, online learning, but also the use of other tools that do not necessarily require access to the Internet (CDROMs and DVDs).

We can include several types of "learning" in the concept of E-learning: flexible learning, distance learning, open learning, Internet-based learning, networked learning. But the web has offered a new perspective on the transmission and exchange of information, offering new learning opportunities and alternative forms of education to the classic, face-to-face model. Pandey N, 2013, in the paper Social Benefits of E-Learning, presents a number of advantages of E-learning for learners, organization or community. Among the attributes of E-learning, the author mentions the opportunity to have new and different students, the reduction of costs, the exploration and testing of new ideas, the combination of multimedia training methods and instructional design or personalized learning. E-learning allows learners to be in control, which the classic classroom learning model does not. At the same time, there may be flexible learning programs or continuous access to online educational resources to acquire the necessary knowledge. In other words, E-learning can lead to excellent results, with low costs, including for the environment. For example, a UK study found that delivering distance education courses consumes much less energy, on average 90% less energy and produces very low carbon dioxide emissions, compared to the classic model of education. But a big challenge remains: course management and access to resources. The opportunity offered by the emergence and development of E-learning has allowed individualized training, and depending on the assessment of needs, it can target specific needs, it can lead to its own pace of synchronous electronic learning. Thus, a great benefit that E-learning offers is a maximum number of participants, with different learning styles and needs.

But regardless of the benefits of E-Learning and the clear orientation towards these methods, computers will not eliminate human interaction, empathy and emotional support. The theory of collaborative learning claims that human interaction can lead to significant results in the learning process, the teacher-student relationship being very important. These aspects were taken into account in the use of technologies that supplement these aspects in the E-learning process, for example, message boards, chats, e-mail and teleconferences, discussion forums. There may also be a number of disadvantages for learners, especially for those who have passed their prime, older people, technological problems, fear of technology (technophobia) or the fact that they do not have the right technology for learning, little social interaction or some barriers cultural. In the E-learning process, the possibilities of communication and transmission of information are reduced, body language is missing and peer-to-peer learning is eliminated. Investments in technology, additional technological expenses regarding the achievement of the compatibility of all software and hardware, can be disadvantages both for the learners and for the supplying organization.

A study conducted in the United Arab Emirates Al Rawashdeh, A. Z., Mohammed E., Y., et al. (2021), identified a number of advantages and disadvantages of E-learning in university education: offering scientific material in an interesting way and the possibility of communication and contact between students and between students and the

teacher, being the most important advantages, but these are reflected at the expense of time spent with colleagues, of direct face-to-face communication with others, because they have to spend more time on social media accounts, in front of technical means. The Moodle learning platform is an effective E-learning tool, being easy to use due to the variety of available options, modular design, increased user authentication options, easy installation. Another advantage relates to flexibility, which allows it to be used in any teaching activity, any style or mode of environment (p. 109). The system is easy to use, "effective in managing time, provide ease in the management of courses, teachers, facilities, generate reports. It further provides timely reminder to users which includes; dates of deliveries, answering questions, test dates etc." (p. 109). However, students indicated a presence of electronic illiteracy among parents, which reduces their ability to interact digitally with their children (70% of students). So, it is important to know both the advantages and disadvantages of E-learning because they can influence the overall performance as students.

A series of studies have highlighted the advantages or disadvantages of E-learning (Mukhtar K, Javed K, Arooj M, Sethi A., 2020), Chi Zhang C., Zheng G., 2014, Luján-Mora S., 2006), but are the results and performance of students/learners the same as in classical education? A number of researches have been carried out that have attempted to identify the existence of differences in academic success between classroom and distance learning and to evaluate those characteristics associated with lower results in distance learning (Harel-Gadassi A., 2022).Distance learning is considered to offer flexible learning opportunities, especially for adult students, "non-traditional learners", a very large group of learners over the age of 25 who believe they need further training or are for the first time given to students, compared to only 16% traditional students, aged between 18-22 years, as shown by some studies in the USA (Chi Zhang C., Zheng G, 2014). The benefits of distance education are recognized: the reduction of physical distances and flexible access to education for those learners who are geographically far from an academic institution or lower costs, but do not develop the socialization and interpersonal skills that would appear in traditional learning systems. Also for learners opting for distance education it would be more difficult to manage those situations that would require additional explanations from teachers, who receive less support in less interactive environments. The conclusion was that there are students for whom distance learning is suitable, self-efficacy and intrinsic motivation leading to performance, while for others who fail to meet academic requirements, the system is demotivating and leads to frustration.

But the COVID-19 pandemic has had unwanted and unexpected effects on all education systems, with teachers switching from the classic, face-to-face form to distance education in just a few days, being forced by the medical and legislative context to adapt their courses to the online environment, against a background of high emotionality, linked to uncertainty regarding the future.

4. E-LEARNING AND CONTINUOUS TRAINING OF ADULTS

Analyzing the variety of learning theories, we must highlight the differentiating aspects between adult and child learning in that adult learners are more self-directed, have prior experience and are internally motivated to learn subjects that are more relevant to life and can be immediately applied. Adult learning theories emphasize the importance of experience and self-direction and imply that adult learners benefit most from experiential constructivist learning environments.

Social pedagogy can make an important contribution by adapting the adult's pedagogical learning methods to the new information and communication technologies. Adult education highlights the specifics and ways of approaching the process taking into account the characteristics of this age group, replacing the pedagogical model with the andragogic one. Andragogy, according to the specialists' definition, represents "the art and science of helping adults learn", "a comprehensive theory of adult education and training" (Knowles, 1984). The design of learning programs for adults must first start with the presentation of the advantages of using technology, of accessibility in accessing some social goods and services, medical. In the opinion of the same author, the andragogic model differs from the pedagogical model, “andragogy is premised on at least these four crucial assumption about the characteristic of learners…..1) the self-concepts moves from on of being a dependent personality toward being a self-directed human being; 2) they accumulate a growing reservoir of experience that becomes an increasingly rich resource for learning; 3) their readiness to learn becomes oriented increasingly to the developmental tasks of their social roles; 4) their times perspectives changes from on postponed application of knowledge to immediacy of application” (Knowles, M.S., 1980, p.44-45).

The strategies used in adult education differ from those used in child education, because adults learn from their own experience, they must have the reason for learning: why should they?, what do they use their new knowledge

for. 2. Adults want to be considered by the trainer as responsible, competent persons and must be helped to self-direct themselves in the learning process. 3.Experiences (positive but also negative) can represent starting points in individualizing and personalizing learning strategies because adults have different motivations and learning styles. 4. Adults will learn the knowledge they need in concrete life situations. The psychological availability for learning is given by the combination of aspects of personal, professional and social life. Thus, we have on the one hand the development of the personality and on the other hand the career (career promotion) and the acquisition of a higher social status. 5. Adults focus on accumulating knowledge that helps them solve personal, social or professional problems, the process being directed by self-realization. 6. The motivation of learning in adults is different from that of children, being predominantly intrinsic, having as reasons career advancement, better jobs or self-realization (Knowles, 1984; Nistor Gh, 2014).

5. CONCLUSIONS

The realization of E-learning programs for the acquisition of computer skills by adults must take into account the characteristics of age, physical factors (motor, physical health), psychological, social (the existence of a formal or informal support network).

For about 2 1/2 years we have been dealing with the COVID-19 pandemic and we don't know yet if it is over...which means we have to face the challenges together with the family becoming our base for this battle. The way the family worked, the way of interaction and relationship of its members, was influenced by social isolation, physical or psychological distance. The family was a refuge, but also a place of struggle or trauma, a support base for all specialist interventions.

Physical or digital communication, must be part of the strategy of professionals to be pro-active and reach out to those in difficulty and solve problems together (O'Leary, P., Tsui, M. (2021).

As social work educators, we are forced to find creative solutions, to adapt technology to meet our pedagogical goals, to continue the process of distance social work education (Wallengren-Lynch M., Dominelli L., Cuadra C., 2021).

Finally, social work educators, as resources of professional knowledge, skills, attitudes, are obliged from a professional point of view, to share and disseminate to students and/or trainees, research results to find answers and effective strategies for practice social work, in their work with beneficiaries.

References

[1] Al Rawashdeh, A. Z., Mohammed E., Y., et al. (2021), Advantages and Disadvantages of Using e-Learning in University Education: Analyzing Students' Perspectives. The Electronic Journal of e-Learning, 19(2), pp. 107-117, ISSN 1479-4403, available online at www.ejel.org.

[2] Amadasun, S. (2020). Social work and COVID-19 pandemic: An action call. International Social Work, 63(6), 753–756. https://doi.org/10.1177/0020872820959357.

[3] Budeva S. (2022), Opportunities and Problems Facing Online Social Work in a Pandemic. Revista de Asistență Socială, 2022/ 2, ww.swreview.ro.

[4] Carvalho, M. I., Teles, H., Ribeirinho, C., & Marques, E. (2022). Challenges for social work with older people in the first COVID-19 pandemic state of emergency in Portugal. International Social Work. https://doi.org/10.1177/00208728211058775.

[5] Cwikel, J., & Friedmann, E. (2020). E-therapy and social work practice: Benefits, barriers, and training. International Social Work, 63(6), 730–745. https://doi.org/10.1177/0020872819847747.

[6] Harel-Gadassi A. (2022). For Whom is Distance Learning Suitable? The Relationship between Distance Learning, Executive Functions, and Academic Achievements. Universal Journal of Educational Research, 10(2), 129-136. DOI: 10.13189/ujer.2022.100202.

[7] Knowles, M.S.(1980), The modern practice of adult education. From pedagogy to andragogy, Revised and update, Cambridge Adult Education, Prentice Hall Regents, Englewood Cliffs (Chapter 4), https://www.umsl.edu/~henschkej/articles/a_The_%20Modern_Practice_of_Adult_Education.pdf.

[8] Lee, W.Y. (2020) 'The Musings of a Family Therapist in Asia When COVID-19 Struck', Family Process, 59(3): 1018–1023.

[9] Leone S. (ed.) (2014), Synergic integration of formal and informal e-learning environments for adult lifelong learners; Chapter 1, Chi Zhang C., Zheng G.: Profiling and Supporting Adult Learners, USA; IGI Global, DOI: 10.4018/978-1-4666-4655-1.ch001.

[10] Luján-Mora S. (2006), A Survey of Use of Weblogs in Educations. Conference: International Conference on Multimedia and Information and Communication Technologies in Education. Current Developments in Technology-Assisted Education, Available from: https://www.researchgate.net/publication/236858882_A_Survey_of_Use_of_Weblogs_in_Education

[11] Mukhtar K, Javed K, Arooj M, Sethi A. (2020), Advantages, Limitations and Recommendations for online learning during COVID-19 pandemic era. Pak J Med Sci May-2020, Vol. 36 No. COVID19-S4: COVID19-S27-S31. doi: https://doi.org/10.12669/pjms.36.COVID19-S4.2785.
[12] Nistor, Gh. (2014), New Educational Strategies regarding Quality of Life for Elderly People, in Procedia - Social and Behavioral Sciences, Elsevier, 2014, vol.142, pp. 487-492, ISSN- 1877-0428, doi:10.1016/j.sbspro.2014.07.653, Indexat Science Direct, CrossMark, DOI, Procedia Social and Behavioral Science, Elsevier.
[13] O'Leary, P., & Tsui, M. (2021). Social work with families in the pandemic of COVID-19: Ten challenges facing families. International Social Work, 64(6), 835–836. https://doi.org/10.1177/00208728211051293.
[14] Pandey, N. (2013), Social Benefits of E-Learning. KDK College, Journal Jan 2013, ISBN-978-93-5097-174-1, Available at SSRN: https://ssrn.com/abstract=2290626.
[15] Peláez A. L. (2021), News from our societies – International Council on Social Welfare (ICSW): Building a better world. International Social Work, 64(3), 454–455. https://doi.org/10.1177/00208728211009387.
[16] Peláez, A. L. (2022). News from our societies – International Council on Social Welfare: Beyond the pandemic:Challenges for social welfare. International Social Work, 65(3), 568–570. https://doi.org/10.1177/00208728221090819.
[17] Southey, S., Morris, R., & Saini, M. (2021). Coparenting autistic children during COVID-19: Emerging insights from practice. International Social Work, 64(5), 790–795. https://doi.org/10.1177/00208728211013881.
[18] Wang, Y., Gao, Q., Cheng, Z., Zhang, J., & Wu, Y. (2021). Creating solace and hope during COVID-19: An innovative Internet-based social work intervention. International Social Work, 64(2), 251–254. https://doi.org/10.1177/0020872820959379.
[19] Wallengren-Lynch M., Dominelli L., Cuadra C. (2021), Working and learning from home during COVID-19: International experiences among social work educators and students, International Social Work Journal, 1–14, 2021, DOI: 10.1177/00208728211051412.
[20] ***UE, Agenda digitală pentru Europa, Digital Agenda for Europe, https://www.europarl.europa.eu/factsheets/ro/sheet/64/digital-agenda-for-europe.
[21] **** COMISIA EUROPEANĂ, 2020, CARTE ALBĂ. Inteligența artificială - O abordare europeană axată pe excelență și încredere, EUROPEAN COMMISSION, 2020, WHITE PAPER. Artificial Intelligence - A European approach focused on excellence and trust , https://ec.europa.eu/info/sites/default/files/commission-white-paper-artificial-intelligence-feb2020_ro.pdf.

Characteristics of Ubiquitous Learning Model and Investigation of its Applicability in Language Education

Fethi KAYALAR[a*]

[a] *Assoc. Prof. Dr., (Erzincan B. Y. University), Faculty of Education,, Erzincan, TURKEY*
fkayalar@erzincan.edu.tr

Abstract

The revolution in the field of communication and information technology has led to the spread of educational environments where university students can receive information. Integration of mobile phones for learning is being widely adopted for language teaching in many schools. The term “Mobile learning” or m-learning, which has been widely used recently, is defined as a type of what can be done with the use of mobile technologies. The "Ubiquitous Learning”, developed within the mobile learning model, is a new form of learning that allows learners to access learning materials anywhere and anytime via wireless network and Internet. In our study, it is aimed to investigate the applicability of the Ubiquitous Learning Model (Learning Everywhere Model) in Language Teaching. In the reviewed literature, it has been determined that this learning model has a feature that facilitates learning in every environment, especially with the development of mobile technologies in recent years, and it is an extremely useful learning model in language education, especially in every stage of Higher Education. It has been understood that the Ubiquitous Learning Model, which is realized with the help of mobile devices, is more efficient and applicable than other models in achieving academic success of foreign language education students.

Keywords: Ubiquitous Learning Model, Language Education, Mobile Learning, Education Management

1. INTRODUCTION

Are we aware of how much technology is needed in education in an age where learning takes place anytime and anywhere? Today, the epidemic has accelerated this process. However, despite the fact that the use of technology in educational contexts has more than a century of history, we are still reluctant to use it. We call for a transformation in schools that includes not only technological but also educational pedagogy. Access to information no longer depends on schools alone. Students can search and find information easily, but may face difficulties in choosing the right one and analyzing it correctly.

In this brand new educational process, the role of the teacher has radically changed and gained new features. But getting used to the current reality is not an easy task. Therefore, teacher training is important in helping teachers adapt to new types of learners and guiding them on how to use the latest technology. Recently, it is a fact that the use of Emergency Distance Education and digital technologies has suddenly become a “New World” for the education system. While this change was more natural for some teachers, for others this situation created the necessity to make a quick transition, which brought difficulties and mistakes. Based on the assumption that face-to-face and digital education are opposite sides of a war, digital education has recently been portrayed as a boogeyman. This is highly misleading, as both environments can serve as the basis for improving education. The fact that many teachers, parents and students have critically reflected on their experiences with Emergency Distance Learning, due to the lack of resources (such as computers or internet connection) and pedagogical and technical preparation suitable for the digital environment, may have caused a loss of confidence in the new order.

* Corresponding author.

The truth is that neither the school nor the world was prepared for such an epidemic. In the emergency, the teachers tried their best to avoid disruption of school education. For all these reasons, continuing to refer to any type of online education as Emergency Distance Learning can be misleading as this will be perceived as a negative phenomenon. The challenge now is to rethink the school environment by trying to combine digital and face-to-face learning environments (Hybrid Learning Models). We know that many teachers put this into practice with their students and create pedagogical scenarios that are not copies of "analogue" scenarios. Students are encouraged to search and select information, watch and analyze videos, systematize content, and produce resources that aggregate what they have learned.

Collaboration has been crucial in overcoming individual isolation and helping teachers continue their professional development. Networked learning, which many teachers have experienced, has been beneficial as it allows them to build relationships online with colleagues from various parts of the country, thereby creating learning networks for professional development. The use of digital technologies in learning complements the knowledge development of students. They serve to support the development of classroom dynamics and informal learning, which add tremendous value to the learning process. In this context, one of the biggest challenges faced by the education system is the design of new pedagogical learning environments. It is time to think about pedagogical models that rethink the role of the teacher: what, why, and how they teach in what areas, using what resources.

We know that students have a keen interest in mobile technologies and use them daily to communicate, research, play games or make social connections. Accordingly, there is a possibility to improve learning outcomes by using pedagogical, technological, convergent, portable, multimedia and interactive resources through mobile technologies among educational resources. New media is changing education and training. It not only opens access to information, but also provides content in various formats (text, image, audio, video) using different forms of communication. Educational strategies should encourage the involvement of the various senses: imagination, intuition, cooperation and emotional impact. Formats such as images, videos, music (multimedia resources) can facilitate the learning process and provide learners with interactive experiences by connecting senses, emotions and logic. In this way, students can become active members. Its effectiveness is deeply linked to the way students engage in research, interact with their knowledge, and seek new ways to express it.

The most widely used hybrid model is Flipped learning, which combines face-to-face and virtual training for greater efficiency. Students have the opportunity to study online (at home or at school) and discuss what they have learned in class, either individually or in groups. Face-to-face activities can be carried out in different ways such as discussions, elaboration of projects, research. This model makes the learning process more meaningful by involving students in the production of learning outcomes.

Hybrid models should be planned considering the diversity of each student's in-school and out-of-school access conditions. Teachers should design different activities for those who have partial or regular access to digital technologies with little or no access: before class (individual study), during class (face-to-face or online group activities) and after school (monitoring and assessment). The biggest challenge for the school today is to transform the traditional teacher-student relationship into an active and more participatory model. This is a complex process that will take time.

It is inevitable that there will be a relationship between mobile technologies and learning in today's world where information is produced very quickly, being able to access and to apply information quickly to the learning process gains importance, and the internet and mobile technologies can provide instant access to global information (Sharples, Taylor, & Vavoula, 2007). The world of the twenty-first century has been intensely exposed to technological developments and has undergone a transformation in the field of education, as in many other fields, depending on technological developments. These developments in the field of informatics have resulted in the frequent use of e-learning systems in traditional and distance learning environments. The use of mobile devices in educational applications after computers has made it possible to design lessons in which real world and digital world resources are used together, and mobile learning (m-learning) applications have taken their place in today's understanding of education. Although it is still an evolving field of research and practice, many questions remain unanswered and a critical assessment of continuous learning is needed. For example, how can uninterrupted learning be theorized from psychological and cognitive development and sociocultural perspectives? Should interruptions in learning always be fuzzy or transitive? How can mobile devices and ubiquitous/cloud computing platforms be combined to support truly anytime, anywhere seamless learning? How can advanced technological possibilities inform researchers, teachers, and students to facilitate or conduct uninterrupted learning processes? How can we change students' (and teachers') epistemological beliefs to create favourable conditions for nurturing habits and skills of mind for ubiquitous learning practice? What are the critical success factors and challenges in teaching and disseminating ubiquitous learning practice in various formal or informal educational contexts?

In the light of these questions, the aim of this study is to produce a conclusion by combining interpretations, visions and past research and practices on Ubiquitous Learning from different perspectives, rather than repeating the current state of lifelong learning or mobile learning arts.

2. UBIQUITOUS LEARNING

Learning anywhere involves placing students in an environment that encourages constant stimulation through visualization and comprehension techniques. These environments are generally designed in such a way that each student can learn at their own level and pace. In theory, this helps every student learn faster and retain knowledge more easily. The ubiquitous learning environments contain highly advanced interactive technology, but this type of learning can also be done in a technology-free zone. Teachers in ubiquitous learning centers often play a very different role than the teacher in a traditional classroom.

An environment that encourages this type of learning typically helps students engage themselves in the learning process with little direction. Students interact with learning stations to ensure understanding of key concepts. When done right, students may not even realize that they are continuing to learn. The ubiquitous learning techniques not only help students learn at their own pace, but also try to mix topics. Math, science, language, history, music and art are often intertwined to create a total learning experience.

A ubiquitous learning classroom can contain four or five interactive learning stations. Each student may be given a small wireless computer tablet that tracks their progress. The student logs into the learning programs at each station with a password and uses the tablet to interact with the lessons available there. While the student is working, the learning pace and style are analyzed, recorded and transferred to other stations. Once the student moves on to the next station, the idea is that the lesson should be tailored to that student's skill level. That way, students of many skill levels can all share the same class.

The term learning-anywhere also refers to holistically designed lesson plans. For example, a student at a history station may be learning about the Renaissance. When moved to the art or music station, that station will likely contain lectures on Renaissance art and music. The same is true for language, math and science classes - the student will learn what breakthroughs researchers made during that period. In this way, students not only learn concepts, but also understand how, where and why such things arise.

Understanding the 'why' is also a very important part of this type of learning. Even in a technology-free environment, students can learn this way to improve their understanding. For example, in a non-technological ubiquitous learning experience, the teacher might design activities to help them discover why seeds grow in some settings and not others. This probably involves experimentation, hypotheses, and lots of discussion. In any ubiquitous classroom, the teacher acts more like a guide than a leader, allowing students to work at their own pace and asking the teacher for clarification when needed.

2.1. History of Ubiquitous Learning

The development of technology is constantly increasing the speed and scope of communication. Portable technologies have enabled the Internet to exceed the limits of computers. The question of how the communication channels provided by portable technologies to each individual can be used effectively in the learning process reveals new methods. One of these methods is Ubiquitous (anywhere, anytime) learning.

Ubiquitous learning is based on the introduction of the concept of "Ubiquitous Computing" by Mark Weiser in the late 1980s (Zhang, 2008). Yano et al. stated that thanks to Ubiquitous Computing, computers-human interaction will take place in every moment of life, but these systems are embedded and people will not notice (Moushir M. El-Bishouty, 2010). Ubiquitous learning, in this aspect, is in constant interaction with the human being and aims to create a learning process according to his needs.

According to Graf and Kinshuk, ubiquitous learning emerged from the blending of mobile learning and non-formal learning (Graf & Kinshuk, 2008). Graf and Kinshuk stated that the portable features of mobile learning are strong but dependent on the internet for the learning process, while the portability of non-formal learning is weak but its integration with the learning process is better (Graf & Kinshuk, 2008). Yahya et al.(2009), on the other hand, state that learning progresses by evolution, e-learning turns into m(mobile)-learning, and m-learning turns into u(ubiquitous)-learning.

3. CHARACTERISTICS OF UBIQUITOUS LEARNING

According to Chen and Curtis and Saadiah Yahya, the characteristics of ubiquitous learning are (Chen Y. K., 2002; Curtis, 2002; Saadiah Yahya, 2010)

Persistence: Learners do not lose their work unless they delete it, and all learning processes are recorded every day.
Accessibility: Learners can access their documents from anywhere. The learner can access their documents whenever they want, so learning is individual.
Proximity: The learner can access any information quickly, so they can quickly solve the problem or save the question and answer it later.
Interactivity: Synchronous or asynchronous communication can interact with learning experts, teachers and friends. Thus, experts and information can be accessed more easily.
Situational teaching activities: Learning can be integrated into daily life. In the problems encountered, information can be seen in its natural form. Thus, learners realize the relationship between knowledge and actions.
Compatibility: The learner gets the right information in the right place in the right way.

Today, Web Based Learning (WBL) environments partially meet the characteristics of ubiquitous learning environments above. With the development of technology, WBL environments will gain the characteristics of ubiquitous learning environments in the future. For example, education carried out via portable devices today may be a transition to a more individual structure with technologies such as wearable computers and access to the internet from anywhere in the future.

The persistence criterion can be met in many WBL environments today. In the future, the learner information recorded in WBL environments can be analyzed and used in the decision-making phase of intelligent learning systems. Accessibility has always been known as one of the important features of WBL environments today. Ubiquitous learning environments are based on access to information at every moment of life. The learner should be able to access his documents and friends whenever he needs it from wherever he is. In this case, WBL should be in a structure that can be accessed and used more easily in the future.

Intimacy, the future learner will always feel that there is a learning environment available to them. He will be able to meet his learning needs at every moment of his life. In this case, it can be said that the weight of today's formal learning will shift towards informal learning.
Interactivity, WBL environments today provide interactivity with web 2.0 technologies. In the future, communication between individuals will be stronger as individuals will always be able to access the Internet. Cooperative learning environments will gain even more importance. Therefore, WBL environments in the future should effectively communicate between individuals.

Situational learning emphasizes that learning takes place in the context of social relations and real life. Ubiquitous learning that takes place in life has a structure that overlaps with learning with a situation. Since learning will take place in life, real problems may be encountered and the information needs to be applied in real life for the solution. In this respect, it can be thought that in the future WBL will have a structure that is more compatible with real life.

Factors such as adaptability, learner needs in the learning process, learning styles, and environment are called individual differences. The difference of ubiquitous learning from today's WBL is to collect more information about the learner and to provide appropriate learning for the learner. For example, factors such as the learner's pulse rate, time, temperature will gain importance in understanding the learner. In addition, the wishes of the learner are taken into consideration more in ubiquitous learning. For example, when accessing the learning environment from a device with a slow connection, low quality content may be provided, but the user may want to wait and have higher quality content, such individual needs are taken into account in ubiquitous learning.

4. CONCLUSION

We examined the state of modern language learning theories and found that they fit well with the general philosophy of 21st century learning, such as Ubiquitous Learning, which advocates nurturing students who can positively direct their learning and collaborate with others. We found that ubiquitous and cloud computing technologies can mediate and support the assimilation of learning into students' daily life. However, we have come to the conclusion that it is equally important to incorporate subject-specific learning theories into developing learning models that will provide concrete methodology to ensure in-depth learning of relevant knowledge and skills, rather than just using general, subject-independent learning concepts to guide the Second Language Learning design (Kayalar, 2022). A common limitation of previous word-focused Mobile Assisted Language Learning studies is that

they rarely go beyond behavioral or contextual learning. The Second Language Learning framework proposed within the scope of Ubiquitous Learning aims to overcome this limitation. Informed by psycholinguistics, we are of course aware of the importance of making it easier for students to create their mental dictionaries, especially for second language learning. Therefore, we propose to consider mental lexicon-related learning activities to help students synthesize their vocabulary learning, while limiting the similar prior learning design that ignores the contextualized stage by taking advantage of the possibilities of ubiquitous technology.

Indeed, Second Language Learning with a Ubiquitous Learning Model emphasizes closing loops in both the seamless learning dimension to develop 21st century knowledge and skills through the ubiquitous technology-mediated continuous learning process, and the domain-specific language learning dimension to nurture holistic language competences.

References

[1] Chen, Y. K. (2002). A Mobile Scaffolding-Aid-Based Bird – Watching Learning System. Proceedings of IEEE International Workshop on Wireless and Mobile Technologies in Education (s. 15-22). New York: IEEE Computer Society Press.
[2] Curtis, M. L. (2002). Handheld Use in K-12: A Descriptive Account. Proceedings of IEEE International Workshop on Wireless and Mobile Technologies in Education (s. 23-30). New York: IEEE Computer Society Press.
[3] Graf, S., & Kinshuk. (2008). Adaptivity and Personalization in Ubiquitous Learning Systems.
[4] Kayalar, F. (2022). Seamless Learning in Language Education: Work of Recent Pandemic. Proceedings of IAC 2022 in Prague.
[5] Moushir M. El-Bishouty, H. O. (2010). Social Knowledge Awareness Map for Computer Supported Ubiquitous Learning Environment. Educational Technology & Society, 27-37.
[6] Saadiah Yahya, E. A. (2010). The definition and characteristics of ubiquitous learning: A discussion. International Journal of Education and Development using Information and Communication Technology.
[7] Saadiah Yahya, Noor Habibah Arshad & Nor Zaila Wahab (2009). e-Education systems implementation success model. International Journal of Education and Development using Information and Communication Technology (IJEDICT), 2009, Vol. 5, Issue 2, pp. 123-133.
[8] Sharples, M., Taylor, J., & Vavoula, G. (2007) A Theory of learning for the mobile age. In R. Andrews and C. Haythornthwaite (eds.) The Sage Handbook of Elearning Research (pp. 221-247). London: Sage.
[9] Zhang, J.-P. (2008). Hybrid Learning and Ubiquitous Learning. First International Conference, ICHL. Honk Kong.

Engineering, Transport, IT and Artificial Intelligence (IAC-ETITAI 2022)

IoT Market Analysis and Maturity Assessment: A Case of Bahrain and KSA

Humam ELAGHA[a*]

[a] *Centre for General Studies, Royal University for Women, Riffa, Kingdom of Bahrain, Email: halagha@ruw.edu.bh*

Abstract

The Internet of Things (IoT) is one of the most prominent tech trends to have emerged in recent years. The growing adoption of IoT technology across end-user industries, such as manufacturing, automotive, engineering, procurement, and healthcare, is driving the market's growth positively. With the traditional manufacturing sector amid a digital transformation, the IoT is fueling the next industrial revolution of intelligent connectivity. This is changing the way industries approach increasingly complex processes of systems and machines to improve efficiency and reduce downtime. This study explores the current IoT market dynamics and growth opportunities in Bahrain and KSA. Furthermore, this study assesses and analyses the IoT market trends, maturity, demand, and forecasts in Bahrain and KSA.

Keywords: Internet of Things, market trends, demand

1. INTRODUCTION

The Internet of Things (IoT) technology is the keystone for various organizations to digitally transform, thus, empowering them to upgrade the existing processes by creating and tracking new business models. Enterprises and service providers have been looking at IoT as the key enabler to augment digital transformation and to unlock operational efficiencies [1].

Industry 4.0 and IoT are at the Centre of new technological approaches for development, production, and management of the entire logistics chain [2].

The Internet of Things revolution will dramatically alter manufacturing, energy, agriculture, transportation and other industrial sectors of the economy which, together, account for nearly two-thirds of the global gross domestic product (GDP) [3], [4].

The purpose of this study is to:

- Investigate the current market dynamics and growth opportunities in Bahrain and KSA.
- Assess IoT Market Trends and Maturity in Bahrain and KSA.
- Assess IoT demand from employers and professionals to verify current and future market needs in Bahrain and KSA.
- Assess the impact of rapid technological ecosystem developments in the IoT Market.

* Corresponding author.

- Analyse industry key players' forecast of IoT market future trends.
- Discuss the research findings and its implications for practitioners and academia.

2. INTERNET OF THINGS OVERVIEW

2.1. Market Definition of the Internet of Things

The Internet of Things (IoT) describes the network of physical objects "things" with sensors, sending data via processors to gateways to be analyzed by software applications to make data driven decisions [5].
Core Components of IoT include Sensors connect the "things", Processors process the data collected by the "things", cloud-based applications to analyze the data for effective decision making, Gateways route the processed data to software application [6].

2.2. Key Insights

The IoT market is still evolving and exists as part of an emerging technology ecosystem with big data and analytics and cloud. The devices in IoT are heterogeneous as based on different hardware platforms and networks [7]. As IoT becomes more widespread in the marketplace, companies are capitalizing on the business value it can offer IoT can allow businesses to derive data-driven insights from IoT data to make informed decisions [8], [9].

2.3. IoT Top Sector Applications Globally

In the next 10 years, the Internet of Things revolution will dramatically alter manufacturing, energy, agriculture, transportation and other industrial sectors of the economy [10], [11] which, together, account for nearly two-thirds of the global gross domestic product (GDP) (World Economic Forum).
Top sectors in which IoT is applied include manufacturing, logistics, energy and government.
Manufacturing: IoT is applied to the manufacturing sector for enterprise asset management which involves asset maintenance, planning and scheduling by utilizing data from various "things" in the production facility to make data driven decisions.

Logistics: IoT is applied to the logistics sector for fleet tracking systems which providesreal-time data on the entire fleet of vehicles which enable effective optimization of assets and cost reduction.
Energy: IoT is applied to the energy sector by creating smart refineries and petrochemical facilities as well as upstream assets through data driven optimization and decision making.
Government: IoT is applied to the government sector mainly via the emergence of smart city initiatives which aim to harness the power of IoT for improved services to citizens.

3. APPROACH

This research adopted a tailored approach to assess IoT market trends and maturity in Bahrain and KSA:

1. Identified Relevant Sectors
   - Identify the relevant sectors.
2. Assessed Market Trends and Maturity
   - Provide global, regional and local trends per relevant sector.
   - Determine the market maturity per sectorial skill need.
3. Demand Analysis
   - Primary research was completed to assess market needs.
   - Employer In-Depth Interviews: Assess demand from employers to verify current and future market needs.
   - Professional In-Depth Interviews: Assessing the demand from professionals.
4. Critical Success Factors
5. Key Recommendations

6. MARKET ANALYSIS

In this section, the research paper assesses market trends and determines the market maturity per sector in KSA and Bahrain.

3.1. Market Card: KSA

3.1.1. Market Readiness

Based on KSA Ministry of Economy & Planning, Saudi Arabia Monetary Fund, the figure below (figure 1) presents the Market Card of Saudi Arabia and Market Readiness.

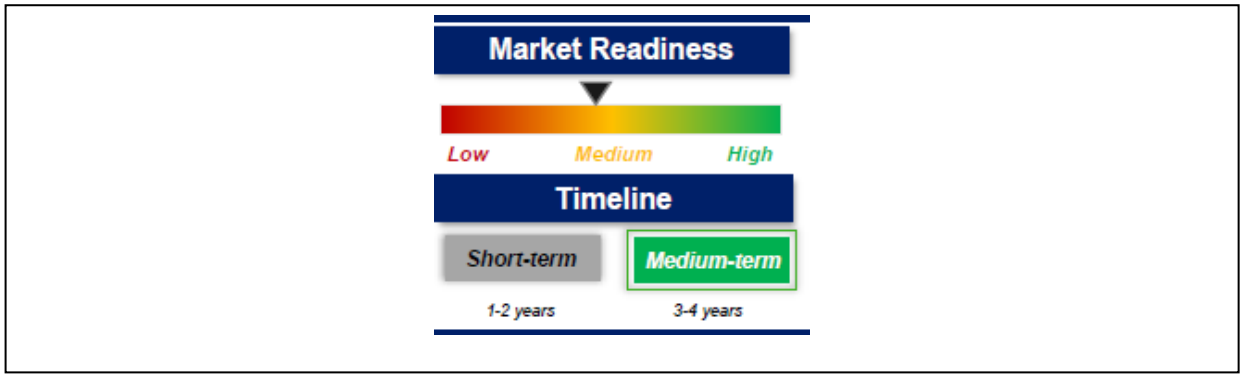


Fig. 1. KSA market readiness

3.1.2. Sector Analysis

Figure 2 presents the Sector Growth and Employment Growth per sector in KSA.

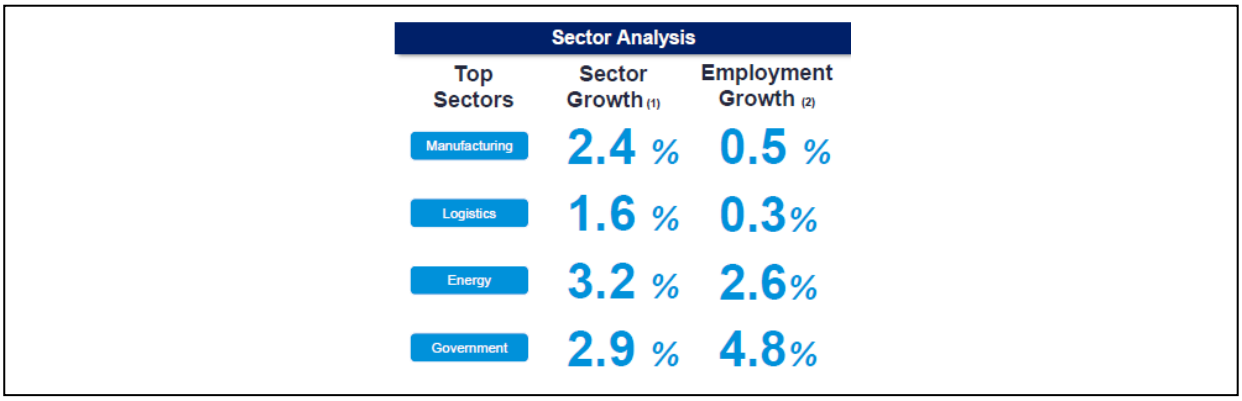


Fig. 2. KSA sector analysis

3.1.3. Key Insights

- KSA is the largest IT market in the GCC with a market size of 1.48 Billion USD.
- The IoT market in KSA is projected to rise by 19.5% up to 2023 due to government projects and private companies capitalizing on IoT gains.
- Mobily STC offers a IoT solution to public agencies and private companies in KSA to leverage their IoT platform for optimization.

3.1.4. Overview & Initiatives

- IT spending in KSA reached USD 1.48 B in 2019 –rising at a CAGR of 19.5% between 2018-2023
- KSA is the largest IT market in the GCC.
- Government's mega-projects, new regulations, and nationwide access to low-cost, reliable connectivity are helping drive IoT adoptions.
- The Saudi Data and AI Authority (SDAIA) government national data and AI strategy aims to train more than 20,000 data and AI experts by 2030, in which IoT talent would be included.
- NEOM Mega City to use IoT: NEOM's aim is to be the first city in the world to host hyper-connected cognitive city and will use IoT sensor technology to connect the entire city.
- STC provides IoT Solution: Saudi telecommunications company (STC) subsidiary "Solutions by STC" provides a range of technology solutions with includes IoT to public and private players.

3.2. Market Card: Bahrain

3.2.1. Market Readiness

Based on Bahrain Ministry of Finance and National Economy, the figure below (figure 3) presents the Market Card of Bahrain and Market Readiness.

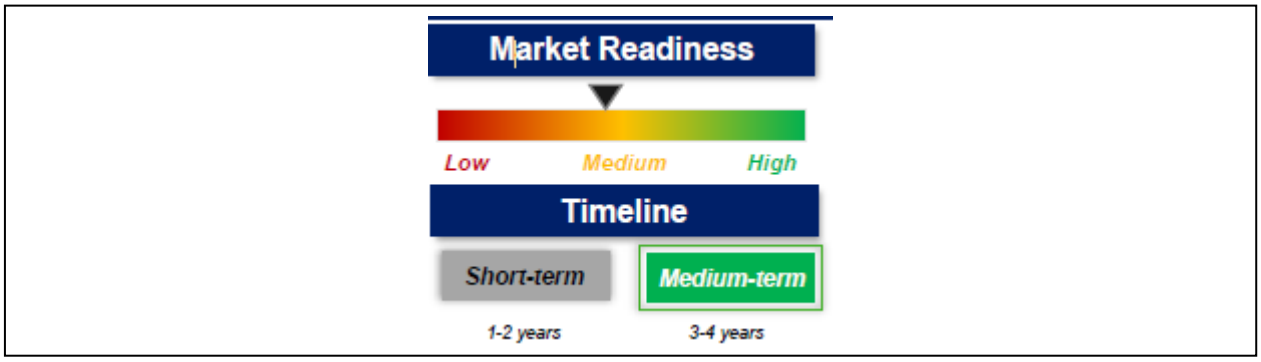


Fig. 3. Bahrain market readiness

3.2.2. Sector Analysis

Figure 4 presents the Sector Growth and Employment Growth per sector in Bahrain.

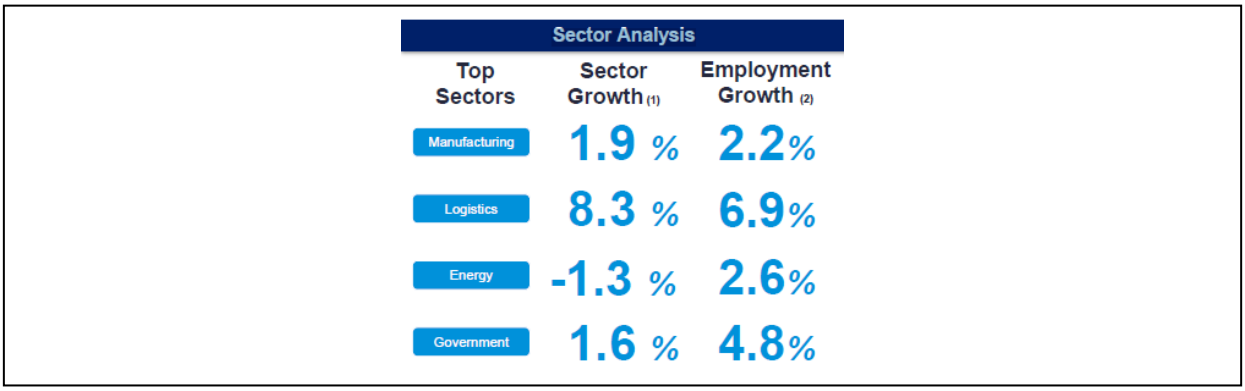


Fig. 4. Bahrain sector analysis

3.2.3. Key Insights

- The government is focused on making Bahrain a regional hub of Industry 4.0 and IoT as a key technology enabler.
- AWS provides a cloud IoT solution while private companies are launching IoT initiatives.
- Key sectors in which IoT is applied are on the rise in Bahrain for both sectorial and employment growth.

3.2.4. Overview & Initiatives

Bahrain ranks 1st in the Arab region in information and communications technology Development

- Index (IDI) as per International Telecommunication Union (ITU) report
- The IGA has provided government entities with the required frequency bands that will contribute to the Kingdom's Digital Transformation journey and support achieving 2030 Kingdom's vision for smart cities, IoT & Machine-to-Machine (M2M) communication.
- BFG using IoT for Industry 4.0: BFG International launched an industrial automation pilot program with EDB and Tamkeen using IoT and advanced software.
- AWS IoT Solution: AWS in Bahrain provides an IoT solution for industrials, consumer and commercial solutions via the cloud.
- Regional hub of Industry 4.0: The Bahrain EDB is investing in ICT and working with Tamkeen and private companies to establish Bahrain as a regional hub of Industry 4.0 solutions, which includes IoT as a key feature.

4. EMPLOYER DEMAND

Key themes have emerged from interview with In-Depth Interviews with Employers including Software AG: Software & Technology Services and Solutions, Hewlett-Packard Development Company, OIVAN (Digital Force For Good), Thakaa Center, and AlSharif Group Holding.

4.1. Low demand but expected to grow

- Currently there is low demand from employers for IoT as the technology entered KSA 2-3 years ago and the technology is still evolving.
- Companies are starting to think about IoT and use cases to find optimization within their businesses.

4.2. Demand expected to increase

- However, employers stated the demand for IoT will increase in the next few years as they launch IoT initiatives.
- Companies are exploring IoT now and aim to capitalize on the advantages of IoT within their organizations in the next few years.

4.3. Desire for internships for real world experience

- Most employers stated internships were extremely valuable for candidates to gain real world experience in applying IoT.
- Candidates with real world experience from internships will be highly employable.

4.4. Key skill *areas emerged*

- Employers desired candidates with key skill areas of hardware, software and networking
- Most companies need candidates with sensor knowledge while some candidates desired candidates with DevOps knowledge.

5. PROFESSIONALS DEMAND

Key themes have emerged from in-depth interview with working professional companies including Ma'aden, Siemens AG, Mobily STC, Sela for Power, Automation and Safety Systems (Sela-PASS), and Sadara Chemical Company.

5.1. Emerging and growing IoT demand

- IT professionals stated company demand for IoT is growing slowing as the IoT market in KSA is emerging.
- Not many IoT initiatives are being launched within companies currently but expected to increase.

5.2. Awareness & Excitement

- IT professionals lacked actual awareness of the inner workings of IoT and desired to know more about the field.
- Most professionals were excited about IoT and wanted to learn more and were interested in a certificate course and the masters program.

5.3. Real World Experience Desired

- Most professionals desired real-world experience in the form of applied learning and internships to gain real world experience and increase their employability.
- Internships are viewed as a value add to the overall learning experience of the program.

5.4. Desired Program Delivery

- Most IT professionals desired to take course on the weekend in order to continue working their jobs.
- Most professionals want to the in-person courses and some desired the ability to take some of the classes online.

6. CRITICAL SUCCESS FACTORS

Upon interviewing employers and professionals critical success factors emerged.

- Applied learning & practical training is key: Both employers and professionals stated that applied learning and practical training is vital for skill acquisition, employability and being market ready for employers.
- Vital need for training in tools & technology due to skill gap: Training in specific tools and various technologies in IoT such as sensors and software, a vital need for both professionals and employers as a large skill gap exists to use the tools and technologies.
- Demand for internships to acquire real world experience: Employers and professionals demand internships to facilitate the acquisition of real-world experience using the skills learned in the degree programs.
- International recognized degrees important for professionals: Professionals strongly desired an international recognized master degrees while employers desired candidates with skills in key tools and experience over an international degree.

7. RECOMMENDATIONS

- Launch the IoT certificate to align to short-term market needs.
- Launch the MSc IoT in the medium term to align with growing demand.
- Implement Critical Success Factors to create a unique value proposition.

8. CONCLUSION

This study explored the current IoT market dynamics and growth opportunities in Bahrain and KSA. Furthermore, this study analyzed the IoT market trends, maturity, demand, and forecasts in in Bahrain and KSA.

- Market demand is growing and projected to be medium demand in KSA and Bahrain in the next 3-4 years.
- IoT emerged in KSA around 2-3 years ago.
- Low demand for IoT but projected to grow in the medium term due to emerging IoT use cases.
- The IoT market is not mature and is exploring and growing.
- Most employers expressed that demand for IoT will increase in the future as is important.
- Professionals stated the IoT sector is growing slowly.
- Professionals were interested in an IoT certificate course showing demand for the short course.
- Professionals were interested in an MSc IoT. However, they needed more awareness and understanding of IoT and the benefits of the MSc specifically in IoT.
- Internship is key for professionals as they desire real world experience to increase employability.
- Top sectors for IoT are manufacturing, logistics, energy and government (smart cities).
- A key IoT application is Industrial IoT (IIoT) and KSA Eastern Province industrial hub is projected to have growing demand for IIoT.
- KSA and Bahrain are both working on IoT use cases and tech players recently launched IoT solutions.
- Technology providers in Bahrain and Saudi are providing IoT software solutions (AWS & STC).
- KSA's national data strategy aims to train 20,000 data and AI professionals by 2030 which includes IoT talent.

References

[1] B. Chatterjee, N. Cao, A. Raychowdhury, and S. Sen, ``Context-aware intelligence in resource-constrained IoT nodes: Opportunities and challenges," IEEE Design Test, vol. 36, no. 2, pp. 7-40, Apr. 2019.

[2] A. Nordrum and K. Clark, ``Everything you need to know about 5G," IEEE Spectr., Jan. 2019.

[3] Miorandi, D., Sicari, S., De Pellegrini, F., & Chlamtac, I. (2012). Internet of things: vision, applications and research challenges. Ad Hoc Networks, 10(7), 1497–1516.

[4] Lasrado, L. A., Vatrapu, R., & Andersen (2015) Maturity Models Development In Is Research: A Literature Review, IRIS Selected Papers of the Information Systems Research Seminar in Scandinavia, Vol. 6, 6.

[5] Ning, H., &Wang, Z. (2011). Future Internet of Things architecture: like mankind neural system or social organization framework? IEEE Communications Letters, 15(4), 461–463.

[6] Shen, G., & Liu, B. (2010). Research on application of Internet of Things in electronic commerce. Proceedings of the Third International Symposium on Electronic Commerce and Security (ISECS).

[7] Porter, M.E. and J.E. Heppelmann, How smart, connected products are transforming companies. Harvard Business Review, 2015. 93(10): p. 96.

[8] Industry Proposal for a Public Private Partnership (PPP) in Horizon 2020 (Draft Version 2.1), Horizon 2020 Advanced 5G Network Infrastructure for the Future Internet, 2020.

[9] N. Javaid, A. Sher, H. Nasir, and N. Guizani, ``Intelligence in IoT-based 5G networks: Opportunities and challenges," IEEE Commun. Mag., vol. 56, no. 10, pp. 94100, Oct. 2018.

[10] P. Kiss, A. Reale, C. J. Ferrari, and Z. Istenes, ``Deployment of IoT applications on 5G edge," in Proc. IEEE Int. Conf. Future IoT Technol. (Future IoT), Eger, Hungary, Jan. 2018, pp. 1-9.

[11] D. Wang, D. Chen, B. Song, N. Guizani, X. Yu, and X. Du, ``From IoT to 5G I-IoT: The next generation IoT-based intelligent algorithms and 5G technologies," IEEE Commun. Mag., vol. 56, no. 10, pp. 114-120, Oct. 2018.

Artificial Intelligence in Web Accessibility: Potentials and Possible Challenges

Jinat ARA[a*], Cecilia SIK-LANYI[b]

[a] *Department of Electrical Engineering and Information Systems, University of Pannonia, Egyetem u. 10, Veszprem 8200, Hungary*
Email: jinat.ara@virt.uni-pannon.hu
[b] *Department of Electrical Engineering and Information Systems, University of Pannonia, Egyetem u. 10, Veszprem 8200, Hungary*
Email: lanyi@almos.uni-pannon.hu

Abstract

In this era of computing, online content is rapidly growing. Thus, ensuring web accessibility remains a major concern for web technologists. Among the massive number of advanced technologies, artificial intelligence is a technological advancement with immense potential to improve the accessibility of web content, especially for people with disabilities. Therefore, in this work, we studied the existing works associated with artificial intelligence developments to assess its effectiveness in web accessibility. Based on our findings, we address some of the potentials of artificial intelligence and possible challenges in the context of web accessibility. In terms of the ground of AI, we address some implications that need to consider in forward to inspect artificial intelligence in web accessibility to improve its performance and functionality.

Keywords: Artificial intelligence, web accessibility, disability, AI potentials, AI challenges, assistive technologies, world wide web

1. INTRODUCTION

The World Wide Web provides a wide range of information to improve people's lives [1]. Especially, web makes the internet platform easier for people with disability, as people with disabilities have several barriers to interacting and accessing digital information [2]. Nowadays, people with disabilities can easily access information with the help of web. In the past, web platform was not accessible for people with disabilities. Therefore, the World Wide Web Consortium (W3C) based Web Accessibility Initiative (WAI) developed several guidelines associated with accessibility known as Web Content Accessibility Guidelines (WCAG) [3][4]. These guidelines aim to ensure accessible web content to people with disabilities without any barrier.

To implement the WCAG, web developer uses several advanced technologies to ensure that the content of the web is accessible to people with disabilities. Among several advanced computer technologies, crowdsourcing and reasoning are more generic and conventional techniques to improve web accessibility for users (user with disability). Though these techniques are effective, they have some limitations, such as they require pre-knowledge that is time-consuming and might produce an inaccurate result [5]. Therefore, Artificial Intelligence (AI) and Machine Learning (ML) considers the most effective techniques to employ the WCAG principles and improve accessibility. Among several artificial intelligence techniques, case-based reasoning and knowledge base solutions are more effective and

* Corresponding author.

popular in web accessibility research [6]. Case-Based Reasoning (CBR) is an AI technique that performs using the knowledge of previous cases. It also allows using the experiences of experts in web accessibility evaluation. Furthermore, the knowledge base executes through expert knowledge and allows to identify the solution based on the predefined information from the associated field. These advanced technologies ensure immense opportunities to develop solutions for people with disability.

Nowadays, few renowned global technology companies have started implementing Artificial Intelligence to improve accessibility problems [7]. For example, Facebook uses AI for the automatic alt-text feature to support users with visual disabilities. Google uses advanced speech technology to make the service accessible and more convenient for people with disabilities. Few companies bring smart assistive technologies such as AI-based smart wheelchairs for people with moving disabilities and smart glasses for people with vision disabilities. Therefore, Artificial intelligence can be an effective solution in digital accessibility research that will benefit people with disabilities. Nowadays, web researchers are implementing web accessibility guidelines through artificial intelligence technology. However, AI concepts implementation in every single web content accessibility guideline is challenging [8]. Still, researchers are working on implementing AI in digital accessibility to make the internet platform accessible to people with disabilities.

Therefore, according to the importance of Artificial Intelligence, in this paper, we focus on the intelligence of AI and its associated possible challenges to implement and improve digital web accessibility. The purpose of this paper is to provide a detailed understanding of AI with its potentials and associated challenges for those who are working as website developers, associated people who want to improve, develop, and research on the accessible and barrier-free web.

The remaining part of the paper is structured as follows: Section II describes several potential areas of AI to improve web accessibility. Section III shows the associated challenges of AI to implement in web accessibility. Some implications address in section IV. Finally, the conclusion of the work describes in section V.

2. POTENTIALITY OF ARTIFICIAL INTELLIGENCE IN WEB ACCESSIBILITY

Artificial Intelligent is frequently used in several applications with disabilities. This technology aims to improve the standard of life with disabilities. Though AI has significant potential, a few years back, the scenario of this intelligence was not the same as recent. In previous, AI was not common in web research to improve web accessibility for people with disabilities. However, in the current research, researchers are frequently using AI to improve the accessibility of the web to introduce barrier-free webpages for people with disabilities. Therefore, in this section, some potentiality of AI in web accessibility have focused.

2.1. Artificial Intelligence in Webpage Image Text Alternative

Ensuring appropriate image text alternatives is an essential requirement of web accessibility guidelines for people with visual and cognitive disabilities [9]. People with disabilities use several assistive technologies to access and understand web information. Therefore, providing the appropriate information to people with disabilities is crucial. As most of the information on the web is represented through images thus, ensuring a standard set of guidelines is urgent for the images. In the current internet platform, webpages are not using text alternatives for representing images [10]. Sometimes, the provided text alternative or tags are not appropriate or hard to understand about the actual meaning of the image.

```
<h2 id="evaluation-section" class="css-title css-title-evaluation css-marginT60 css-fontSize32">What does TUET evaluate?</h2>
<p class="text-center align-mobile">It evaluates the usability and accesibility of toys and games considering three impairments:

<div class="row css-marginT50">
    <div class="col-md-4">
        <img src="images/childs/c1.png" class="css-child-image" alt="">
    </div>

    <div class="col-md-4">
        <img src="images/childs/c2.png" class="css-child-image" alt="">
    </div>

    <div class="col-md-4">
        <img src="images/childs/c3.png" class="css-child-image" alt="">
    </div>
</div>
```

Figure 1: Snippet of a web page source code

For example, Figure 1 shows a snippet of a webpage source code where the image alt-text is null, or the image has a missing text alternative that introduces inaccessibility of webpages. This technique helps to improve the accessibility of webpages for people with disabilities who rely on several assistive technologies such as screen reading users. Therefore, without proper and concise image text alternatives, it might cause potential inaccessibility. Nowadays, artificial intelligence is applied to generate text alternatives to images. It can modify the source code to ensure webpage accessibility. For example, Wu et al. [10] proposed an artificial intelligence-based automatic image text alternative generate techniques for blind people of social networks such as Facebook. They suggested that artificial intelligence is an effective technology to generate image text alternatives and improve web accessibility.

2.2. Artificial Intelligence in Webpage Image Description

Webpage image description/caption represent the meaning of the image. Also, it helps to understand the purpose of the image. Nowadays, some global companies such as Facebook, Google, Microsoft are using this functionality to support accessibility. In recent days, to improve the quality of image descriptions of webpages, web researchers suggested web developers incorporate AI instead of considering traditional human techniques. Artificial Intelligence based image description formulation is the process of automatically generating the appropriate title/description of the images. AI-based image recognition is prominent, as it is more effective and accurate than conventional techniques like human-modified image description. This function also helps to add in the web index and improve the visibility of the webpage on the World Wide Web.

"a close up of a cake on a plat" [11]

“a busy city street filled with lots of traffic” [11]

Figure 2: AI based image description

It helps screen reader users to understand the content of the image (whether the text alternative is present or not). It also helps to improve the abstraction of the images accurately. For example, Singh et al. [11] generate two image descriptions using AI, particularly the machine learning technique, as shown in Figure 2. These generated image descriptions are in detail and semantically meaningful to understand image content, especially for people with disabilities. Therefore, they emphasized that AI is an effective technique to generate image descriptions that might help to improve web accessibility.

2.3. Artificial Intelligence in Webpage Video Captioning

In terms of accessibility, video captioning is a potential option to make the content accessible to people with disabilities such as cognitive or hearing disabilities. According to the world-leading company Google, video captioning is beneficial to spread the information to people, not only the people with disability but also for the users who are not comfortable with the spoken language in the video [12]. In other words, video caption is the process of language translation that helps understand the same video content among millions of people in different spoken languages. AI brings a wide array of improvements in video captioning, and the YouTube platform also uses AI for its video captioning function. Therefore, AI could be a better solution or technique for webpage video captioning that will help to improve the accessibility of webpages. Still, in web accessibility research, it's an initial concept only. In the future, AI could be an excellent solution to transform all the webpage videos into their video captioning function or translated version.

2.4. Artificial Intelligence in Webpage Chatbot System

A chatbot is a computer program to make interaction or communication easier [13]. Generally, there are two types of chatbot: textual and voice chatbot. Textual chatbots allow people to interact with multiple people through exchanging text among each other, such as question answering chatbots. Besides, a voice chatbot allows the interaction of multiple people through exchanging voice messages instead of exchanging text, such as Amazon Echo. Figure 3 shows the textual and voice chatbot example in a website. This digital communication system aims to make the digital platform accessible and understandable. Nowadays, webpage authorities started to launch chatbots to make the page accessible, especially for people with disabilities. In specific, people with disabilities have difficulty in finding information. Thus, this digital tool or chatbot helps them find information easily and effectively.

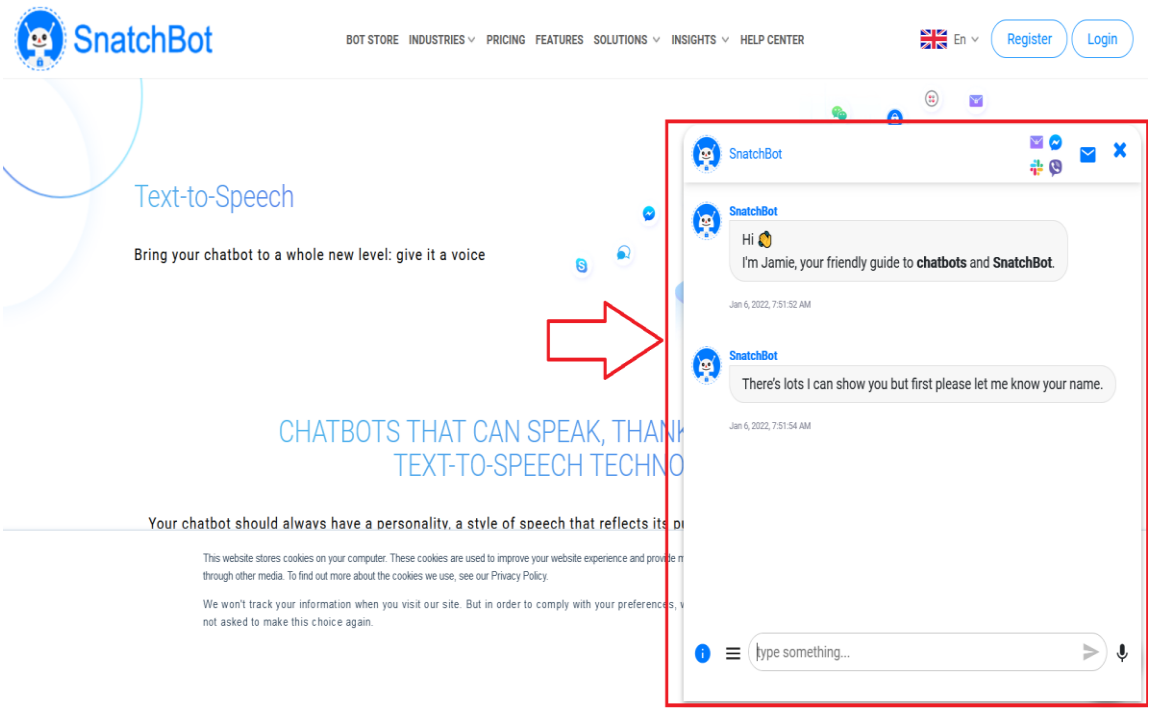


Figure 3: Chabot in webpages

Suseela et al. [14] propose an AI-based chatbot for the PMIST website. They aimed to implement an open discussion platform using regular languages handling techniques such as artificial intelligence and natural language processing (NLP) to provide a human-like conversational experience to the user. Gupta et al. [15] proposed an AI-based chatbot for an E-commerce website. They aimed to propose an automated online assistant system to help the user in decision-making about product selection. These AI-based chatbots can fulfil user satisfaction by ensuring the accessibility of web pages.

2.5. Artificial Intelligence in Webpage Search Function

Generally, webpage aims to serve information to the community. Webpage information is categorized and organized into several pages, such as the home page. As information distributes on several pages, thus sometimes it makes difficult to access and find information for users with disabilities. Therefore, webpage search function is prominent for users with disabilities to find information without complexity. Focusing on these issues, nowadays, webpage authorities have started to add a search function to make all the information accessible to people with disabilities, as shown in Figure 4. However, this search function has some inaccessibility, such as it might not work correctly, generate wrong search results, etc. Therefore, scholars studied these issues and found that AI could be a better solution to improve the performance of webpage search function by retrieving the proper result and making the web page accessible to the community [16].

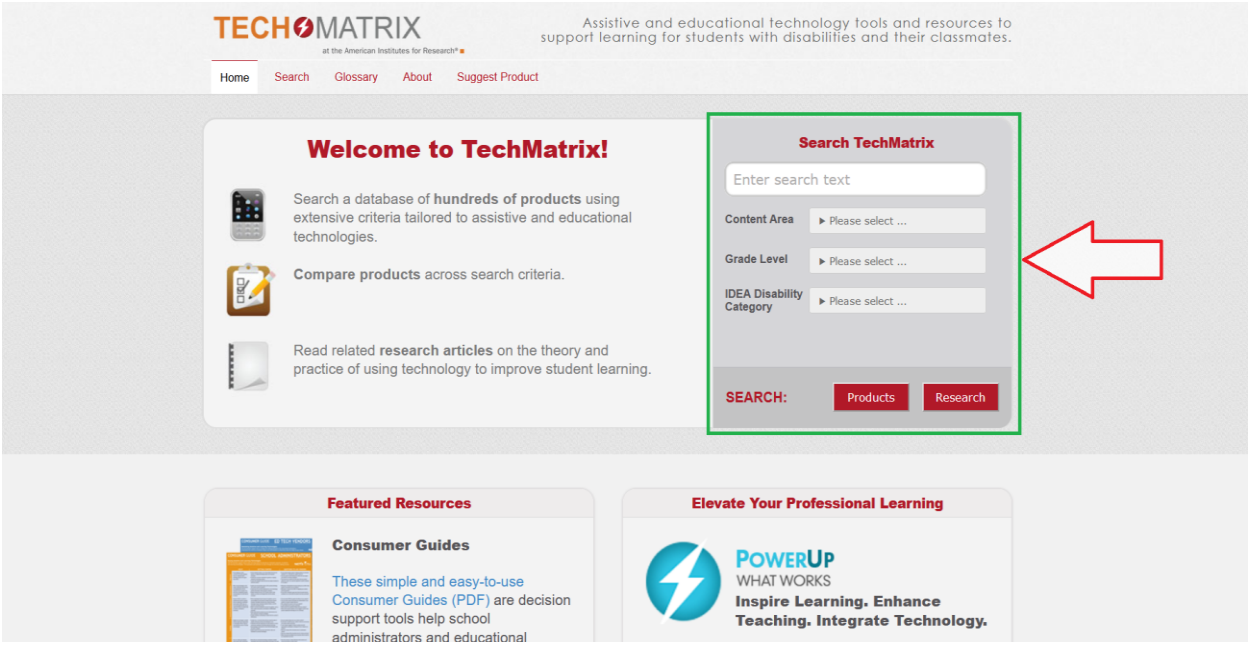


Figure 4: Webpage search function

2.6. Artificial Intelligence in Webpage Text Processing

Webpage text contents are heterogeneous unstructured data. This content is the prime indicator of sharing information or directing the correct message. However, this content might not be accessible to people with disabilities because of several ambiguities such as long sentences, complex words, acronyms, complex expressions, etc. People with disabilities, especially cognitive disabilities, have difficulty with these ambiguities or issues. Thus, an effective text processing mechanism is essential to ensure accessible web text for people with disability. Sarker [17] studied several artificial intelligent techniques. This study suggested that artificial intelligence is an effective technology to process and classify text to understand web content effectively. It also added that Artificial intelligence has the potential to simplify web content text automatically, for example, emphasizing reading level by splitting long text into short text, summarizing the potential keywords, removing difficult words, etc. Therefore, automatic web page text processing with artificial intelligence might help to make the webpage content accessible.

2.7. Artificial Intelligence in Webpage RIAs

Rich Internet Applications (RIAs) is an interactive function that helps develop dynamic and interactive webpages [18]. In the context of dynamic webpages, sometimes webpage information is partially different from its source code because of several complex technologies such as CSS, javascript, etc. There are such possibilities that change through javascript command in source code might not correctly perceive/modify in the dynamic webpage that introduces accessibility barriers, especially for assistive technology users. Nowadays, to improve such issues, AI techniques have been implemented by scholars. Using AI technology, it is possible to directly modify the DOM (Document Object Model) structure of RIAs and the source code that improve such issues and make a webpage accessible to people with disability [19].

2.8. Artificial Intelligence in Webpage Language Translation

Web page language translation is an important aspect of information technology to ensure a multilingual and globally accessible webpage. Past studies depict that recent webpage have no multilingual version or translation options that introduce accessibility issues [20]. However, web page translation is a complex process that produces several ambiguities such as improper translation, missing information, etc. Therefore, machine learning could be a better solution to ensure webpage translation more effectively. Cortis et al. [21] proposed a novel machine learning architecture for webpage translation from Maltese (Malta's national language) to English. This study emphasized that machine learning improves the accuracy of language translation that useful than several other linguistic technologies.

2.9. Artificial Intelligence in Webpage Screen Reading

Webpage screen reading is a process of webpage reading through screen reading assistive technologies such as VoiceOver (for the people who have vision difficulty). Several screen reading applications developed in the last few years based on several technologies such as generic rule-based models. These existing screen reading applications are effective but not free from limitations. For example, screen reading assistive applications recognize the webpage table and list items inappropriately. Some screen reading applications cannot distinguish the actual text and unnecessary text, such as advertisements on the webpage. Therefore, Mathur et al. [22] proposed AI-based web content detection models to improve existing barriers. This work emphasized that artificial intelligence might be an effective solution for screen reading applications to identify the relevant information.

3. CHALLENGES WITH ARTIFICIAL INTELLIGENCE IN WEB ACCESSIBILITY

Past research reveals that artificial intelligence has immense potential to improve web accessibility [23]. However, to implement AI in web accessibility, some challenges might reduce the accuracy [4]. Throughout this section, we will describe some possible challenges of AI that might reduce the effectiveness of the development and limited accessibility.

3.1. Challenges with Image Description

Generally, description/caption represents the meaning of webpage images. This functionality helps people with disability who use assistive technology to access and understand the web content. Though AI can generate an automatic description of images, sometimes it introduces some inappropriate or ambiguous results. A sighted user can easily understand and correct the result. But it is impossible to understand the quality of the generated caption or description for people with disabilities such as blind or cognitive disability. Sometimes, an automated system provides ambiguous results as it might not consider all the objects of images, or algorithms of the system might not focus on all the principles of WCAG standards that introduce misleading information. Therefore, in the accessibility context, ensuring proper automated AI-based image description generation is quite challenging. To overcome such challenges, algorithms of the automated system should modify according to WCAG standards, such as descriptions should be under 125-characters and relevant to the images and should focus on the relevant other image concepts.

3.2. Challenges with System Infrastructure

Web contents are unstructured with different objects such as simple natural text, images, videos, URLs, etc. Thus, to implement AI techniques, developers need to maintain several databases. The databases are always running in the server to access the information. Therefore, to ensure consistent services, AI models need high-performance GPUs that are cost-effective, which is another challenging issue to implement AI on the web to ensure its accessibility. The prime task of web researchers is to identify an alternative process to minimize the associated GPU cost to incorporate AI to improve web accessibility.

3.3. Challenges with Accuracy

In terms of accuracy, several issues might arise during the implementation of AI technology. For instance, in a chatbot system, AI might produce wrong information or might not retrieve the exact information with user intention. Chatbot system execute logical inference engines to process natural language through several advanced technologies. Thus, handling natural language and providing completely effective output is quite challenging. Similarly, in a search system, sometimes AI produces the wrong result as mapping and indexing of the resources is a complex process and quite difficult to handle. Sometimes grammatical structure is not followed properly by AI technology. Another challenge is language translation through lexical resources. Generally, AI models are partially reliable on lexical resources. Ensuring adequate and proper lexical resources of different languages is difficult. Therefore, managing the required information and retrieving high accuracy is challenging for current AI technology.

3.4. Challenges with Application Authenticity

Artificial Intelligence-based web applications are required lots of user-sensitive data/information to provide secure and effective services. Sensitive information sharing might initiate privacy and security risk. Sometimes it acts as a safety issue for people with disability. For instance, assistive applications record user information on the server. Usually, recorded information is associated with their particular problems, such as reading capabilities. In many situations, this sensitive or personal information might disclose. It will be unacceptable for people with disabilities if the information is disclosed. In such cases, it might introduce dissatisfaction and violation of authenticity. Therefore, handling these issues is challenging for AI technology in the current internet platform.

3.5. Challenges with Acceptability

User acceptability is a significant challenge of AI in web applications. Artificial intelligence has several advanced features, and these features are modified frequently. Therefore, the functionalities of web access applications are updated frequently, and the accessing prototypes or application designs do not remain the same. Additionally, application structure is not simpler to understand, and sometimes the instructions are complex for people with a mental disorder. Due to complex instructions, users with disability need to ask for help from another person to access the application, which is not convenient for most people. Therefore, AI-based web accessing applications should develop less complex application functionality. Thus, people with disability could access the application without asking for help from others. Ensuring simple functionality and developing fewer complex applications is challenging for current artificial intelligent technology.

3.6. Challenges with Context Semanticity of Advanced Web Browsing Application

Nowadays, several advanced web browsing applications are developed based on artificial intelligence, for example, several assistive technologies. These assistive technologies are effective with several functionalities. For instance, translate webpage text from one language to another, converting sign language to human language text or voice. Artificial Intelligence converted the webpage language into other languages and the sign language into human interpretation using advanced machine-readable algorithms. Sometimes these algorithms can easily be intercepted, and the interpreter result is likely to be biased. Therefore, all the translated languages are not accurate. Sometimes produce an incorrect conversion of the language that represents poor semantic meaning. The converted sign language is not fully meaningful like human interpretation. Therefore, there are several challenges to implementing

AI in web browsing applications. Developing precise web browsing applications with the proper semantic meaning is a relatively challenging task for current AI technology.

4. IMPLICATIONS SHOULD CONSIDER

Our findings of this work shows that artificial intelligence is an effective computer technology to develop several automatic tools for people with disabilities. Therefore, it might be an effective technology to improve web accessibility through automated functionalities and make webpages accessible and convenient for people with disabilities. However, sometimes implementing all the WCAG guidelines through artificial intelligence is challenging. Besides, AI is not a better choice to ensure all the webpage functionalities. However, the existing challenges are in automated image description, system infrastructure, accuracy, authenticity, acceptability, and semanticity. Artificial intelligence could solve some tasks effectively, but sometimes impossible to achieve the desired satisfaction/accuracy level due to some issues, such as providing accurate text alternatives for images. As artificial intelligence is a newly experimenting technology in web accessibility, these problems might dilate the final result. To overcome such challenges, researchers should improve the algorithmic structure to generate accessible image descriptions and improve the accuracy of machine translation. In the future, developers should concern about GPU cost. Also, they should ensure the authenticity of the user information with an advanced acknowledgment system. For instance, an acknowledgment should send to the user before sharing or disclosing the user information. Upon their acceptance, it should share with other sources (verified by users). In addition, developers should focus on less complex software design. Frequent changes in the functionality should ignore. Moreover, to improve the satisfaction level of people with disabilities, developers should focus on human interface design guidelines and improve the semantic meaning of the web content. These challenges increase the importance of future research to implement AI technology in web accessibility to improve its performance.

5. CONCLUSION

Ensuring web accessibility for people with disability is an important issue. Several advanced technologies have immense potential to provide a completely accessible web. In terms of web accessibility, it's rarely researched the effectiveness of these technologies. Therefore, in this paper, we studied the potentials of Artificial Intelligent technology to understand its effectiveness for improving web accessibility. However, with several advancements, there are some drawbacks of artificial intelligence as artificial intelligence is the new concept for implementing guidelines and providing accessible features. This study might help understand the possibilities and challenges of artificial intelligence in the current web. Additionally, it might help initiate future advancement to overcome such challenges and improve web accessibility with advanced accessible features.

ACKNOWLEDGEMENT

The authors would like to thank the support of the CA19104–Advancing Social inclusion through Technology and EmPowerment project: https://www.cost.eu/actions/CA19104/#tabs|Name:overview

REFERENCES

[1] Aizpurua, A., Harper, S., & Vigo, M. (2016). Exploring the relationship between web accessibility and user experience. *International Journal of Human-Computer Studies*, *91*, 13-23.

[2] Yesilada, Y., Brajnik, G., Vigo, M., & Harper, S. (2015). Exploring perceptions of web accessibility: a survey approach. *Behaviour & Information Technology*, *34*(2), 119-134.

[3] Brajnik, G. (2008, September). Measuring web accessibility by estimating severity of barriers. In *International Conference on Web Information Systems Engineering* (pp. 112-121). Springer, Berlin, Heidelberg.

[4] Leuthold, S., Bargas-Avila, J. A., & Opwis, K. (2008). Beyond web content accessibility guidelines: Design of enhanced text user interfaces for blind internet users. *International Journal of Human-Computer Studies*, *66*(4), 257-270.

[5] Wald, M., Ding, C., & Draffan, E. A. (2021, June). Introduction to Workshop: Overcoming accessibility gaps on the Social Web. In *13th ACM Web Science Conference 2021* (pp. 1-2).

[6] Avila, C., Baldiris, S., Fabregat, R., & Guevara, J. C. (2012, October). Accessibility evaluation improvement using case based reasoning. In *2012 Frontiers in Education Conference Proceedings* (pp. 1-6). IEEE.

[7] Gleason, C., Pavel, A., McCamey, E., Low, C., Carrington, P., Kitani, K. M., & Bigham, J. P. (2020, April). Twitter A11y: A browser extension to make Twitter images accessible. In *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems* (pp. 1-12).

[8] Hong, J. (2018, October). Accessible Human-Error Interactions in AI Applications for the Blind. In *Proceedings of the 2018 ACM International Joint Conference and 2018 International Symposium on Pervasive and Ubiquitous Computing and Wearable Computers* (pp. 522-528).

[9] Duarte, C., Duarte, C. M., & Carriço, L. (2019, May). Combining semantic tools for automatic evaluation of alternative texts. In *Proceedings of the 16th International Web for All Conference* (pp. 1-4).

[10] Wu, S., Wieland, J., Farivar, O., & Schiller, J. (2017, February). Automatic alt-text: Computer-generated image descriptions for blind users on a social network service. In *Proceedings of the 2017 ACM Conference on Computer Supported Cooperative Work and Social Computing* (pp. 1180-1192).

[11] Singh, S., Bhandari, A., & Pathak, N. (2018, April). Accessify: An ML Powered Application to Provide Accessible Images on Web Sites. In *Proceedings of the 15th International Web for All Conference* (pp. 1-4).

[12] Chen, H., Li, J., Frintrop, S., & Hu, X. (2021). Annotation Cleaning for the MSR-Video to Text Dataset. *arXiv preprint arXiv:2102.06448.*

[13] Vegesna, A., Jain, P., & Porwal, D. (2018). Ontology based chatbot (for e-commerce website). *International Journal of Computer Applications*, *179*(14), 51-55.

[14] Suseela, S. (2021). Artificial Intelligence based CHATBOT for PMIST websites. *Turkish Journal of Computer and Mathematics Education (TURCOMAT)*, *12*(10), 2047-2051.

[15] Gupta, S., Borkar, D., De Mello, C., & Patil, S. (2015). An e-commerce website based chatbot. *International Journal of Computer Science and Information Technologies*, *6*(2), 1483-1485.

[16] F. Zhang, N. Zhang, N. Shan and F. Gao, "Research of Webpage Complexity Influence on Search Behavior Based on Eye Tracking Experiment," *2021 IEEE 16th Conference on Industrial Electronics and Applications (ICIEA)*, 2021, pp. 527-532, doi: 10.1109/ICIEA51954.2021.9516347.

[17] Sarker, I. H. (2021). Machine learning: Algorithms, real-world applications and research directions. *SN Computer Science*, *2*(3), 1-21.

[18] Sloan, D. (2009). Special issue on web accessibility research. *Disability and Rehabilitation: Assistive Technology*, *4*(4), 209-211.

[19] Antonelli, H. L., Sensiate, L., Watanabe, W. M., & de Mattos Fortes, R. P. (2019, October). Challenges of automatically evaluating rich internet applications accessibility. In *Proceedings of the 37th ACM International Conference on the Design of Communication* (pp. 1-6).

[20] Kumari, S., Shetty, S., Shetty, A., Babu, S., & D'souza, S. (2021). Text Identification System for Translation of English Language. *Available at SSRN 3835110.*

[21] Cortis, K., Attard, J., & Spiteri, D. (2021, September). Malta National Language Technology Platform: A vision for enhancing Malta's official languages using Machine Translation. In *Proceedings of the First Workshop on Multimodal Machine Translation for Low Resource Languages (MMTLRL 2021)* (pp. 12-19).

[22] Mathur, S., Nikam, P., Patidar, H., Gaikwad, R. B., & Nayak, P. N. (2021, January). Machine-Learning directed Article Detection on the Web using DOM and text-based features. In *2021 IEEE 18th Annual Consumer Communications & Networking Conference (CCNC)* (pp. 1-5). IEEE.

[23] Abou-Zahra, S., Brewer, J., & Cooper, M. (2018, April). Artificial Intelligence (AI) for Web Accessibility: Is Conformance Evaluation a Way Forward? In *Proceedings of the 15th International Web for All Conference* (pp. 1-4).

Investigation of Fracture Prevention Effects of Composite Patches Repair on Cracked Aluminum Plates Experimental and Numerical Study

Mohammadjavad RANJBARAN [a*]

[a] *Graduate student (Islamic Azad University of Hamedan, Department of Mechanical Engineering, Mussivand, Hamedan, Iran), E-mail: mohammadjavadranjbaran@yahoo.com*

Abstract

Nowadays, composite materials are extensively applicable in various aspects including automotive, marine and most importantly aeronautical engineering because of their excellent characteristics. Innovative maintenance using materials with extraordinary features has led to contributing of composites with the goal of extending their lives services. Glass-epoxy composites are lifesaver, inexpensive and highly practical for repairing the damaged components of aeronautical structures. The present study has employed composite patching technique to repair 50 centrally cracked rectangular aluminum plates subjected uniaxial tensile loading experiment. The 600 KN Santam testing machine used for performing tensile tests. Then, the force-displacement linear graph for each sample was plotted and monitored by its user's software. Next, the Abaqus finite element software simulated the same testing conditions on developed 3D- models using XFEM method. Finally, the numerical and experimental results indicated 0.0266 error percentage between the real and simulated tensile loading tests. In addition, specimens repaired by composite patches whose glass fibers orientations angles are 0,90 proved to have the best optimum performance while those that were repaired by patches with fiber orientations angle -45, +45 had the maximum displacement extension before failure.

Keywords: glass-epoxy composite patching, crack, extended finite element method, aluminum alloy 7075, uniaxial tensile test

1. IINTRODUCTION

Makwana and shaikh revealed that the composite patch as an honest method of repair and reinforcement decreases the strain and its intensity [1]. Hosseini et el. concluded glass-epoxy patch repair doubled the fatigue lifetime of two-sided patched specimens [2]. The Composite patching was considered an on spot practical technique for repairing common and regular damages within the aluminum aircraft structures [3]. Impacts of moisture, temperature besides other contributing environmental factors determined to be the varied reasons directly influencing the repair durability of adhesive patching joints [4]. Also, Composite patching proved its capability for underwater repair applications of aluminum structures under tensile and bending loading [5]. Khalid Saeed and Muhammad Abid studied the performances of bonded composite patch as compared to metallic ones on aluminum alloy 2024 samples. They concluded that the fatigue lifetime of the specimens repaired by bonded composite patches enhanced approximately for quarter-hour [6]. Yu Zhiqiang et el. focused on the adhesive repair modification of cracked aluminum samples using carbon-aramid fiber/epoxy sandwich composite patch. It absolutely was found that the composite sandwiches with 3 layers of fibers increased the effectiveness of repair for both tensile and bending loads 86% and 190% respectively [7]. The composite patch repair on aluminum alloy 7075 specimens using graphite-epoxy at high stress

* Corresponding author.

levels when applying constant load caused delay in their fatigue life [8]. The rectangular shaped patches found to be more practical compared to oblique and elliptical geometries {[9], [10]}.This study has taken an additional step to analysis the effectiveness of the arrow-shaped composite patch repair experimentally and numerically.

1.1 Methodologies

Both experimental and simulation methods were undertaken to provide accurate and precise data for further analysis of the research.

1.1.2 Experimental Method

In this part of the study, the uniaxial tensile loading test was done on 50 rectangular aluminum alloy 7075 panels of 80 mm width, 150 mm length and 1 mm thick by employing the 600 KN santam testing machine (Figure 1) Each specimen with central crack lengthening 30 mm underwent tensile loading with the speed of 0.2 mm per minute to the failure spot. Single-sided arrow-shaped glass -epoxy composite patches reinforced the cracked panels. Plates positioned vertically between the lower and upper crossheads with 50 mm of gage length in the load-cell (Figure 2). In the next step, the user software of the testing machine was customized with desired geometry, area, length, width, thickness of samples and the required loading type.

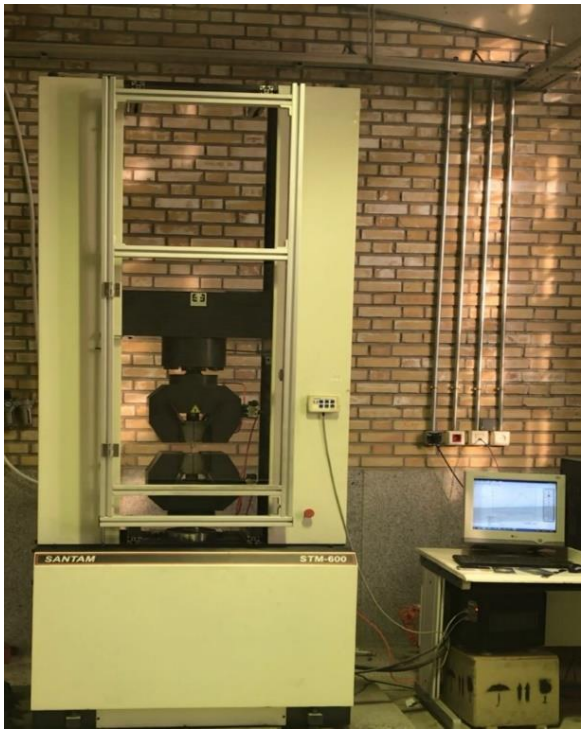


Fig.1. The 600 KN Santam Testing Machine

Fig.2. Specimen Positioning in the Load-Cell

English alphabets A to Q were assigned to each category of specimens characterized by following specifications. Alpha is half of an angle between two adjacent right and left sides. SL has been allocated for the length sides of arrow head composite patches. In addition, L represents the horizontal distance as the length and H indicates the height of each composite patch repairs. Table 1 shows the measurements for different patch categories.

Table 1. Measurements for Different Sample Categories

Category	Alpha Angle (degree)	Side Length (mm)	Horizontal Length L (mm)	Vertical Length H (mm)
A	50	30	60	40
B	30	20	55	13
C	53	25	50	40
D	53	25	45	45
E	61.35	30	45	55
F	36	23	55	27
G	40	10	26	13
H	30	13	40	13
I	20	20	55	13
J	40	20	45	25
K	35	23	55	26
L	52	35	65	55
M	40	20	45	25
N	36	23	55	27
O	49	18	55	27
P	20	15	50	10
Q	20	18	50	12

For safety reasons, the security shield of the testing machine was then closed. Tests conducted for several number of specimens of each category to increase the accuracy of experimental results. As tests were being performed, the Force-Displacement curve was plotted by the testing machine user software. The maximum tensile force and extension for all specimens repaired by composite patches with 0,90 to -45, 45 glass fibers orientations were obtained to the failure point (Table 2).

Table 2. Experimental Results for Specimens

Category	Specimen Number	Fibers Orientations (degree)	Max Tensile Load (Newton)	Max Displacement Extension (mm)
A	1	0,90	14583	4.561
A	2	-45,45	11911	3.535
B	1	-45,45	11139	3.250
B	2	0,90	11492	3.343
C	1	0,90	12258	3.642
C	2	-45,45	12258	3.357
D	1	0,90	12405	3.663
D	2	-45,45	11904	3.520
D	3	-45,45	13067	3.673
D	4	-45,45	12302	3.379
D	5	-45,45	12272	3.288
E	1	0,90	12537	3.720
E	2	-45,45	12464	3.705
E	3	-45,45	11640	3.461
F	1	-45,45	11154	2.794
F	2	0,90	10668	3.165
F	3	-45,45	11213	3.346
F	4	0,90	11242	3.336
G	1	0,90	12096	3.618
G	2	-45,45	14406	4.203
G	3	-45,45	13185	3.909
G	4	0,90	9962	2.897
H	1	0,90	9741	2.882
H	2	0,90	9933	2.998
H	3	-45,45	11125	3.297
H	4	-45,45	15583	6.093
I	1	0,90	10345	3.075
I	2	-45,45	11728	3.445
I	3	0,90	12155	3.637
I	4	-45,45	12155	4.756
J	1	0,90	11610	3.465
J	2	-45,45	12464	3.672
J	3	0,90	15936	4.741
K	1	0,90	10036	2.999
K	2	-45,45	11654	3.468

K	3	-45,45	9624	2.853
L	1	0,90	10153	3.043
L	2	-45,45	11345	3.395
M	1	-45,45	8182	2.472
M	2	0,90	8288	2.462
M	3	-45,45	13188	3.897
N	1	0,90	11581	4.510
N	2	-45,45	13405	3.997
N	3	0,90	11213	3.353
N	4	0,90	10786	3.188
O	1	-45,45	13479	3.951
O	2	0,90	14759	4.344
O	3	-45,45	11301	3.337
P	1	-45,45	10271	3.012
P	2	0,90	10536	3.102
Q	1	0,90	10271	3.026
Q	2	-45,45	9830	2.869

1.2. Numerical Simulation

1.2.1 Design of Part

Abaqus finite element software version 6.14 2021 was employed to numerically simulate the tensile loading test. The three-dimensional solid and shell extrusion features were used for the aluminum panel and crack with 30 mm of length. It should be noted that in accordance with experimental results of specimen number 3 of category J, the design of this repair patch considered to have the best and optimum geometry for simulation using the shell planar base feature (Figures 3, 4 & 5).

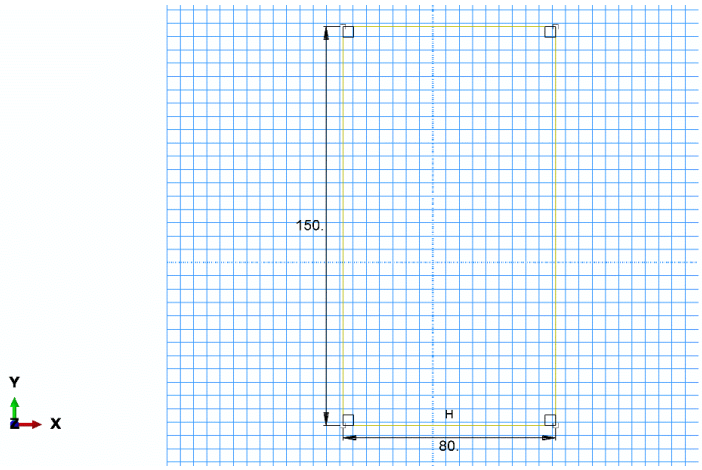


Fig.3. 2D Plate Sketch

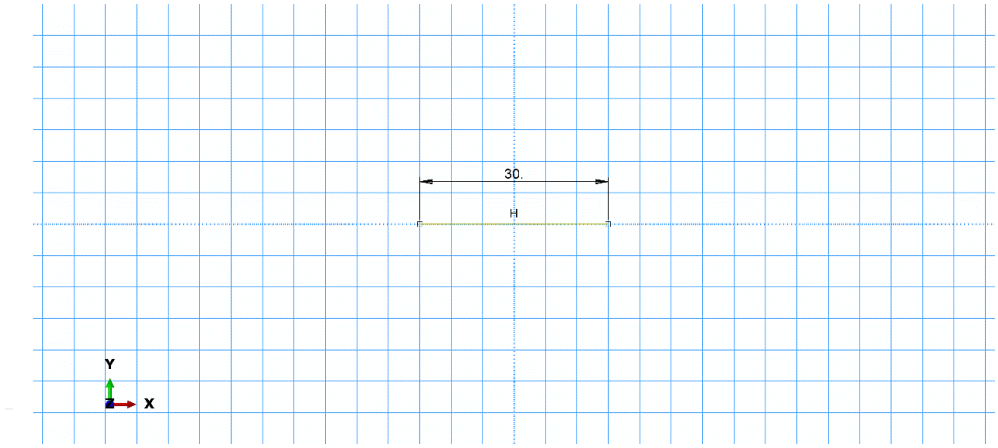


Fig.4. The Crack Sketch

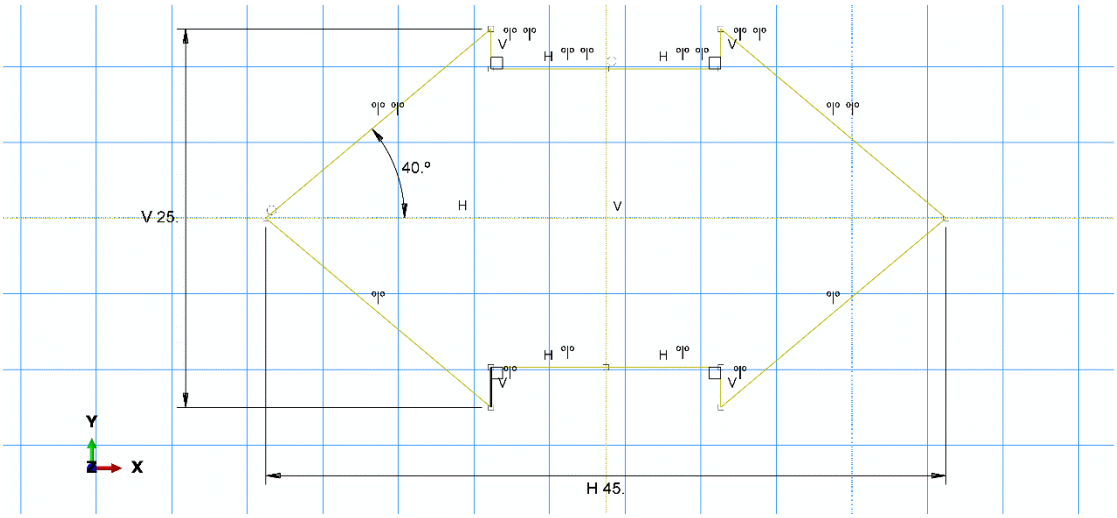


Fig.5. The Patch Sketch

1.2.2 Property Determination

Real specifications of aluminum alloy 7075 from the literature such as the Young's Modulus and Poisson's Ration were applied for the panel (Table 3).

Table 3. Material Characteristics of Aluminum Alloy 7075

Layer Name	Poisson's Ratio	Young's Modulus
Aluminum alloy 7075	0.33	71.7 (GPa)

Also, the engineering constants for the glass-epoxy composite patch considered as Table 4 shows.

Table 4. Glass-Epoxy Material Specifications

E1	E2	E3	G12	G13	G23	Nu12	Nu13	Nu23
40e9	10e9	10e9	3.8e9	3.8e9	3.4e9	0.30	0.30	0.40

The condition during which the crack propagated within the aluminum plate and caused failure was reported at maximum principal stress and displacement extension of 524 and 4.741 respectively. The composite layup feature was used in order to set the orientations of patch plies. Then, the plies each thickening 0.5 mm with 0 and 90 rotation angles were positioned. Next, axis 3 (Z) as the local material orientation system was chosen for the composite patch normal (Figure 6).

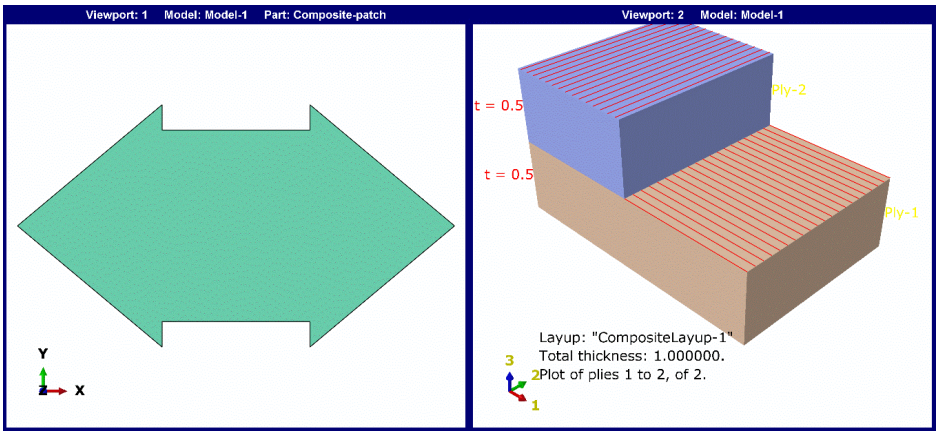


Fig.6. The Orientation of Patch Plies

1.2.3 Assembling

At this stage, two surfaces titled as the slave and master were assigned to the back of the patch and front of the plate to define the bond between them in interaction module. The central crack positioned with 25 mm of length from each right and left edges on the plate. To repair the specimen, the composite patch placed on the central crack with 17.5 mm of distance from both sides (Figures 7& 8).

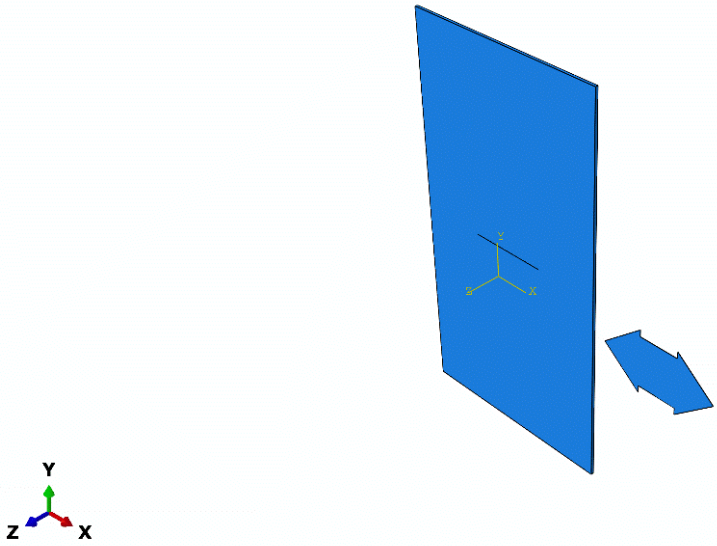


Fig.7. Positioning of the Crack

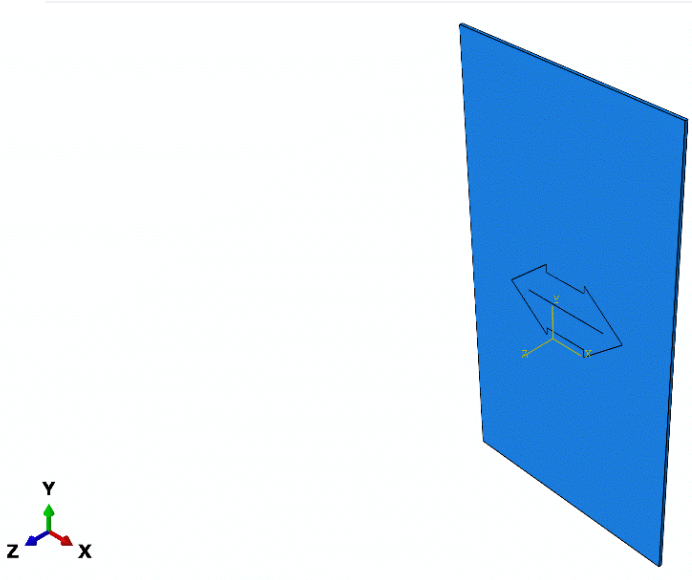


Fig.8. Central Crack on the Plate

1.2.4 Step

The general static procedure and 1 second as time period considered. To apply the extension speed of real testing conditions, 0.2 and 0.002 were chosen for the initial and minimum increment size.

1.2.5 Meshing

To mesh the plate, the hex element shape with linear geometric order was selected. Also, 0.2 absolute value and 2 as the approximate global size were further applied. It should be noted that the employed element shape for the plate was C3D8R (Figure 9).

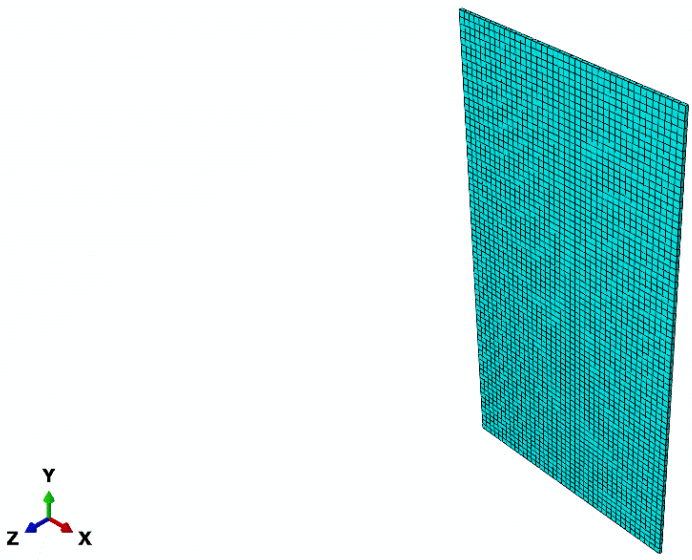


Fig.9. The Meshed Plate

Partitioning divided the composite patch into two triangular in each side and a separate rectangle in the middle. The structured meshing technique with quad element shape and the linear type of element S4R allocated for the meshing of rectangular geometry in the center. In addition, the Tri shape and the S3 element type with the same mesh method were assigned to the triangular geometries (Figures 10, 11& 12).

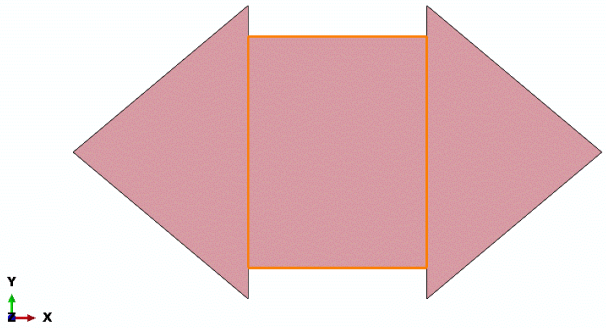


Fig.10. Partitioning of Patch

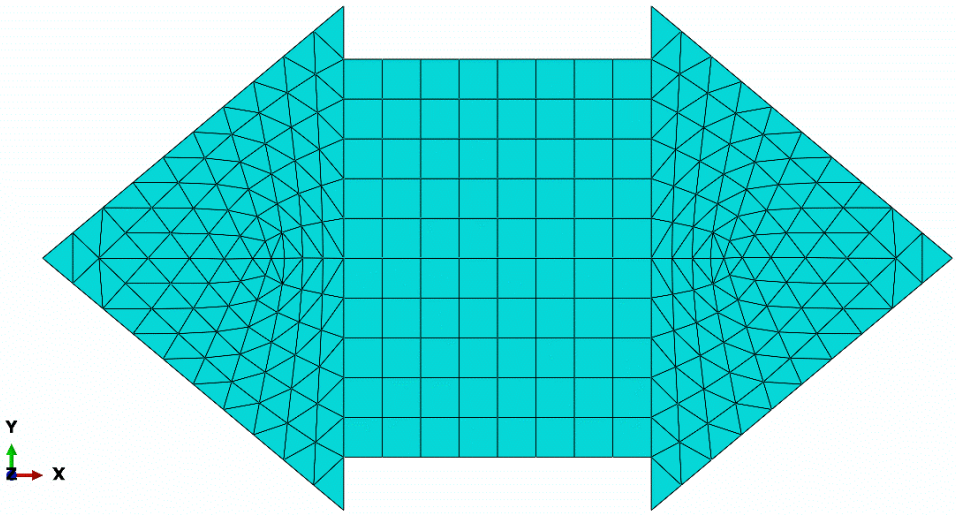


Fig. 11. Meshing of Patch

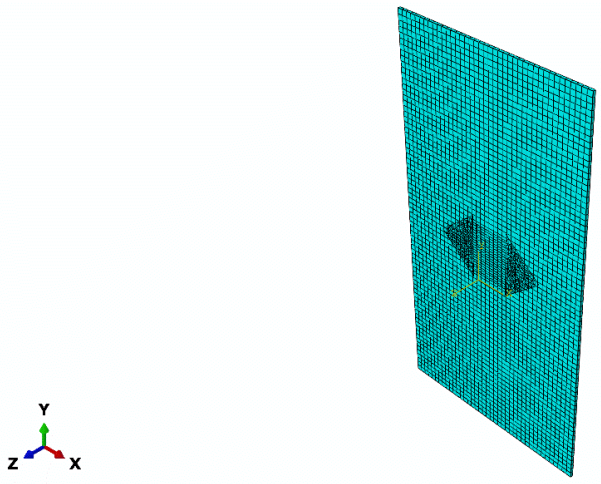


Fig.12. Fully-Meshed and Repaired Cracked Aluminum Plate

1.2.*6 Interactions*

The plate front surface was constrained to the back of the patch to create the bond using shell-to-solid coupling feature. The XFEM method was then consequently enabled for the simulation of crack propagation in the specimen (Figures 13 & 14).

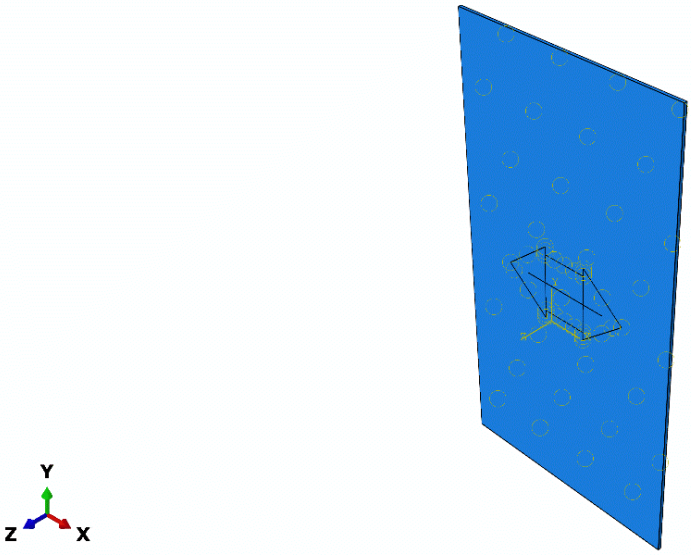


Fig.13. Bonding of Patch on the Surface of the Plate

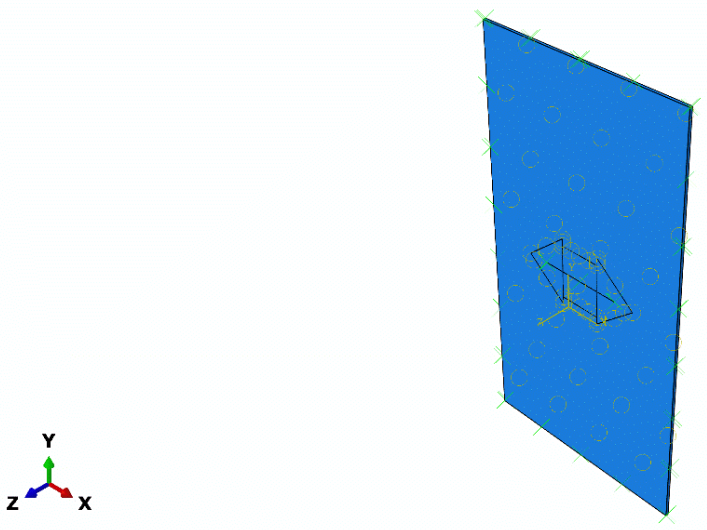


Fig.14. The Defined Domain for Crack Propagation

1.2.7 Loading

To define the loading conditions, two sets were created for the end and top of the aluminum plate by node selection. For the boundary conditions, the top-set subjected to Y direction as the only moving degree of freedom. The end-set was considered to be Encastre to simulate the fixed lower crossheads in the testing machine (Figure 15).

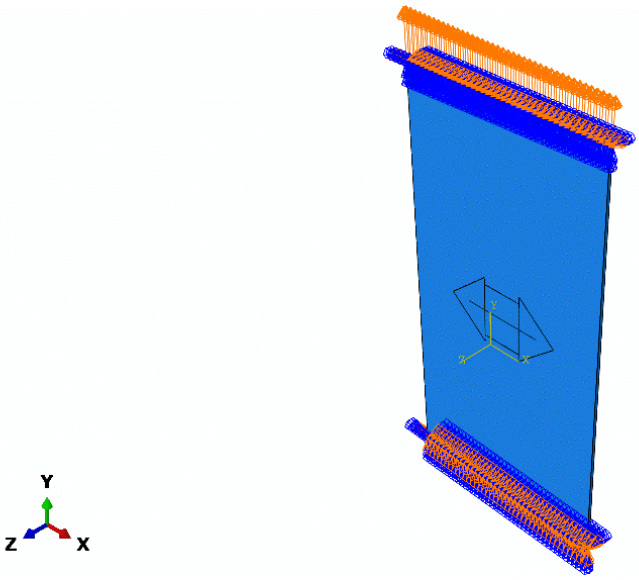


Fig.15: Defining Boundary Conditions for Tensile Testing

1.2.8 Job

In the job module, the simulated repaired plate with glass-epoxy composite patch was submitted for further analysis.

1.2.9 Visualization

The requested field outputs using the numerical results of the simulation are shown as in figure 16.

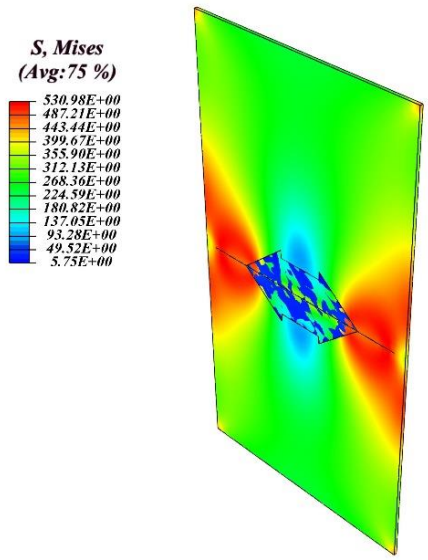


Fig.16. The Distribution of Misses Stress in Cracked Specimen

The force versus displacement extension graph for the composite patch with the optimum performance of repair was then plotted (Figure 17).

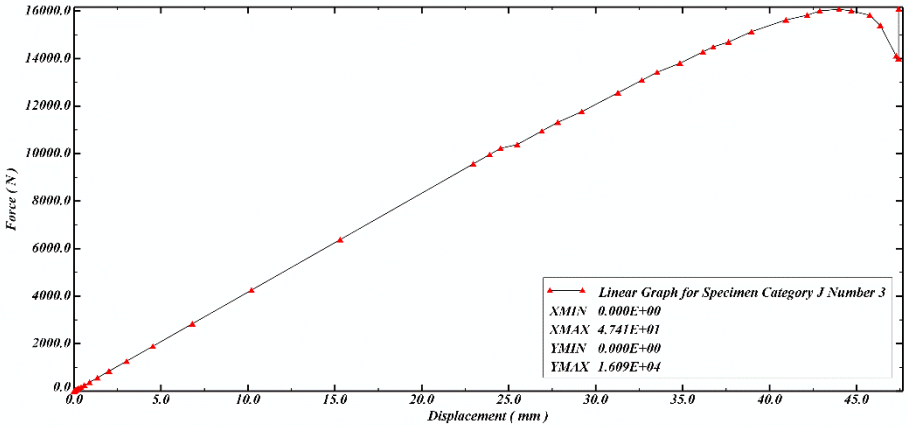


Fig.17. The Force-Displacement Curve for the Specimen Number 3 of Category J

The maximum tensile force and extension for specimens of different categories were obtained numerically. To investigate the data validity, the error percentage was calculated by comparing the experimental and numerical results (Tables 5& 6).

Table 5a. Comparison of the Numerical and Experimental Results for Sample Categories A to J

Category & Specimen Number	Maximum Numerical Tensile Load	Maximum Experimental Tensile load	Error Percentage
	14620	14583	0.0026
A2	11920	11911	0.0008
B1	11329	11139	0.0168
B2	11520	11492	0.0025
C1	12280	12258	0.0018
C2	12280	12258	0.0018
D1	12410	12405	0.0005
D2	11940	11904	0.0031
D3	13130	13067	0.0048
D4	12334	12302	0.0026
D5	12280	12272	0.0007
E1	12520	12537	0.0014
E2	12460	12464	0.0004
E3	11710	11640	0.0060
F1	11180	11154	0.0024
F2	10710	10668	0.0040
F3	11280	11213	0.0060
F4	11360	11242	0.0104
G1	12260	12096	0.0134
G2	14556	14406	0.0104
G3	13210	13185	0.0019
G4	9969	9962	0.0008
H1	9809	9741	0.0070
H2	10204	9933	0.0266
H3	11240	11125	0.0103
H4	15610	15583	0.0018
I1	10450	10345	0.0101
I2	11729	11728	0.0001
I3	12360	12155	0.0166
I4	12190	12155	0.0029
J1	11730	11610	0.0103
J2	12469	12464	0.0005
J3	16089	15936	0.0096

Table 5b. Comparison of Numerical and Experimental Results for Sample Categories K to Q

Category & Specimen Number	Maximum Numerical Tensile Load	Maximum Experimental Tensile Load	Er ror Percentage
K1	10121	10036	0.0084
K2	11712	11654	0.0050
K3	9630	9624	0.0007
L1	10257	10153	0.0102
L2	11440	11345	0.0084
M1	8386	8182	0.0244
M2	8339	8388	0.0059
M3	13220	13188	0.0025
N1	11600	11581	0.0017
N2	13570	13405	0.0122
N3	11330	11213	0.0104
N4	10770	10786	0.0015
O1	13480	13479	0.0001
O2	14760	14579	0.0123
O3	11380	11301	0.0070
P1	10390	10271	0.0115
P2	10580	10536	0.0015
Q1	10340	10271	0.0067
Q2	9840	9830	0.0019

2. RESULTS

1. The data validation between the results obtained from experimental tests and numerical simulations showed maximum 0.0266 of error percentage for XFEM method.

2. The composite patches with glass fibers orientations angles of 0,90 significantly increased the durability of the repair up to 1593 newton.

3. Cracked specimens repaired by patches with -45, 45 degree of glass fibers orientations extended more meanwhile they failed by rise in tensile force.

3. DISCUSSION AND CONCLUSIONS

In this study the impacts of composite patch repair with different glass fibers orientation angles on cracked aluminum alloy 7075 plates were investigated. The 600KN Santam testing machine was employed to perform the experimental tensile tests. Then, each of cracked specimen was numerically simulated with Abaqus software using the extended finite element method. The validation of experimentally obtained results indicated the least error percentage in comparison to numerical ones. It has been found out that composite patching technique highly enhance the durability of repair in aluminum structures. Taking everything into consideration, with the aid and contribution of technology, failure of aluminum components is highly predictable under most of the conditions.

Declarations

Ethical approval and consent to participate:

Not applicable.

Consent for publication:

Not applicable.

Availability of data and materials:

All the required data are provided as within tables and also numbered sections explaining how the procedure or process was conducted.

Competing interest:

The author states no conflict of interests as the only creator of the manuscript.

Funding:

The author states no funding involved

Author's contributions:

The author states that the design of the study, collection, analysis and interpretation of data in writing the manuscript belongs to him.

Acknowledgements

Mohammadjavad Ranjbaran is a graduate student at the mechanical engineering department of Islamic Azad University of Hamedan, Iran.

References

[1] Alpesh H. Makwana & A.A. Shaikh. The role of patch hybridization on tensile response of cracked panel repaired with hybrid composite patch: experimental and numerical investigation The Journal of Adhesion: 2021, Volume 97, Issue 1, 53-87.
[2] K. Hosseini, M. Safarabadi, M. Ganjiani, E. Mohammadi & A. Hosseini. Experimental and numerical fatigue life study of AL plates reinforced by glass-epoxy composite patches in different stress ratios. The international journal of Mechanics Based Design of Structures and Machines: 2021, Volume 49, Issue 6, 894-910.

[3] Z. P Marioli-Riga, G J. Tsamasphyros, G. N. Kanderakis Design of Emergency Aircraft Repairs Using Composite Patches. Journal of Mechanics of Composite Materials and Structures: 2001, Volume 8, Issue 3,199-204.
[4] S. Budhe, M. D. Banea & S. de Barros Bonded repair of composite structures in aerospace application: a review on environmental issues. Journal of Applied Adhesion Science: 2018, Volume 6, Article number 3.
[5] R. W. Bianchi, Y. W. Kwon, E. S. Alley Composite Patch Repair for Underwater Aluminum Structures. Journal of Offshore Mechanics and Arctic Engineering:2019, Volume 141, Issue 6.
[6] Khalid Saeed, Muhammad Abid. Crack growth performance of aluminum plates repaired with composite and metallic patches under fatigue loading. Institute of Electrical and Electronics Engineers. Fourth International Conference on Aerospace Science & Engineering (ICASE):2015.
[7] Xiaoyan Liu, Jiacheng Wu, Jiaojiao Xi, and Zhiqiang Yu. Bonded Repair Optimization of Cracked Aluminum Plate by Microwave Cured Carbon-Aramid Fiber/Epoxy Sandwich Composite Patch. Materials (Basel): 2019, Volume 12, Issue 10, 1665.
[8] M. Benachour, F.Z Seriari, N. Benachour and M. Benguediab. Beneficial Patch Repair Effect on Fatigue crack Growth of Al-Alloy 7075. Applied Mechanics and Materials:2012, Volume 225, 158-164
[9] Baghdadi Mohammed, Serier Boualem, Salem Mokadem, Zaoui Bouchra, Kaddouri Khacem. Modeling of a cracked and repaired Al 2024T3 aircraft plate: effect of the composite patch shape on the repair performance. Frattura ed Integrita Struttuarle: 2019: Volume 50, 68-58.
[10] Leonel Echer, Carlos Eduardo de Souza, Rogerio Jose Marczak. A Study on Best Conventional Shapes for Composite repair patches. Material Research: 2021, Volume 24, supply2.

Ground-supported Concrete Tanks under Multiple Earthquakes

Konstantinos VOLIKOS[a], Foteini KONSTANDAKOPOULOU[b], Georgios BALOMENOS [c], George HATZIGEORGIOU[d*]

[a] *Hellenic Open University, SST, Par. Aristotelous 18, Patras,Greece, volikos.konstantinos@ac.eap.gr*
[b] *Hellenic Open University, SST, Par. Aristotelous 18, Patras,Greece, konstantakopoulou.foteini@ac.eap.gr*
[c] *McMaster University, 1280 Main Street West, Hamilton, Canada,, balomeng@mcmaster.ca*
[d] *Hellenic Open University, SST, Par. Aristotelous 18, Patras,Greece, hatzigeorgiou@eap.gr*

Abstract

This paper examines the inelastic behavior of ground-supported circular concrete tanks under the action of multiple earthquakes. The structure support conditions are considered in this study where flexible elastic supports are examined considering soil-structure interaction phenomena. A comparison between single and multiple earthquakes for the behavior and capacity of reinforced concrete tanks is investigated. The finite element method using a homemade finite element program is applied to investigate the inelastic response of circular tanks under seismic time-history analysis. An adequate number of seismic sequences are involved in this paper to achieve trustworthy results and to confirm their validity. It is concluded that multiple earthquakes lead to a more critical response in comparison with single earthquakes.

Keywords: Multiple earthquakes, concrete tanks, inelastic response

1. INTRODUCTION

Reinforced concrete tanks are significant infrastructures in industrial and commercial applications as they are used for the storage of various products such as water, oil, and gas. As a result, liquid storage tanks can be reflected the lifeline of provisional facilities. They appear to be life-threatening components in the urban water resource and firefighting structures and are used widely for storage and/or handling of a variety of liquids or liquid-like resources, including chemical fluids, liquefied natural gas, oil, and wastes of various practices.

Traditional reinforced concrete tanks have been used widely for public, private, and industrial facilities for a number of decades. There are several forms of storage tanks depending on the tank type, construction material, support condition, geometry, etc. Ground-supported tanks can be categorized consistent with tank configuration (circular or rectangular or polygonal), wall support condition (flexible and nonflexible base connections), and method of construction, i.e., reinforced or prestressed concrete. Numerous tanks, mainly cylinder-shaped ones, have been constructed of steel. Nonetheless, concrete tanks including cylinder-shaped ones, are also attractive and popular. This is due to enhanced service life and resilience and also due to several observed catastrophes of steel tanks during previous seismic activity. The design of concrete tanks imposes that consideration is given both to strength and serviceability. As a result, concrete tanks may be used to store hazardous or contaminated materials, while the leakage of such materials can cause damage to the environment with associated costs more than the damage caused by the strong ground motion itself. Moreover, the functionality of concrete tanks is very important

* Corresponding author.

after the occurrence of a strong ground motion to satisfy the critical requests. Consequently, concrete tanks should be designed to satisfy the serviceability provisions as well as the strength requirements. A suitably designed concrete tank should survive under the action of applied loads according to codes' provisions with small crack widths to avoid outflow. The objective of giving an operationally concrete tank that will not outflow is attained by selecting the appropriate quantity and sharing of steel rebars, suitable arrangement and detailing of construction joints, and usage of appropriate concrete grade. Reinforced concrete walls of circular tanks are also exposed to temperature and shrinkage phenomena. Consequently, a proper quantity of steel rebars is essential to eliminate the cracking effects.

There are numerous cases of damage to concrete tanks due to seismic events. It was reported that there was heavy damage to concrete tanks during the earthquakes of Long Beach 1933, Niigata 1964, Alaska 1964, Parkfield 1966, San Fernando 1971, Imperial County 1979, Coalinga 1983, Northridge 1994, Kobe 1995, and 1999 Kocaeli earthquakes. It is worth noticing that, generally, the damage to concrete tanks is different from the damage to steel tanks subjected to strong earthquakes.

The key reasons for the damage to concrete tanks are mostly due to cracks, deformations, and leakage in the tank wall. Additionally, due to strong ground motions, concrete tanks are exposed to rather large hydrodynamic loads for the duration of earthquakes, plus the hydrostatic loads.

The damage to liquid storage tanks can be classified as (see [1-2], amongst others):

- Cracks, deformation, and outflow esoteric the shell
- Spillover of the liquid
- Damage to piping and other types of pieces joined with the concrete tank because of the relative movement of the flexible shell
- Failure to the supporting structure
- Failure to the anchor bolts and/or the foundation system
- Damage to supporting soil due to over-stressing

An additional most important benefit of this study is the emphasis placed on the effect of multiple strong ground motions on the response of concrete tanks. It should be recognized that all the above-mentioned research previous papers have exclusively examined the 'design' earthquake. Consequently, all these investigations are not sufficient for assessing the seismic behavior of concrete tanks under repeated earthquakes. Although the effects of repeated earthquakes on the behavior and capacity have been examined for various systems and structures, the related works have been entirely proposed for single-degree-of-freedom systems [3-6], two- and three-dimensional building structures [7-9], utility tunnels [10] and above-ground steel tanks [2]. To the best of the authors' knowledge, there is not any investigation that has studied the seismic response of concrete tanks under multiple earthquakes, while the necessity for the development of a reliable method to assess the inelastic behavior of these special structures under multiple earthquakes is apparent.

This paper investigates the inelastic response of circular reinforced concrete tanks subjected to single and multiple earthquakes. The inelastic behavior of ground-supported cylindrical concrete tanks using time-history analysis is examined. Maximum deformation, base shear, and permanent deformation involved in this study are also evaluated.

2. DAMAGE MECHANICS MODEL FOR CONCRETE

The materials of the present tank system are concrete for the tank foundation and tank wall. The inelastic response of this quasi-brittle material can be effectively modeled by the theory of elastic-damage mechanics. In this paper, use is made of the FOM isotropic damage model [11], which is capable of simulating all the basic features of concrete behavior, i.e., the different behavior in compression and tension, the degradation of strength and stiffness with deformation leading to softening and deformation localization and the strength increase under 2-D or 3-D stress states. Furthermore, it can also take into account strain rate effects (increase of strength) and cycling effects (permanent strain upon unloading) through empirical relations obtained from real and numerical experiments. As stated by the FOM model, the stress vector $\{\sigma\}$ is computed from

$$\{\sigma\} = (1-d)\{\bar{\sigma}\} = (1-d)[D]\{\varepsilon\} \tag{1}$$

where $[D]$ is the matrix of elasticity, $\{\bar{\sigma}\}$ is the effective stress vector of the elastic material, $\{\varepsilon\}$ is the strain vector, which results from the displacement vector $\{u\}$, and d corresponds to a damage index, i.e., a parameter varying between 0 and 1, for the undamaged and the fully damaged state, respectively. The damage index d is expressed as

$$d = a^{+}d^{+} + a^{-}d^{-} \tag{2}$$

where d^{+} and d^{-} are damage indices in tension and compression, respectively, and a^{+} and a^{-} are functions of the deformation.

The behavior of plain concrete can be modeled by the FOM model using appropriate phenomenological parameters. For more information about this concrete damage model, one can consult [11-12].

3. SEISMIC ANALYSIS OF SOIL-TANK INTERACTION

A typical three-dimensional (3-D) soil-tank system, as shown in Fig. 1, is analyzed here by the finite element method (FEM) for the action of seismic loads. In the following, a X-Y-Z coordinates system is adopted where the X-axis is along the transverse direction, the Y-axis is along the vertical direction and Z-axis is along the tank axis. The soil is assumed to Type-B according to Eurocode 8 and it is bounded by two horizontal physical boundaries, i.e., the rigid bedrock at the bottom and the free soil surface at the top and lateral artificial boundaries. In order to avoid the undesirable reflection of waves at the artificial lateral boundaries of the domain of Fig. 1, viscous absorbing boundaries are applied there. These are improved types of boundaries that proposed by Lysmer and Kuhlemeyer (1969) [11].
Linear hexahedral brick finite elements with eight nodes and three displacement nodal degrees of freedom are used here for the space discretization of the soil-tank system into finite elements, as shown in Fig. 1. Thus, the matrix equation of motion of the discretized system of Fig. 1 can take the form

$$[M]\{\ddot{u}\} + [C]\{\dot{u}\} + \{R\} = \{F\} \tag{3}$$

where $[C]$ and $[M]$ are the damping and mass matrices, respectively, $\{R\} = \{R(u, \dot{u}, \ddot{u})\}$ denotes the internal reaction forces vector, which for the case of linear elastic behaviour takes the form $\{R\} = [K]\{u\}$, where $[K]$ corresponds to the elastic stiffness matrix. Furthermore, $\{u\}$, $\{\dot{u}\}$ and $\{\ddot{u}\}$ are the vectors of displacement, velocity and acceleration, respectively, and $\{F\}$ is the external dynamic loads vector. In this study, the latter vector corresponds to the seismic action $\{F\} = -[M]\{\ddot{u}_g\}$, where $\{\ddot{u}_g\}$ is the vector of acceleration at rigid base and $\{u\}$, $\{\dot{u}\}$ and $\{\ddot{u}\}$ are also relative to the rigid base (i.e., to bedrock). The vector of acceleration $\{\ddot{u}_g\}$ is assumed to be uniform on the base with three components along the x, y and z directions. It should be mentioned that the aforementioned mass matrix [M] takes also into account the effective fluid mass, as described in the next section.

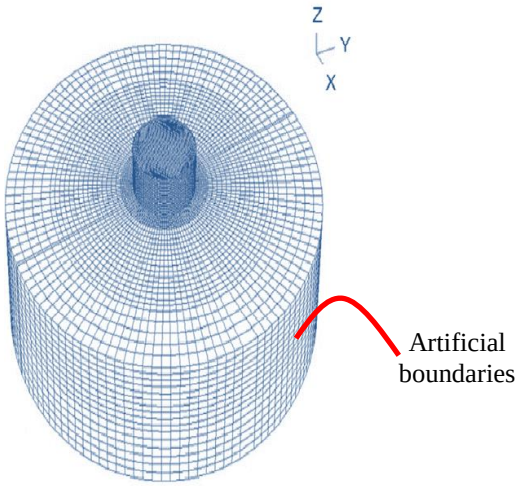


Figure 1. Geometry and discretization of 3-D soil-tank system under triaxial seismic motion

Linear hexahedral brick finite elements with eight nodes and three displacement nodal degrees of freedom are used here for the space discretization of the soil-tank system into finite elements, as shown in Fig. 1. Thus, the matrix equation of motion of the discretized system of Fig. 1 can take the form

$$[M]\{\ddot{u}\}+[C]\{\dot{u}\}+\{R\}=\{F\} \tag{4}$$

where $[C]$ and $[M]$ are the damping and mass matrices, respectively, $\{R\}=\{R(u,\dot{u},\ddot{u})\}$ denotes the internal reaction forces vector, which for the case of linear elastic behaviour takes the form $\{R\}=[K]\{u\}$, where $[K]$ corresponds to the elastic stiffness matrix. Furthermore, $\{u\}$, $\{\dot{u}\}$ and $\{\ddot{u}\}$ are the vectors of displacement, velocity and acceleration, respectively, and $\{F\}$ is the external dynamic loads vector. In this study, the latter vector corresponds to the seismic action $\{F\}=-[M]\{\ddot{u}_g\}$, where $\{\ddot{u}_g\}$ is the vector of acceleration at rigid base and $\{u\}$, $\{\dot{u}\}$ and $\{\ddot{u}\}$ are also relative to the rigid base (i.e., to bedrock). The vector of acceleration $\{\ddot{u}_g\}$ is assumed to be uniform on the base with three components along the x, y and z directions. It should be mentioned that the aforementioned mass matrix $[M]$ takes also into account the effective fluid mass, as described in the next section.

The solution of Eq. (4) is obtained numerically in the discretized time domain by stepwise time integration. Here, the constant (average) acceleration scheme of Newmark is used in association with the modified Newton-Raphson iterative scheme at every time step Δt. For a detailed flow-chart of the above time integration procedure, one can look at Konstandakopoulou et al. [10]. For the selection of the appropriate time step Δt one can consult the aforementioned study. The finite element computer program SINUS (Seismic INelastic analysis of Underground Structures) [12], developed on the basis of the aforementioned finite element solution procedure, is used in this work to determine the seismic response of the soil-tank system of Fig. 1. 4. Seismic analysis of fluid-structure system.

In problems of dynamic fluid-structure interaction involving liquid storage tanks and intake water towers, the fluid is of finite extend because it is inside the structure. The fluid is assumed to be non-viscous and irrotational and either incompressible or compressible. When the fluid is incompressible, the governing equation of its motion is Laplace's equation for its velocity potential, while if it is compressible, its governing equation of motion is the acoustic wave equation for its pressure.

In many applications, the actions of the fluid on the structure is taken approximately into account by the added mass technique, first used by Westergaard to determine the hydrodynamic pressures on rigid dams due to horizontal seismic motions. This added mass on the structure represents that part of the total mass of the fluid that participates with the structure in its motion and can be determined by using the incompressible fluid model. The problem of determining that mass presents some difficulties when the structure is surrounded by an infinitely extended fluid, as in the case of outlet water towers or dams, or in cylinders partially filled with fluid, as in the case of partially filled storage tanks. In case the cylinder is a long one and is completely filled with fluid, its added mass per unit length is the total mass per unit length for any seismic motion (transverse, vertical or axial).

The added mass technique is used in this work due to its simplicity and high accuracy with respect to structural responses. This is because concrete tanks like the ones considered here, are analyzed for seismic loads either empty or completely filled with water. When the tank is completely filled with water, the added mass is the total inside mass and the only problem is its distribution at the structural nodes in contact with the water, which is different for the three directions of seismic motion along the X-, Y- and Z-axes of the tank as shown in Fig. 2. The mass distribution depends on influence surfaces created for every node and direction of motion. For example, the added mass m_X at node 7, common to elements 13 and 14 as shown in Fig. 2, is obtained by adding the masses corresponding to the surfaces *a*-*b*-*c*-7 and 7-*c*-*d*-*e*. In a similar way, one can obtain the mass m_Y at node 7. The mass m_Z at node 7 is obtained by the contribution of the shaded circular sector, as shown in Fig. 2.

At this point it should be emphasized that using the added mass technique one takes into account only the influence of the fluid on the response of the structure (liner and surrounding rock), i.e., he does not have a complete fluid-structure interaction. Furthermore, it should be mentioned here that a correct application of the added mass technique also requires the use of an appropriate value of viscous damping for the fluid-structure system. The critical damping ratio ξ_o of the system can be computed from the relation

$$\xi_o = \frac{\omega_o}{\omega}\xi \tag{4}$$

where ω_o and ω are the fundamental circular frequencies of the system and the structure, respectively, and ξ is the critical damping ratio of the structure. Assuming mass proportional damping matrix of the form

$$[C] = a[M] \tag{5}$$

for reasons of simplicity and efficiency, one has that

$$a = 2\xi\omega \tag{6}$$

Thus, combining Eqs (5) and (6), one has for the fluid-structure system

$$a_o = 2\frac{\omega_o^2}{\omega}\xi \tag{7}$$

One can observe that, since the mass of the system is larger than that of the structure, while the stiffness of the system remains the same with that of the structure, $\omega_o < \omega$ and hence from Eqs (4) and (7) he has $\xi_o < \xi$ and $a_o < a$.

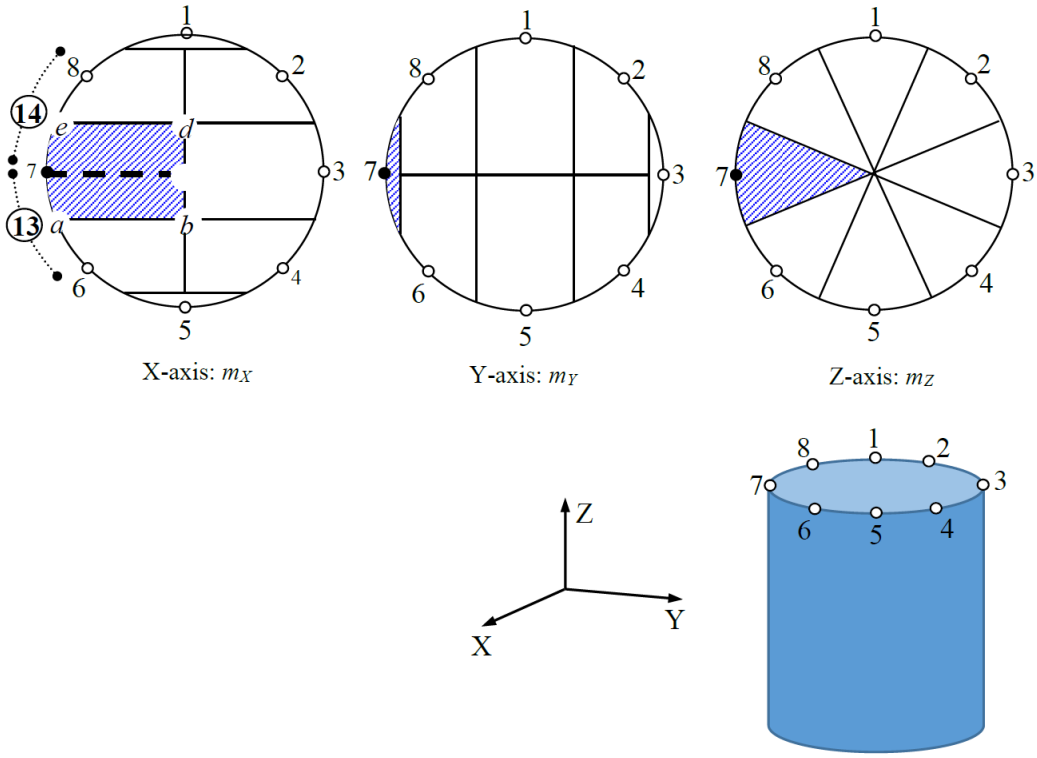


Figure 2. Distribution of added mass at structural nodes of fluid-structure interface

4. SEISMIC INPUT

The strong ground motion database that has been used here consists of five real seismic sequences, which have been recorded during a short period of time (up to three days), by the same station, in the same direction, and almost at the same fault distance. These seismic sequences are namely:

- Mammoth Lakes (May 1980 - 5 events),
- Chalfant Valley (July 1986 - 2 events),
- Coalinga (July 1983 - 2 events),
- Imperial Valley (October 1979 - 2 events), and
- Whittier Narrows (October 1987 - 2 events) earthquakes.

The complete list of these earthquakes, appears in Table 1.

Table 1. Seismic input data

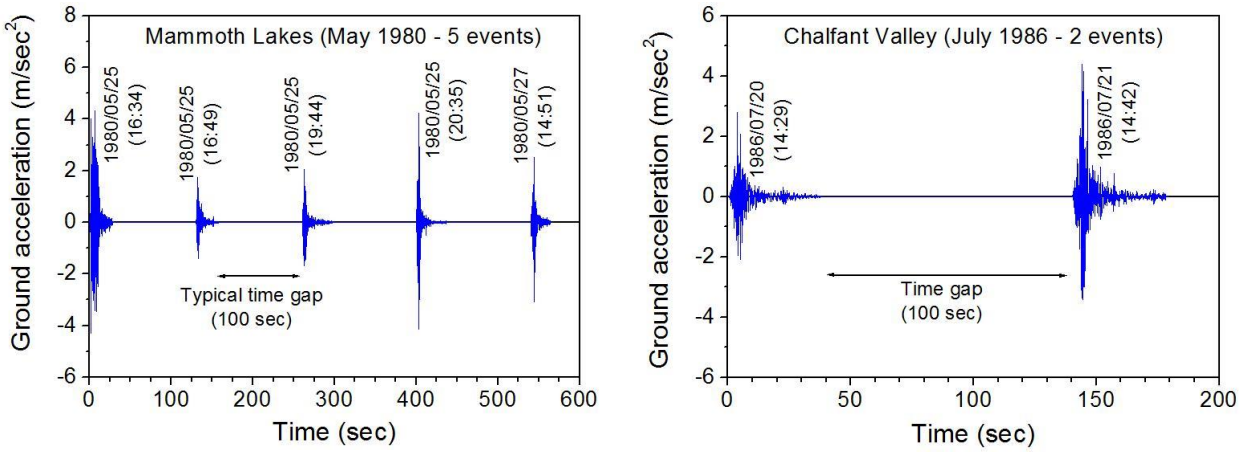
No.	Seismic sequence	Station	Comp.	Date (Time)	Magnitude (M_L)	Recorded PGA(g)	Normalized PGA(g)
1	Mammoth Lakes	54099 Convict Creek	N-S	1980/05/25 (16:34)	6.1	0.442	0.200
				1980/05/25 (16:49)	6.0	0.178	0.081
				1980/05/25 (19:44)	6.1	0.208	0.094
				1980/05/25 (20:35)	5.7	0.432	0.195
				1980/05/27 (14:51)	6.2	0.316	0.143

2	Chalfant Valley	54428 Zack Brothers Ranch	E-W	1986/07/20 (14:29)	5.9	0.285	0.128
				1986/07/21 (14:42)	6.3	0.447	0.200
3	Coalinga	46T04 CHP	N-S	1983/07/22 (02:39)	6.0	0.605	0.165
				1983/07/25 (22:31)	5.3	0.733	0.200
4	Imperial Valley	5055 Holtville P.O.	HPV315	1979/10/15 (23:16)	6.6	0.221	0.200
				1979/10/15 (23:19)	5.2	0.211	0.191
5	Whittier Narrows	24401 San Marino	N-S	1987/10/01 (14:42)	5.9	0.204	0.192
				1987/10/04 (10:59)	5.3	0.212	0.200

These records are compatible with the soil class B, and therefore compatible with the design process as mentioned in Section 3. Figure 3 shows the time histories of the ground acceleration where between two consecutive seismic events a time gap is applied, which is equal to 100 sec. This gap is absolutely enough to cease the moving of any structure due to damping, taking into account that water has very small inherent damping, about 0.5% of critical damping ratio.

For compatibility reasons with the design process the seismic sequences are normalized to have maximum *PGA* equal to 0.2g (Table II, right column). Thus, the abovementioned sequential ground motions are multiplied by:

- 0.4525 (Mammoth Lakes),
- 0.4474 (Chalfant Valley),
- 0.2729 (Coalinga),
- 0.9050 (Imperial Valley) and
- 0.9434 (Whittier Narrows).



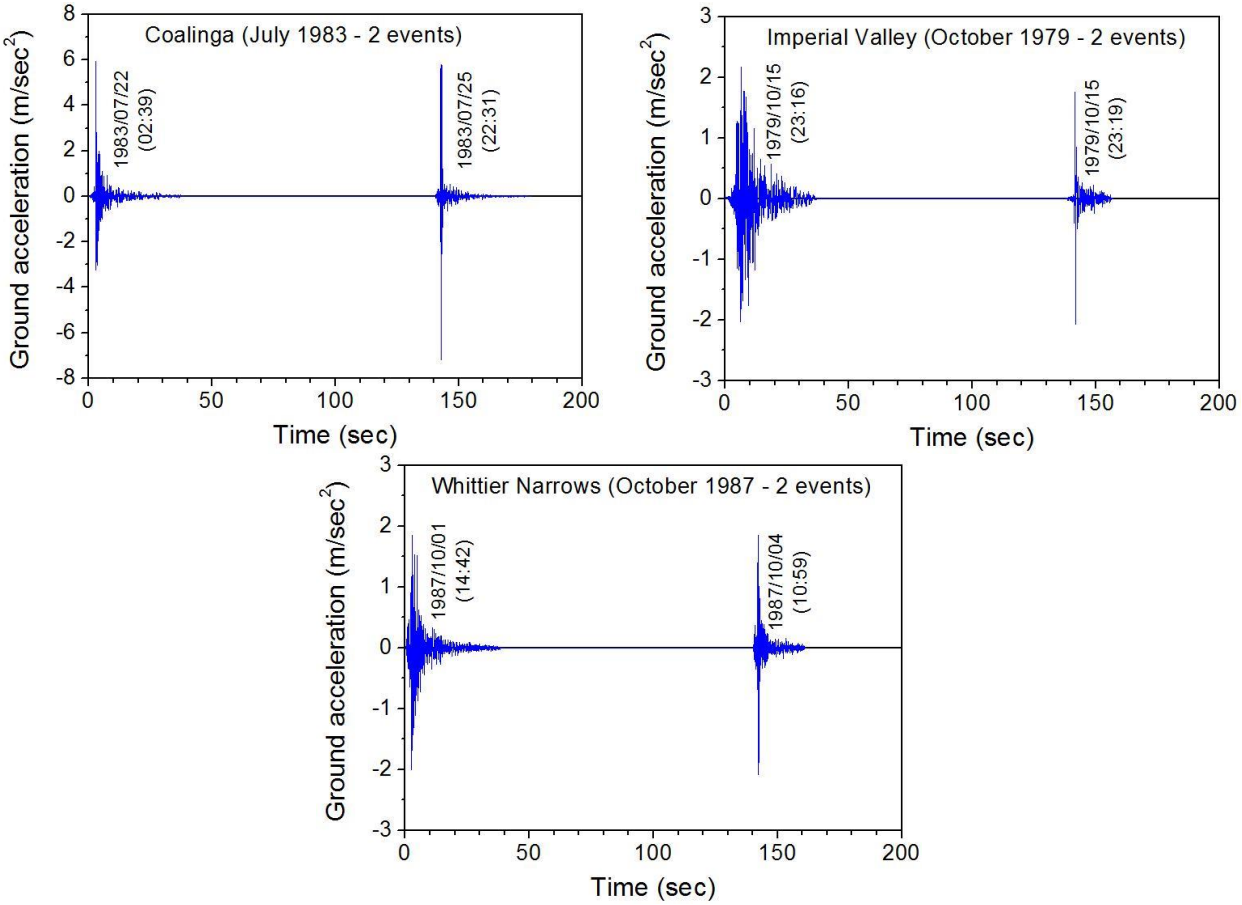


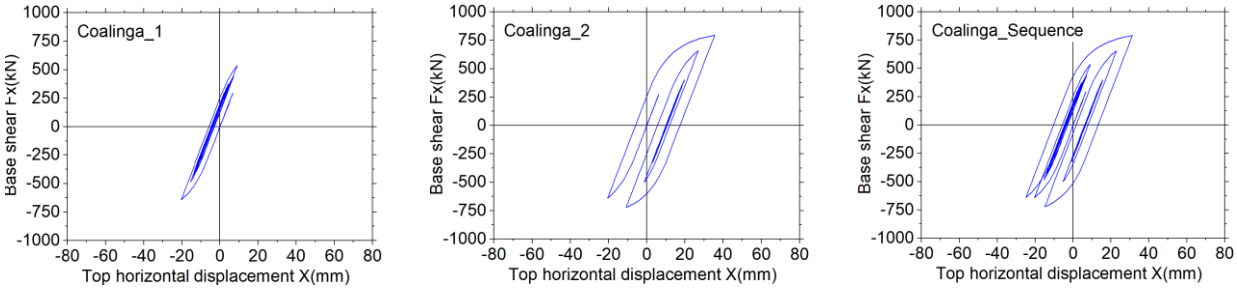
Figure 3. Ground acceleration records of the examined seismic sequences

For compatibility reasons with the design process the seismic sequences are normalized to have maximum *PGA* equal to 0.2g (Table II, right column). Thus, the abovementioned sequential ground motions are multiplied by:

- 0.4525 (Mammoth Lakes),
- 0.4474 (Chalfant Valley),
- 0.2729 (Coalinga),
- 0.9050 (Imperial Valley) and
- 0.9434 (Whittier Narrows).

5. SELECTED RESULTS

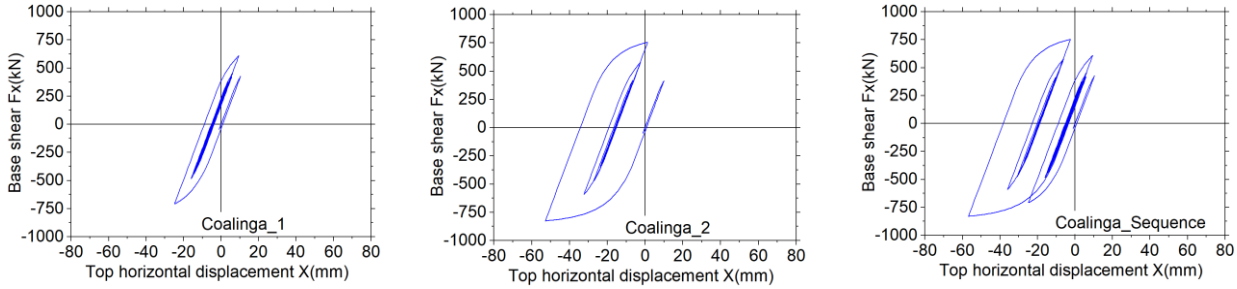
The inelastic behaviour of the examined RC tanks, which are subjected to the aforesaid five real seismic sequences, is investigated in this section. This study focuses on the following basic design parameters: local or global damage index, maximum horizontal displacements and acceleration. Finally, the development of permanent displacements is also investigated. Thus, Fig. 4 depicts the base shear – top displacement in X-direction for the examined tank, assuming 50% fullness of tank with water, under the action of Coalinga earthquakes, i.e., both for single earthquakes and seismic sequence, as well as the total (global) damage index for the concrete tank.



D=4.1% D=19.3% D=22.1%

Figure 4. Base shear – top displacement response in X-direction for 50% fullness of tank with water. Coalinga earthquakes

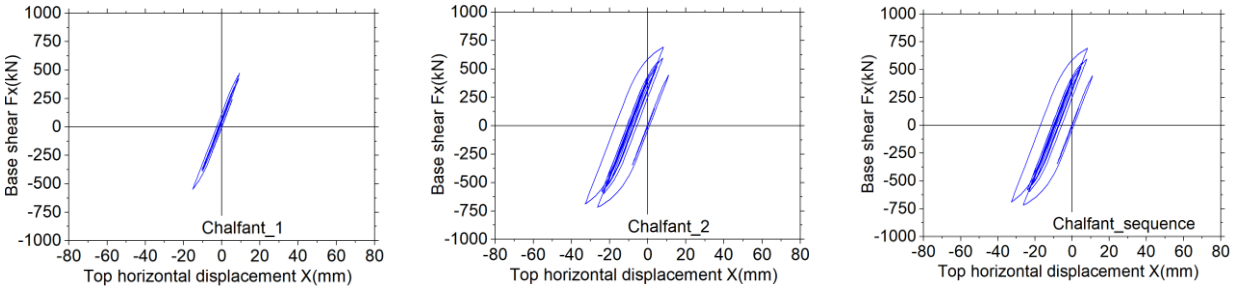
Similarly, Fig. 5 shows the base shear – top displacement in X-direction for the examined tank, assuming 100% fullness of tank with water, under the action of Coalinga earthquakes, i.e., both for single earthquakes and seismic sequence, as well as the total (global) damage index for the concrete tank.



D=7.4% D=26.1% D=31.5%

Figure 5. Base shear – top displacement response in X-direction for 100% fullness of tank with water. Coalinga earthquakes

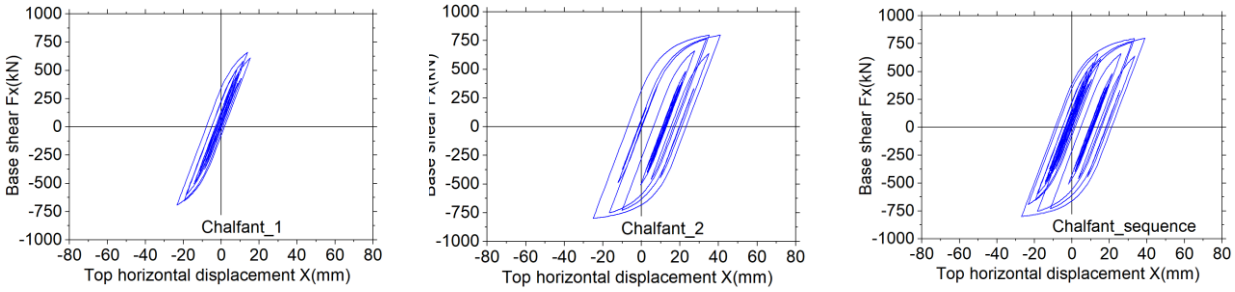
Additionally, Fig. 6 depicts the base shear – top displacement in X-direction for the examined tank, assuming 50% fullness of tank with water, under the action of Chalfant earthquakes, i.e., both for single earthquakes and seismic sequence, as well as the total (global) damage index for the concrete tank.



D=3.5% D=16.6% D=18.0%

Figure 6. Base shear – top displacement response in X-direction for 50% fullness of tank with water. Chalfant earthquakes

In the same way, Fig. 7 shows the base shear – top displacement in X-direction for the examined tank, assuming 100% fullness of tank with water, under the action of Chalfant earthquakes, i.e., both for single earthquakes and seismic sequence, as well as the total (global) damage index for the concrete tank.



D=8.9% D=29.2% D=36.4%

Figure 7. Base shear – top displacement response in X-direction for 100% fullness of tank with water. Chalfant earthquakes

Table 2 shows results (damage indices and residual/permanent displacements) for the examined set of seismic sequences, bot for 50% and 100% fullness of tank with water.

Table 2. Concrete tank under multiple earthquakes. Selected results

Earthquake	Record	50% fullness with water		100% fullness with water	
		Damage index (%)	Perm. disp (mm)	Damage index (%)	Perm. disp (mm)
Mammoth Lakes	MA1	19.5	22.1	36.2	34.5
	MA2	3.2	4.2	7.1	6.8
	MA3	5.7	5.7	7.8	7.9
	MA4	18.4	19.6	29.5	29.3
	MA5	20.1	21,1	33.1	34.9
	Sequence	32.8	24,9	44.5	38.1
Chalfant Valley	CH1	3.5	3.7	8.9	4.4
	CH2	16.6	18.2	29.2	19.5
	Sequence	18.0	19.8	36.4	20.4
Coalinga	CO1	4.1	6.7	7.4	7.8
	CO2	19.3	12.4	26.1	23.3
	Sequence	22.1	13.1	31.5	24.1
Imperial Valley	IM1	18.2	11.3	25.0	22.2
	IM2	7.2	8.8	9.5	9.9
	Sequence	21.6	12.6	31.0	23.6
Whittier Narrows	WI1	17.5	18.1	24.2	22.5
	WI2	13.2	12.2	17.1	16.8
	Sequence	22.8	20,9	29.5	28.1

It is obvious that multiple earthquakes strongly affect the structural parameters, such as damage index and permanent displacements where their values appear to be larger than the corresponding maximum values for single ground motions.

6. CONCLUSIONS

This paper examined, for the first time, the inelastic behaviour of concrete tanks under under sequential strong ground motions. A detailed study of the problem leads to the following conclusions:

- Multiple earthquakes lead to increased displacement demands in comparison with single seismic events.
- The seismic damage for multiple earthquakes is higher than that for single ground motions.
- The traditional seismic design procedures, which are essentially based on the isolated ‘design earthquake’, should be reconsidered since the multiple earthquakes phenomenon cannot be ignored.
- The level of fullness of the tank with water (or other fluids) strongly affects their seismic response.

Acknowledgements

Mr. Volikos and Prof. Hatzigeorgiou gratefully acknowledge the financial support of Hellenic Open University - Project 80248.

References

[1] Minoglou, M. K., Hatzigeorgiou, G. D., & Papagiannopoulos, G. A. (2013). Heuristic optimization of cylindrical thin-walled steel tanks under seismic loads. Thin-Walled Structures, 64, 50-59.
[2] Konstandakopoulou, F. D., & Hatzigeorgiou, G. D. (2017). Water and wastewater steel tanks under multiple earthquakes. Soil Dynamics and Earthquake Engineering, 100, 445-453.
[3] Hatzigeorgiou GD, Beskos DE. (2009) Inelastic displacement ratios for SDOF structures subjected to repeated earthquakes. Eng Struct;31(11):2744–55.
[4] Hatzigeorgiou, G. D. (2010a). Ductility demands control under repeated earthquakes using appropriate force reduction factors. Journal of Earthquake and Tsunami, 4(03), 231-250.
[5] Hatzigeorgiou GD. (2010b). Ductility demand spectra for multiple near-and far-fault earth- quakes. Soil Dyn Earthq Eng;30(4):170–83.
[6] Hatzigeorgiou GD. (2010c). Behavior factors for nonlinear structures subjected to multiple near-fault earthquakes. Comput Struct;88(5):309–21.
[7] Hatzigeorgiou GD, Liolios AA. (2010) Nonlinear behaviour of RC frames under repeated strong ground motions. Soil Dyn Earthq Eng 2010;30(10):1010–25.
[8] Loulelis D, Hatzigeorgiou GD, Beskos DE. (2012) Moment resisting steel frames under re- peated earthquakes. Earthq Struct;3(3–4):231–48.
[9] Hatzivassiliou M, Hatzigeorgiou GD. (2015) Seismic sequence effects on three-dimensional reinforced concrete buildings. Soil Dyn Earthq Eng;72:77–88.
[10] Konstandakopoulou, F. D., Beskou, N. D., & Hatzigeorgiou, G. D. (2021). Three-dimensional nonlinear response of utility tanks under single and multiple earthquakes. Soil Dynamics and Earthquake Engineering, 143, 106607.
[11] Hatzigeorgiou G, Beskos D, Theodorakopoulos D, Sfakianakis M. (2001) A simple concrete damage model for dynamic FEM applications. International Journal of Computational Engineering Science 2: 267-286.
[12] Hatzigeorgiou GD, Beskos DE. (2014) SINUS: Seismic inelastic analysis of underground structures computer program. Version 3.0. Hellenic Open University, Patras, Greece. Lysmer J, Kuhlemeyer RL. (1969) Finite dynamic model for infinite media. Journal of the Engineering Mechanics Division (ASCE); 95(4): 859–877. Lysmer J, Kuhlemeyer RL. (1969) Finite dynamic model for infinite media. Journal of the Engineering Mechanics Division (ASCE); 95(4): 859–877.

CIAE
Czech Institute of Academic Education z.s.

Title:

"Proceedings of IAC 2022 in Vienna", ISBN 978-80-88203-28-5

August 2022 in Prague, *1st edition*

Publisher / Creator of CD / Copyright holder:

Czech Institute of Academic Education z.s.

Address of Publisher:

Vodnicka 309/20, 149 00 - Prague 4, Czech Republic

Email: info@conferences-scientific.cz

Web: www.conferences-scientific.cz

ISBN 978-80-88203-28-5

Czech Institute of Academic Education z.s.