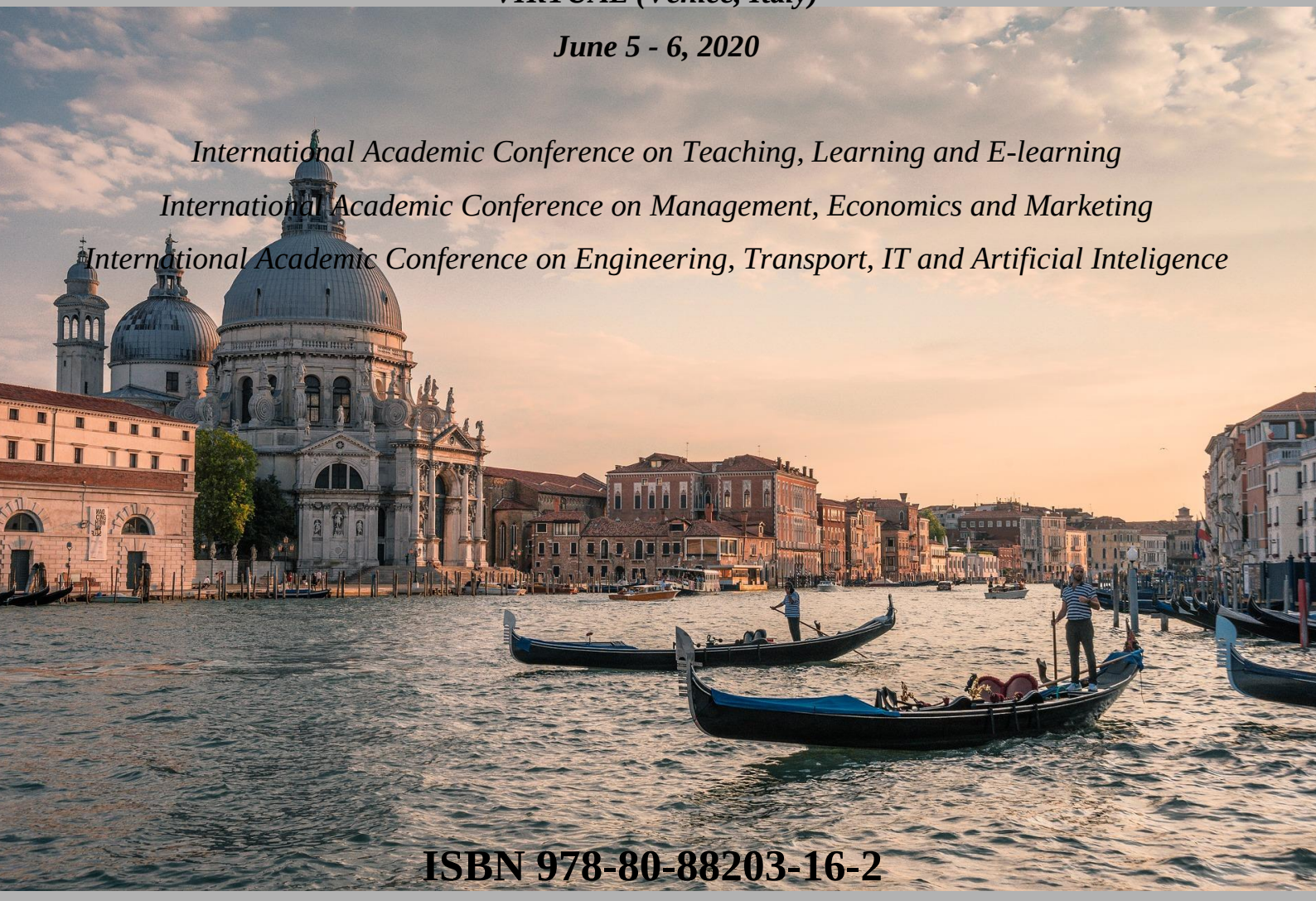
Proceedings of IAC 2020 in Venice

VIRTUAL (Venice, Italy)

June 5 - 6, 2020



International Academic Conference on Teaching, Learning and E-learning

International Academic Conference on Management, Economics and Marketing

International Academic Conference on Engineering, Transport, IT and Artificial Inteligence

ISBN 978-80-88203-16-2

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"Proceedings of IAC 2020 in Venice", ISBN 978-80-88203-16-2

Červen 2020 v Praze, *První vydání*

Vydavatel / Tvůrce CD / Nositel autorských práv:

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Title:

"Proceedings of IAC 2020 in Venice", ISBN 978-80-88203-16-2

June 2020 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

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Teaching, Learning and E-learning
(IAC-TLEl 2020)

Examining Predictors of Affective Affective Awareness towards Instruction

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Abstract

It is a research on the affective affective awareness towards Instruction, which is an innovative and important element in educational research. Therefore, it was aimed to reveal how the affective affective awareness in teaching can be explained by different variables in the research. The study group of the research consists of 243 university students studying in the city of Istanbul in the 2019-2020 academic year. The method of the research is quantitative and has been developed using a causal survey approach. Research path analysis and logistic regression analysis were done. Students' affective affective awareness in teaching, test anxiety, end-of-year (GPA), grade level, university scholarship rate and studied per day were examined. The findings of the study revealed that the affective affective awareness of the variable teaching, which had not been previously examined by the path analysis, were explained by different variables at the rate of 8%. According to logistic regression analysis, the predictive variable of GPA score is predicted by affective affective awareness, classroom level and university scholarship (CHI / df = 3.63).

Keywords: affective affective awareness, test anxiety, GPA score

1. INTRODUCTION

It also has great value in building a foundation for *affective affective awareness* and learning.

Separate research questions were asked for exogenous and endogenous variables. The following question is addressed for endogenous variables:

• Whether the affective differences in teaching are predicted by different variables

The following question is proposed for exogenous soil variables:

• Whether it is predicted by affective differences, class level and university scholarships for predictive variable teaching, GPA score,

1.1. Structure

In this study, it was attempted to determine a causal situation by examining the emotional differences of university students' test anxiety, gender, class, GPA, scholarship, study time in the context of path analysis. With this aim in

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mind, a model that reveals variables that explain the affective affective awareness of university students about learning has been developed. A causal pattern was used in the study to determine the extent to which different variables affect the affective affective awareness of university students towards learning. Causal pattern is a research approach that has arisen between some variables or examines the cause-effect relationships that exist (Karasar, 2013). The causal pattern is used when there is a cause-effect relationship in the relationship between variables.

2. Study group

The study group of this research consists of students who have received education in the Faculty of Education at Vakıf University in Istanbul in 2019-2020 academic year. The sample group in the study was selected according to the simple random sampling technique, which is the random sampling technique. According to this technique, all units have equal chances in selection, all units are listed in the application and are created by selecting random units from the list (Kılıç, 2013).
The students in the study group consist of 697 students enrolled in the Classroom Teaching Program of these universities and Eskişehir Osmangazi University Guidance and Psychological Counseling Program and attending the classes the week of the application. After the scale of 16 of the students participating in the application was deemed invalid and removed, the scale of 681 students in total was accepted as valid.

Individuals participating in the study group are 2nd grade students with a maximum rate of 31.7% and 1st grade students with a minimum rate of 20.2%. When the comparison is made according to the students' AGO scores, the maximum is within the range of 2.51-3.00 at the rate of 46.5%, and at least the 2.00-2.50 at the rate of 10.7%. When analyzed according to the scholarship rate, students with a maximum of 41.2% semi-scholarship and a minimum of 9.9% with 75% scholarship. Finally, the daily study time was examined, with less than 1 hour of study time at 29.6% and less than 4 hours of study at least 5.3%.

2.1. Data collection tool

The Scale of Affective Affective awareness towards Instruction) developed by Duman and Yakar (2017)
Affective affective awareness is the affective awareness of the inner life of individuals and create affective awareness for others and the environment. This scale was developed to assist in creating the basis for achieving affective goals in education. The scale was developed to reveal the affective affective awareness levels of university students regarding the teaching of any course. It was developed as a measurement tool based on the principle that the participants provided information about themselves. This scale consists of 37 items and there are no inverse items. The scale is a 5-point Likert type and these grades are “not suitable for me at all = 1”, “not suitable for me = 2”, “suitable for me = 3”, “suitable for me = 4”, “completely suitable for me = 5” It was formed. The Cronbach Alpha internal consistency coefficient, which is the result of the test splitting method for the entire scale, was found to be 0.82. In the scale validity analysis, Exploratory factor analysis and then confirmatory factor analysis were performed. In Basic Components Analysis, Kaiser-Meyer-Olkin (KMO) value, 873 and Bartlett test were found to be significant (4979,638, sd = 666, p =, 000). When the fit indices of the Affective Affective awareness Scale for Teaching are examined, AGFI:, 89 (within the acceptable range); GFI:, 91 (within the perfect fit range); CFI: 96 (within acceptable range); RMSEA: 074 (within the acceptable range); SRMR:, 053 (within the acceptable range) values were calculated and these compliance values were found to be sufficient and significant (Duman & Yakar 2017).

Test anxiety scale developed by Bahçeci (2006)

Test anxiety Evaluation Scale consists of 34 items at the end of factor analysis. The item pool of the scale was created by taking 50 anxiety sentences developed by Baltaş (1999) within the permission. The scale's internal consistency coefficient was calculated as (α) = 0.87. The scale is of Likert type and does not contain any inverse

materials. Grades on the scale are (1) never, (2) rarely, (3) sometimes, (4) often and (5) always. 34-78 points in the scale: Low Anxiety; 79-125 points: Moderate Anxiety; 126-170 points: classified as High Level of Anxiety.

2.2. Collecting data

In the collection of the data in the research, the students completed the online environment by filling out an online questionnaire on their mobile phones, and for some, the scales were applied to the students who were included in the study group by the researcher within a period of approximately three weeks. Data were collected on the scales filled by 355 students who came to the course on the week of application. Then the invalid ones were removed and a total of 243 scales were considered valid.

2.3. Analysis and Interpretation of Data

The data obtained from the data collection tool were analyzed through SPSS 22.00 and AMOS programs. Path analysis analysis, which was created to determine the direct or indirect effect of university students' test anxiety, gender, class, GPA, scholarship, study time on their affective differences towards teaching, was conducted.

3. Results

Path Analysis Findings related to the effect of university students on test anxiety, class, GPA, scholarship, study time affective differences on teaching are presented in Figure 1.

Research Hypothesis: Affective differences in teaching are predicted by variables of test anxiety, class, GPA, scholarship, study time.

The path analysis examines the relationship between two or more variables. AMOS was used to determine the relationship pattern between test anxiety and affective affective awareness. The model developed based on the hypotheses of the research has been revealed with path analysis. The degree of freedom of the model was found to be 3, and the chi-square value was small and insignificant ($\chi^2 = 3.206$, p-value = 0.361). In addition, the values obtained from auxiliary fit indices turned out to be within acceptable limits ($\chi^2 / df = 1.069$, GFI = .99, NFI = .96, CFI = .99, RMSEA = .02). These results indicate that the model is compatible with the data and also reveals that the model is acceptable. According to the findings, Path coefficients, which showed the direct effect of university students' test anxiety, gender, class, GPA, scholarship, study time on teaching affective differences, were found statistically significant.

Affective differences in teaching explain 8% of the change and 4% of the change in test anxiety. All paths defined in the model were found to be significant. Accordingly, affective differences in teaching, test anxiety ($\beta = .09$., $P < .01$) and Class ($\beta = -.02$, $p < .05$) negatively, GPA ($\beta = .10$, $p < .01$) positively, scholarship ($\beta = .13$, $p < .01$) positively and studied per day ($\beta = .21$, $p < .01$) positively. In addition, students' test anxiety, Class ($\beta = .07$, $p < .05$) positive, GPA ($\beta = -.14$, $p < .01$) negative, scholarship ($\beta = .01$, $p < .01$) positive and studied per day ($\beta = .17$, $p < .01$) positively.

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Perception of the Usefulness of Augmented Reality in Physical Education Teachers' Initial Training

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Abstract

Augmented reality is a technology that has made its way to the educational field as another methodological resource. In this experience, we present the opinion of 61 students of the Degree of Teacher Training in Primary Education (University of Zaragoza, Spain) of employing this ICT tool. It has been used as an auxiliary resource during some practical sessions of the optional Physical activities in the natural environment subject. Students completed a practice diary that focused on two points of interest: firstly, their own experience when using these applications; secondly, the transfer that they considered these applications could have in their future teaching action. The results show that using augmented reality not only arouses emotions of fun and pleasure, but also feelings of considerable usefulness. Students especially highlighted the fact that it allows greater dynamism during sessions, and it even favouring the emergence of interdisciplinary work. Finally, contextual factors were pointed out as the main limiting factors for its future transferability, whose main reasons were lack of mobile devices, or even children's reluctance to use them at school.

Keywords: ICT, teaching, usefulness, transferability

1. INTRODUCTION

1.1. Digital competence in the Education context

Currently, information and communication technologies (ICT) are growing so fast that they surpass the possible pedagogical approach that teachers can implement in classrooms, and have even been incorporated into school classrooms by students themselves for leisure or functional purposes (Cabero, Barroso & Llorente, 2010).

The educational legislation currently in force in the Spanish system explicitly refers to the need to disclose and also teach students to handle different computer applications to process information. Thus the Primary Education (PrE) curriculum defines digital competence (DC) as one involving the creative, critical and safe use of ICT to fulfill objectives related to work, employability, learning, use of free time, inclusion and participation in society.

The aim of this competence is, among others, for students to be able to create content and solve problems in both formal and informal contexts by taking an active, critical and realistic attitude toward new technologies. In this way, DC also contributes to PrE students acquiring autonomy.

Therefore, it is necessary to study the curricular possibilities that different existing digital resources have by investigating their pedagogical vision (Castrolemus & Gómez, 2015; Corrales, 2009). However, DC is barely

* Corresponding author.

mentioned in the current Physical Education (PE) curriculum for this education stage as it only appears in years 5 and 6 (Peñarrubia, Falcón, Pradas & Rapún, 2018). Furthermore, its implementation is limited to the tasks of searching for information and presenting classroom work and, therefore, overlooks the above-mentioned content creation (Table 1).

Table 1. The assessment of digital competence in Primary Education in the Physical Education area

Course	Evaluation criterion	Key competence	Learning standard	Key competence
5th	Cri.PE.6.12. Extract and elaborate information related to topics of interest in the stage (activities, projects, visits, experiences, etc.) and share it, using specific information sources and making use of information and communication technologies as a support resource for the area.	DC LP	Est.PE.6.12.1. Uses, in some of the tasks entrusted, the information and communication technologies to locate and extract the information requested.	DC
6th	Cri.PE.6.12. Extract and elaborate information related to topics of interest in the stage (activities, projects, visits, experiences, etc.) and share it, using specific information sources and making use of information and communication technologies as a support resource for the area to generate knowledge related to participation in physical activity on a regular basis.	DC LCC SIE	Est.PE.6.12.1. Uses information and communication technologies to locate and extract the requested information.	DC

Note: DG, digital competence; LCC, linguistic communication competence; SIE, sense of initiative and entrepreneurship

1.2. Augmented reality as a resource to perform digital competence

Augmented reality (AR) can be understood as a technology that allows digital information to be added in real time physical information taken from the real world by using a device (Azuma, 1997; De Pedros, 2011). This requires four different elements (Cabero & Barroso, 2016): hardware, software, Internet connection and indicators or triggers. The last element can be either images or QR codes in which virtual information has been entered to then be reproduced with different software packages. According to previous studies (Estebanell, Ferrés, Cornellá & Codina, 2012; Fombona, Pascual & Madeira, 2012; Prendes, 2015), there are different levels of AR, starting from simple markers (level 0, with QR codes) and level 1, with markers such as text, video or audio together with images, followed by the incoporayion of geolocation (level 2) and, finally, virtual-reality-specialized hardware and software (level 3).

The foundation of learning with mobile devices, m-learning, is to approach the work conducted in classrooms to real life, and vice versa, which offers students a more complete learning experience (Fernández, Herrera & Navarro, 2015). Indeed finding AR experiences in the education field (EF) is becoming increasingly common (Cabero, Barroso & Llorente, 2010; Prat, Camerino & Coiduras, 2013). So it would seem reasonable to incorporate e-competencies (Villanueva & Casas, 2010) into teacher training given the growing interest in introducing Technologies for Learning and Knowledge (TLK) as a pedagogical tool in the EF (Prat & Camerino, 2012; Quintas, Castellar & Pradas, 2017; Quintas, Pradas, Rapún & Castellar, 2016). There is evidence for different advantages or benefits associated with using AR as a methodological resource. The most prominent one in the literature (Cabero & Barroso, 2016; García & Ramos, 2016, among others) is the motivation it generates toward learning. In fact Fombona & Pascual (2017) found a direct association between this motivation and better academic performance. Similarly, there are other experiences in which AR plays an integrating role in classrooms by favoring the inclusion of students with different individual realities (Martín-Sabarís & Brossy-Scaringi, 2017; Laínez, Chocarro de Luis, Busto & López, 2018).

Moreover, the various limitations that currently compromise the use of AR in classrooms have also been published, e.g., network connectivity problems (Kim, Chun & Lee, 2014; San Pedro, Villalustre & Herrero, 2019) or the complexity of applications depending on the education stage they are being used in (Leiva & Moreno, 2015), may appear.

1.3. 1.3. Physical activities in the natural environment as an educational content

Physical activities in the natural environment (PANE) are one of the learning contents or action domains that constitute the curricular framework of the PE subject in PrE. By taking the minimum teaching decree of the

Autonomous Community in which the experience herein presented has been carried out as a reference, these practices are defined as follows:

> The basic actions of this block (with or without materials) are performed in the natural environment or somewhere similar, which may present different levels of uncertainty and are more or less conditioned, coded or marked. The relation between students and the natural environment usually entails total involvement and commitment, which can lead to a heavy emotional burden. This block includes all the situations that imply uncertainty emerging from the environment, regardless of students facing them on their own, collaborating with other participants, or facing individual or group opposition. It is decisive to encode information about the conditions of the environment to situate oneself, to prioritize security over risk, and to regulate the intensity of efforts according to personal possibilities. These activities facilitate the connection with other curricula areas and allow to examine the in-depth values related to environmental conservation, mainly the natural environment. Hiking, nordic walking, mountain bike routes, using greenways, camping, orienteering activities, big games in nature, activities in snow, climbing, and combinations of all these, form part, among others, of the activities in this block. (Resolución de 12 de abril de 2016, Anexo II, Área de EF, p.2.).

We can infer from the previous statement that uncertainty in the practice environment, and a posed risk, are essential characteristics that often hinder development at school (Peñarrubia, Guillén & Lapetra, 2016). However, the educational value of these activities has been proven in the multitude of experiences found in the literature, which has led teachers to consider different alternatives and implement them. One of these is AR, whose usage, which varies from QR codes (Castro & Gómez, 2016; Izquierdo, 2013; Gallego-Lema; Muñoz Cristóbal; Arribas-Cubero & Rubia-Avi, 2017) to geolocation (Pérez & Pérez, 2012), has been documented in previous studies.

1.4. 1.4. Previous PANE and AR experiences in PE teachers' initial training

The research group to which the authors of this experience belong has done different research projects that have focused on using AR in initial teacher training. This is justified by a general competence being found in the curricula of the Teaching Degree in PrE that is related to the use of technologies as an educational resource: To know and apply in classrooms ICT as an added value to guided and autonomous teaching-learning activities. Selectively discern audiovisual information that contributes to learning, civic training and cultural richness.

All the studies (Castellar, Pradas, Quintas & Peñarrubia, 2018; Peñarrubia, Quintas, Castellar & Pradas, 2017; Peñarrubia, Quintas, Rapún & Falcón, 2018; Quintas, Peñarrubia, Castellar & Pradas, 2017) were based on quantitative designs. The following general results were found:

- All the students claim they understand the AR-based methodology. However, 8.6% of them only know how to use QR code reading applications.
- 75.86% of future teachers claim that their use is compatible with PE content in the PrE stage.
- 65.2% of those surveyed state that using ICT in classrooms increases student motivation and student engagement during sessions, both theoretically and practically.
- The most important limitations are those related to the necessary hardware (many devices are needed, their battery life, blockages, etc.) and the Internet network range. However, it is also considered that AR favours approaching remote environments to classrooms. For this reason, AR is proposed as a suitable work option in the PANE block in education centers to which travelling is difficult.

As previously mentioned, these results were obtained through quantitative designs using closed questionnaires as the data collection tool. Bearing this in mind, our work objective was to qualitatively analyze the perception that future teachers had of incorporating AR into classrooms. The PANE contents developed from the PE area were taken as the basis for this study.

2. MATERIAL AND METHOD

2.1. Participants

The study was conducted as part of the Degree in Teaching in PrE taught at the Faculty of Education (University of Zaragoza, Spain). Sixty-one of the 62 (98.39%) students who enrolled in optional year-4 subject, PANE, participated, of whom 33 were men (54.10%) and 28 were women (45.90%). Their average age was 22.67±1.48 years.

2.2. Instruments

Students voluntarily participated and were informed about the research objectives. Data were collected from the practice diaries which students used to write in once during each session. Basic guidelines were handed out to

prepare them to collect relevant information in accordance with the study objectives. To this end, participants had to reflect on two points of interest: first, on the perception they themselves had as users of RA tools; second, on the relevance that this technology could have for their future professional work. These constitute the two dimensions of the category system used for the content analysis, adapted from Canales-Lacruz and Ponzán-Frisa (2016). The indicators shown in Table 2 are the last level of concision, and refer to the possible responses to the analyzed categories.

Table 2. Category system

Dimension	Category	Indicator
1. Personal experience as practitioner	1.1. Satisfaction	1.1.1. New
		1.1.2. Usefulness
		1.1.3. Incorporation ICT
		1.1.4. Leisure
	1.2. Dissatisfaction	1.2.1. Uselessness
		1.2.2. Application failures
		1.2.3. Lack of novelty
		1.2.4. Dislike of ICT
		1.2.5. Errors in content selection
	1.3. Indifferent	1.3.1. Without a position for or against
	1.4. Others	1.4.1. Other grounds
2. Transfer to future teaching action	2.1. Facilitators	2.1.1. About participants
		2.1.2. About context
		2.1.3. About technology
		2.1.4. About methodology
	2.2. Limiters	2.2.1. Personal reasons
		2.2.2. Contextual reasons
		2.2.3. Technical reasons
	2.3. Alternatives	2.3.1. Alternative proposals to the activity or tools
	2.4. Intent to implement	2.4.1. Clear intention to use AR in the classroom
	2.5. Unspecified	2.5.1. Other unspecified information

The category system shown above was designed using a mixed process: inductive and deductive. It was based on previous indicators that resulted from the initial literature search to be later completed ad hoc as the content of diaries analyzed. All the categories obey the criteria defined by Heineman (2003) on exhaustiveness and exclusivity. Thus dimension 1.Personal experience as practitioners refers to the sensations that students had during the sessions during which the AR applications were used; Dimension 2. Transfer to future teaching action, participants had to express their views about a possible application in classrooms with their future students. Having identified the two main dimensions, the analysis was carried out according to the following definitions:

- *1.1. Satisfaction*: any positive feeling about using technology in classrooms, including aspects like novelty, perception of usefulness of content or enjoing the use of technology, regardless of the context and content to be worked.

- *1.2. Dissatisfaction*: this category incorporates all the arguments that oppose those defined in the previous section. Here we find opinions such as lack of utility or novelty, errors in the applications themselves or Internet connection, or views about using ICT and it not matching the taught contents.

- *1.3. Indifferent*: this category comprises the opinions of those students who did not provide explicit statements or arguments in favor or against using ICT for PANE learning.

- *1.4. Others*: this last category brings together ideas, comments and opinions on using AR that cannot be included in any of those mentioned above.

- *2.1. Facilitators*: this category includes all the ideas that may refer to elements that help to incorporate AR into classrooms. Facilitators were initially classified into three indicators: student-related (e.g. predisposition, attitude or being used to work with technological tools); context-related (e.g. availability of mobile devices, existence of a powerful Internet network that can assist the activity or the possibility of collaborating with other knowledge areas, such as Plastic Education or Mathematics); technology-related (applications that do not require any Internet connection). A fourth indicator, methodology-related was an emergent indicator that resulted from students' reflections.

- *2.2. Limiters*: elements which, unlike those defined in the previous point, hindered incorporating AR into classrooms. The established indicators were practically the same because of the possibility of finding student-related (e.g., rejection of technologies), context-related (prohibition of using mobile devices in classrooms) or technology-related (need to be a minimum age to register a user account) limitations.

- *2.3. Alternatives*: this category includes all the ideas or reflections that suggest changes in using ICT or in designing the proposed activities.

- *2.4. Intent to implement*: the intention to work in the future with AR as an extra methodological resource is explicitly stated.

- *2.5. Unspecified*: information on students' future teaching action that does not match the objectives of this work.

2.3. Process

This research was presented to students on the first day of the 2019/20 academic year. The study participants had to fill in the practice diary and hand it in no later than 1 week after the corresponding session ended. Only the practical sessions during which AR applications were used, as defined below, were herein taken into account. Table 3 lists the sessions and the contents developed through them:

- Creating and reading QR codes (*Quick Response Code*). This operation consists of assigning different types of information, such as images, videos, text or accessing websites, to an image formed by three squares and a matrix of points (Fernández, Herrera-Vidal & Navarro, 2015).

- HpReveal. Information is also attached to a picture. However, the marker can be any type of image, and not necessarily a QR code, with which videos or images can be linked.

- Randori. An application designed to project images and videos onto a screen. In this case, trellises were used to introduce climbing initiation games, and to learn how to make basic grips and movements both horizontally and vertically.

- Plickers. This application is designed to ask multiple-choice questions. It consists in cards with black and white squares with drawings orientated in four different ways that correspond to answers A, B, C or D. A mobile device scans all the drawings, analyses the answers and provides immediate feedback on hits and errors.

- Wallame. It is a geolocalized AR application that enables users to leave hidden messages that can only be revealed by placing the mobile device in one exact area.

- Geocaching. Another application based on geolocalized AR. It works by reproducing basic maps of different placesto guide users to discover hidden objects.

Table 3. Relation between the developed content and the number of delivered diaries

Module	Content	N sesions	App
1	MTB	3	HpReveal
2	Climbing	2	QR, HpReveal, Randori
3	Obstacles	1	QR, Randori
4	Trekking	1	QR, Plickers
5	Orienteering	1	QR, Wallame, Geocaching

Completing and delivering diaries formed part of the continuous course evaluation. In this way, only the depth of the descriptions was evaluated to give a Pass/Fail grade, which was weighted to calculate the final grade. Thus only the fact that students gave their opinions was taken into account, as long as they provided arguments to justify them. Their agreement or disagreement with the approach to practical sessions was not assessed.

The subsequent analysis of diaries was done in accordance with the phases proposed by Bardin (2002): pre-analysis, exploitation of the material and data processing/interpretation. The first phase, pre-analysis, consists in developing the category system. For this purpose, all the diaries were read to conclude the list of indicators mentioned above (Table 2). Next a pilot test was run with a small randomly selected sample (21.33%) to analyze the reliability between two independent analysts. The obtained Cohen's kappa value was k=.85, which meant that the analysis was reliable. In the second phase, exploitation of the material, all diaries were coded according to the previously defined indicators. The QSR-Nvivo 12 Plus software was used to process and interpret the results, which allowed certain quantitative indices about the indicators to be obtained (number of paragraphs, percentage compared to other indicators). Finally, an interpretative analysis was carried out in accordance with the study objectives and based on the testimonies provided by participants.

3. RESULTS

Students' response rate was high. Except for one, they all handed in at least one diary, and the participation rate was 98.39% throughout the course. The average number of students who handed in a diary was 92.73% for men and 95.00% for women.

Table 4. Relation between developed content and number of delivered diaries

Module	Content	N deliveries	% deliveries
1	MTB	58	95.08
2	Climbing	61	100
3	Obstacles	56	91.80
4	Trekking	58	95.08
5	Orienteering	53	86.89
	Total	286	93.77

According to content, and as seen in Table 4, more deliveries were obtained for climbing, with 33 men (100%) and 28 women (100%). These same data were repeated for trekking content, but men presented 90.91% of the works (30) on this occasion. The content in which fewer deliveries were counted was orientation, with 29 men (87.88%) and 24 women (85.71%).

The data analyzed with the NVIVO program are presented below and follow this structure: an initial presentation of the quantitative data on the frequency of codifying different information units (dimensions, categories, indicators) in diaries; a second part presenting the interpretative analysis. The latter was accompanied by textual fragments, obtained directly from the diaries delivered by students. The names that appeared in this analysis were fictitious to guarantee participants' anonymity.

In all, 335 references were coded in this way, of which 59.40% referred to the remarks made by students on transferring AR to their future teaching action (Figure 1). The remaining 40.60% fell in the first dimension (personal experience using AR during the practical sessions of the subject while the experience was underway).

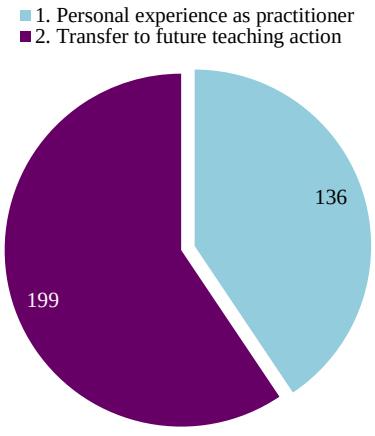

Fig. 1. Coding the study object dimensions (N values)

Satisfaction was the most frequently coded category (80.88%) of all those in the first dimension. In contrast, only 13.97% of the references defined the experience of working with AR as dissatisfactory (Figure 2).

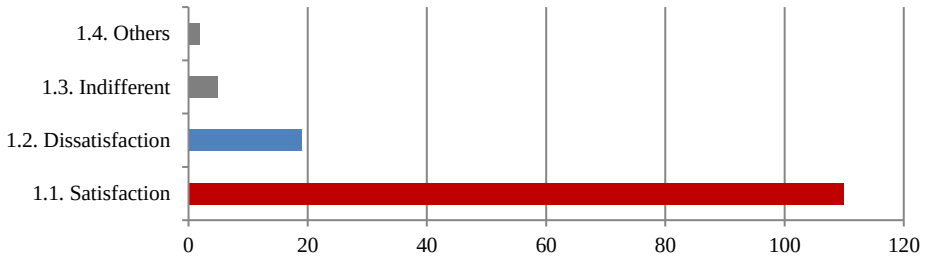

Fig. 2. Student assessment when using AR tools (N values)

The results in the second dimension were more varied. Facilitators (46.23%) and limiters (33.67%) were the most referenced categories when students were asked about the possibility of carrying out these contents as future teachers. Of all the references, 12.56% were related to proposing alternatives to the way in which sessions were performed (Figure 3).

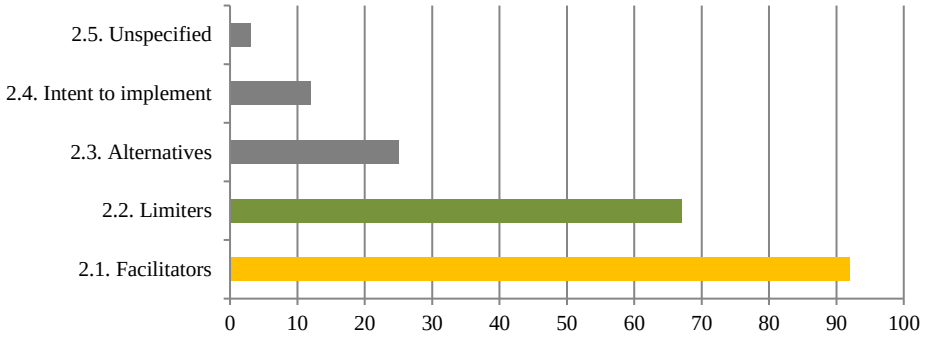

Fig. 3. Reflections on the possible transfer to classrooms in their future teaching action (N values)

Table 5 shows the relation between the indicators and all the contents in which AR tools were used. According to the previous results, only the indicators corresponding to categories 1.1 Satisfaction and 1.2 Limiters were taken into account for the interpretative analysis because they obtained the most codifications.

Table 5. References coded in relation to the contents implemented by AR

Indicador	MTB	Climbing	Obstacles	Trekking	Orienteering	Total
1.1.1. New	3	1	1	1	5	11
1.1.2. Usefulness	24	6	5	8	20	63
1.1.3. Incorporation ICT	4	0	1	0	9	14
1.1.4. Leisure	3	2	2	3	12	22
1.2.1. Uselessness	2	0	0	0	0	2
1.2.2. Application failures	4	0	0	0	1	5
1.2.3. Lack of novelty	1	0	0	0	0	1
1.2.4. Dislike of ICT	6	0	0	0	0	6
1.2.5. Errors in content selection	2	0	0	0	3	5
1.3.1. Without a position for or against	4	0	0	0	1	5
1.4.1. Other grounds	2	0	0	0	0	2
2.1.1. About participants	3	2	0	0	5	10
2.1.2. About context	5	1	3	1	4	14

2.1.3. About technology	4	0	2	0	4	10
2.1.4. About methodology	21	8	5	8	16	58
2.2.1. Personal reasons	5	0	0	0	0	5
2.2.2. Contextual reasons	21	1	1	2	21	46
2.2.3. Technical reasons	8	0	2	0	6	16
2.3.1. Alternative proposals to the activity or tools	14	1	0	1	9	25
2.4.1. Clear intention to use AR in the classroom	5	0	0	1	6	12
2.5.1. Other unspecified information	1	0	0	2	0	3
Total	142	22	22	27	122	335

Figure 4 compares the number of satisfaction and dissatisfaction responses for each indicator. We can see how students indicated that working with AR was useful for developing PE contents during practical sessions, with 57.00% of codifications. This is supported by the following arguments:

- *In my experience, it's easy to carry out the session because you work cooperatively and the guides help you to achieve the results with the task*. (Daniel, MTB diary)

- *In this way, as I said before, autonomous work is encouraged because students watch the video, acquire information and put into practice the knowledge intended to be instilled with these videos. With this methodology, students themselves see the difficulties of the task and must solve those proposed*. (Eduardo, MTB diary)

- *The design and development of the climbing session allowed me to see many possibilities of using this sport as a means to promote interdisciplinary projects in areas such as mathematics (by working on accounts at different levels), geography (by studying the relief or the main mountain ranges in our environment), English or foreign languages (by introducing activities that work with vocabulary, such as colours, body parts or numbers), etc. Personally, this task also helped me to find different applications of Information and Communication Technologies in Physical Education lessons*. (María, climbing diary)

Fun also appeared with noteworthy values (20.00%).

- *In this way, our students learn about history, they observe things in the city that they may not have observed before, and they have fun; they have fun learning*. (Rosa, trekking diary)

- *It was a very fun and enriching activity performed in a very pleasant environment in which you can work many things thanks to its wide variety of flora, fauna and available schools where we can perform different activities*. (Isabel, orienteering diary)

The two other presented indicators had lower percentages and represented ICT incorporation itself and the feeling of novelty when using it as arguments to indicate satisfaction.

- *Moreover, presenting the knowledge to be worked on during this session with an AR application, including the use of ICT in classrooms, facilitates learning by being a very appealing way to approach content. What would normally be a boring session, in which the teacher is the model and students are mere imitators, becomes an activity that favours autonomous learning, cooperation and the development of the technological competence*. (Ana, orienteering diary)

- *It's something totally different compared to what we're used to doing in PE classes*. (Elisa, MTB diary)

Sources of dissatisfaction were divided almost equally among dissapointment in using ICT in this subject (31.58%), failures in the application (26.32%) and inappropriate content selection for applying AR tools (26.32%).

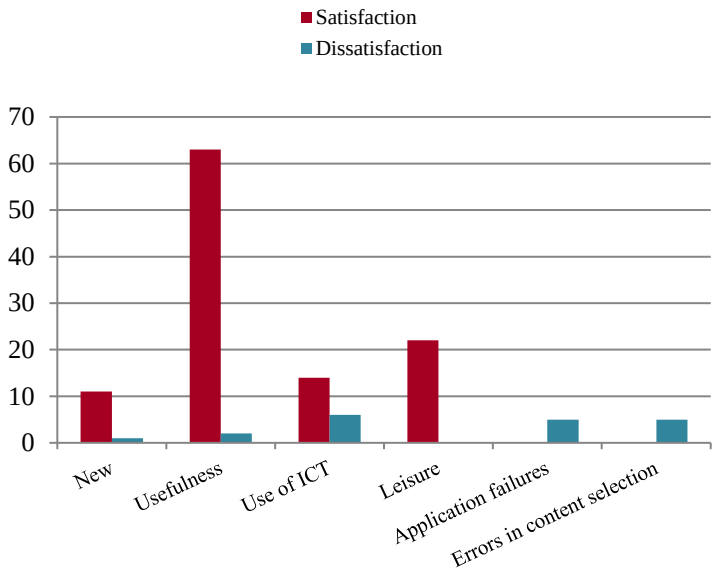

Fig. 4. Reasons for satisfaction and dissatisfaction reported in relation to using AR (N value)

Figure 5 shows a comparative view of students' perceptions of the aspects that could facilitate or limit using AR in their future teaching action. The methodology positively stood out, with 86.57% of the references falling in this category. The main arguments were dynamic sessions and the possibility of proposing interdisciplinary work.

- *This activity is full of facilitators and possibilities. It is so interdisciplinary that you can work on any: social sciences, natural sciences, mathematics, history, etc. During this session, ICT are very useful, they motivate you and make games more dynamic*. (Beatriz, trekking diary)

- *Thanks to this type of methodology and technology, students' interest in issues that would not normally catch their attention if they were in the classroom using a textbook would be aroused*. (Diana, orienteering diary)

On the contrary, contextual issues were the main limiting factor (68.66%). Of them, lack of devices or not having a Wi-Fi network, along with being forbidden to use mobile devices at school, were the iiems mostly referred to.

- *Regarding the limitations for conducting this session, I think they'd arise when trying to use the HP Reveal application as some schools may not allow mobile phones or new technologies to be used in classrooms, or may have no access to the necessary resources*. (Pablo, MTB diary)

- *Finally, the limiters that I think could show up in this type of activities are lack of parental or school permission to leave the center, and reluctance to use mobile phones, because some families still don't think highly of working with new technologies in schools*. (Gabriel, obstacles diary)

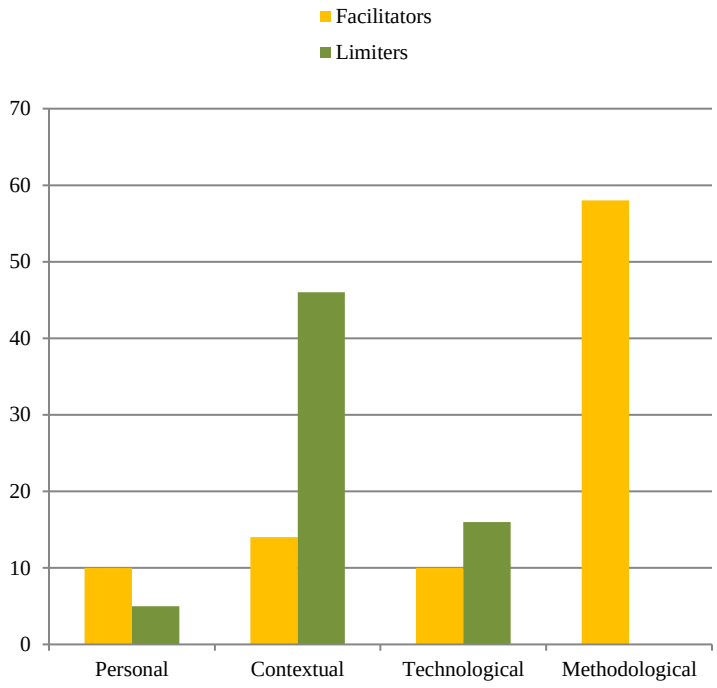

Fig. 5. Assessment of the factors that will enable or hinder their transfer to classrooms (N values)

Regarding technological aspects, there were both facilitators (14.93%), such as simplicity of use, and limiters (23.88%), among which the characteristics of the used apps stood out. Examples included Wallame photo quality or issues about HP Reveal inserted material.

- *There are some aspects that need to be improved, such as having to keep the mobile device constantly quiet in the same position so that the video plays smoothly from start to finish.* (Antonio, MTB diary)

- *During the session we found a couple of limiters, being one of them specific for those applications of augmented reality that use photos, which require to be under the same conditions as the ones in original photo. If you don´t meet those conditions, you cannot get the augmented reality image*. (Alejandro, orienteering diary)

4. DISCUSSION

The main objective of this study was to find out how students of the Degree in Teacher Training in PreE valued using AR in classrooms. Most pointed out beneficial aspects, such as the usefulness or the possibility of preparing more dynamic and entertaining sessions for students. The obtained results coincide with different studies reporting increased motivation and student participation after incorporating ICTs into classrooms (Cabero & Barroso, 2016). Other authors have stated that as this methodology is a change from traditional teaching, its novelty also contributes to enhance student engagement in sessions (Herrera, Ramírez & Ramos, 2010).

Regarding the difficulties associated with transferring AR to classrooms, participants' opinions coincide with those offered in previous studies, in which contextual factors were highlighted as the main limitation (Leiva & Moreno, 2015; García, 2017). Some of the reasons pointed out in both cases were the number of needed devices, the complexity of some applications or having to depend on software. Morover, the time invested in arranging activities can also be a problem. Despite providing an explanation of the functioning of different applications, our results revealed that it implies spending more time (Gavish et al., 2015), which teachers must take into account during sessions. In addition, exceptional failures in the functioning of applications can take place and may result from bad network connectivity, a finding that coincides with San Pedro, Villalustre and Herrero (2019).

When focusing specifically on PANE, we particular found references in the literature about using AR in climbing (Kajastilla, Holsti & Hämälainen, 2016), and more notably in orienteering (Moreno & Pérez, 2017). It is noteworthy that various experiences related to other areas of knowledge at university have been found, which focus on student assessment, or involve organising treasure hunts, orienteering races and gymkhanas (Caldeiro-Pedreira, Yot-Domínguez & Castro-Zubizarreta, 2018; Castañeda, Gutiérrez & Román, 2014). So there is reason to think that orientation content is ideal for implementing AR into any education stage.

5. CONCLUSIONS

The students who participated in the present experience considered that AR is a tool that offers many advantages as a didactic resource. The arguments they provided for implementing curricular contents via this technology are its usefulness or the feeling of fun that using ICT can arouse in students, which leads to student motivation to participate and learn about PANE. Teachers in training advocate using AR in their future teaching action for its two main advantages: dynamism and amenity which, together, offer the opportunity to conduct interdisciplinary work. However, they consider that the contextual delimiting aspects, which can be simplified as lack of material (mobile devices and network connection) and the reluctance of families, teachers and school management teams to use mobile devices in classrooms, still weigh heavily.

This experience can be transferred to other knowledge areas where AR facilitates the understanding of contents or presents them in a different format. Furthermore, its sustainability is guaranteed thanks to the use of free software. All the implemented Learning and Knowledge Technologies are free (albeit at least require a smartphone) and can, therefore, be used in university teaching by registered students, and in students' future careers. In the PrE stage, it can be an ideal resource for developing students' DC. In addition, previously published studies attach special importance to using AR to favor the construction of more complex and interesting learning contexts for students, which is especially interesting in the PE area. As for the PANE contents about which this experience was carried out, AR will possibly contribute to overcome the limitations that schools face when implementing them.

Acknowledgements

The authors would like to thank the Vice-rectorate for Academic Policy of the University of Zaragoza (Spain) for the funding obtained through its calls for teaching innovation to disseminate the previous work that led to this new study.

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Shift to Digitalized Education due to Covid-19 Pandemic and the Difficulties the Teachers Encountered in the Process

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Abstract

Education continues remotely rather than face to face due to coronavirus pandemic in the world. Distance education also revealed the impact and status of digital technologies in countries. The inequality - that is, the digital gap - in the access and use of information communication technologies (ICT) by individuals in different socio-economic conditions has become more visible. The experiences and habits that teachers have gained over the years are in the classroom. Education and training processes have been moved out of the classroom for the first time. It is especially important that the teacher-student relationship should not be broken in this process. In the process, teachers can keep their communication with their students alive by using the different possibilities of technology and have the opportunity to follow the academic development of the students. Insufficient and inexperienced teachers to distance education technologies have affected the success of education in this process. In our study, qualitative research method was used, and the difficulties the teachers encountered in teaching process, and solution suggestions for the teachers who had to do distance education were expressed. It is concluded that In-service education is extremely important for novice and inexperienced teachers to deal with online education.

Keywords: Digitalized Education, Virtual Education, e-Learning, Covid-19, Educational Management

1. INTRODUCTION

Coronavirus (Covid-19), which affected the whole world shortly after its emergence in the Far East, caused disruptions and changes in almost every sector. The first case was seen in Turkey on March 11. Since then, all relevant units have implemented various decisions in their areas of responsibility. The important decision concerning the education sector was announced on 12th of March. In this decision, it was announced that from 16th March to 30th March, face to face training was interrupted for two weeks. It was suggested by the Ministry of Education that the first week of the two-week break should be spent resting at home.

The Minister of Education stated that with the service they would offer starting from March 23, students would continue their education process from their homes. It was decided to continue training on the internet through TV channels to be opened for three different levels as primary and secondary education over Turkish Radio and Television (TRT) and the Education Information Network (EIN) system. With the increase in the number of cases in the following days, it was announced that the education in schools would not be done until April 30th, and the education would continue digitally in this process. Considering that almost every family is directly or indirectly related to education, this decision taken and put into practice can be said to be accurate.

Rapid developments in information and communication technologies affected the education sector, as in every sector, before the Coronavirus (Covid-19). With the coronavirus (Covid-19) outbreak, the importance of this effect was better understood by all educational circles. With the break in face-to-face education, the transfer of the EBA,

which was previously used by the Ministry of National Education (MoNE) to TV via TRT, and the fact that universities and some private schools started to carry out their courses in digital environment by accelerating the digitalization process in education has accelerated. In education which gained speed due to a necessity, the digitization movement should be supported after the coronavirus (Covid-19) outbreak as well.

Digitalization in education brings with it many opportunities. In order for these opportunities to contribute positively to the education system, especially teachers need to adapt to digital education (Henriksen, 2011; Cartelli, 2013; Peicheva and Milenkova, 2017; Milenkova and Manov 2019; Sicilia, García-Barriocanal, Sánchez-Alonso, Różewski, Kieruzel, Lipczyński, Uras, & Hamill. (2018; Luz; Diaz; Guillén-Aparicio, Tello-Cabello, Herrera-Paico and Collantes-Inga (2019). With the investments and trainings made in recent years, there have been positive developments in the technological infrastructures of classrooms, schools, and technological knowledge and skills of teachers. By spreading these positive developments throughout the education and training processes and supporting the system with digital tools, it is possible to increase the quality both in the process we are in and in the next process. In this process, while supporting technological knowledge and skills of teachers, necessary trainings should be provided to develop interactive content suitable for digital education. Considering that the trainings for the development of digital content of teachers before and during the service are limited, teachers need to be supported at this point. In addition to the support of the system, it would be beneficial for the teachers to direct the trainings they will receive regarding their professional development to these areas. The fact that teachers examine the content offered to students via EIN and give feedback to the system where necessary, will contribute positively to the quality of the education system specifically for digital education.

1.1. Impact of Coronavirus on Education

The Covid-19 outbreak continues to adversely affect all aspects of life in the world. In this context, it was the first time that education was affected on such a global scale for the first time, and education institutions at all levels from pre-school to higher education were rapidly closed in most countries. It is now known that over a billion students at all levels worldwide are moving away from traditional educational settings. Countries quickly began to close this mandatory gap in education with different distance education platforms and are trying to overcome the negative effects of the process on education with minimal damage (WEB 1).

Due to the unexpectedly closed educational institutions and quarantine days all over the world, education has started to be carried out on digital platforms at home and this naturally caught the countries unprepared. While most countries are caught unprepared for mass distance education in this way, the differences in opportunities and digital literacy differences between the different socioeconomic groups present in the countries have also opened up to discuss long-term outcomes of distance education. While the schools are open, it is worried that the differences in academic achievement among children of families with different socioeconomic backgrounds in almost all countries will deepen, especially with the closure of schools, due to the Covid-19 outbreak.

It has been known for many years that families' socioeconomic status and education levels have had a significant impact on their children's academic success. Reducing the effects of an external factor in education that is out of school and affecting school performance so much is also the most important problem area education systems have to face and overcome. To draw the attention of countries to this problem area, OECD PISA international research has been preparing detailed reports on the countries' performance in this context for years. In this context, the effects of these situations of students with different socioeconomic backgrounds on school performances and differences between students and school success are significantly reduced in countries that stand out in equal opportunities in education. The Finnish education system, which is shown as an example in this context, draws attention by being one of the countries with the least impact of such factors outside the school rather than its place in the PISA ranking (Özer, 2020 WEB 2).

With the break in education at schools, the Turkish national education system is experiencing a process that it has not experienced before. When the summer holidays are ignored, face-to-face education is not the longest and in this actual situation, the difficulties faced by the teachers stand out. The concerns and problems faced by paid teachers in the national education system and teachers working in private schools, which make up about 20 percent of formal education, are an important problem area. Paid teachers working in the national education system charge as much as the hours they teach. In this process, paid teachers who cannot attend classes together with the break given to the lessons cannot receive salaries. With the interruption of the education given in the schools, it is seen that the financial difficulties of some private schools are reflected to the teachers. It will be beneficial to take the

necessary steps in order to prevent teachers who are a respected profession and teachers who have such financial problems in the process not to lose their dignity with their students and the society.

In the days of the Covid-19 outbreak, international organizations such as UN, UNICEF and OECD are publishing reports and calling on countries so that the new education conditions that have to be sustained in the home environment do not further increase the existing differences in success in countries and create a new social problem area. For example, in the new report published in April by the United Nations (UN) Education Agency titled 'Covid-19 Spreading Digital Learning While Spreading', Nearly 830 million students around the world do not have a computer that they can use outside of school, and more than 40 percent of these students do not have internet access. On the other hand, scientific research shows that learning losses, especially during the summer holidays, differ according to the socioeconomic levels of the families and the lowest socioeconomic groups are affected negatively from this situation. Therefore, in the Covid-19 outbreak, it is warned that school closures will have a similar effect if measures are not taken, so the existing differences will deepen and its social cost will increase.

International reports show that two main issues stand out in the fight against the impact of the Covid-19 outbreak on education (WEB 2, 2020). First, the problems that students with lower socioeconomic backgrounds may lack in food support from schools regarding healthy nutrition may result in this process. For this group of students, school has meanings beyond education. Nutrition is just one of them. In many countries, countries take different initiatives so that these support can be sustained in some way, as these students can only get their daily healthy nutrition support in schools. For example, it is seen that multi-stakeholder initiatives for the distribution of daily nutrition parcels to approximately 250 thousand students in Ireland have increased. Particularly, the possibilities of distributing educational material supports along with the nutrition package to this group of students, who have difficulty in accessing online resources, are discussed. The second is the problems that can be caused by differences in home education opportunities maintained in digital environment. On the one hand, not all students have the same study environment at home, but on the other hand, computer and internet access is a separate problem. Considering the economic effects of these processes, the fact that the lower income groups are adversely affected by these conditions brings the risk of the family support, which is limited at home, to disappear completely under normal conditions.

In the second problem area, digital literacy is one of the most important factors that will determine the long-term effects of education entering the digital channel. In this context, since education continues at home, digital skill levels of both families and students directly affect the performance of education. There are serious differences between countries in terms of digital skills. For example, while 44 percent of the population in the EU countries still does not have basic digital skills, it is known that 37 percent of workers in the labour market do not have sufficient digital skills, so different projects are produced to increase digital skills. For example, according to Eurostat 2018 data, while the proportion of people without digital skills is around 2 percent in Denmark, this rate is around 10 percent in Germany, about 20 percent in Ireland and about 30 percent in Greece. Therefore, it is seen that the digital skills of adults, who are expected to support their children's digital education at home, have a very heterogeneous structure. It is also suggested that when students' digital literacy skill differences are added to the result, the most negative effect will be realized in the lower socioeconomic group again, and at the end of this process, the digital divide that already exists in societies will continue in a different way.

1.2. Measures Taken Against Adverse Effects of Covid-19 on Education

In Turkey, the Ministry of National Education (MoNE) gave relatively faster response compared to other countries to combat the Covid-19. After the schools were closed, it immediately offered the support of distance education via television for the students who had problems with internet access. The course contents needed in distance education were rapidly produced for all levels and moved to distance education platforms. While education at all levels is maintained by distance education, the variety in distance education continues to increase every week. Television broadcasts were also made on weekends in the following days, and on weekends, it started broadcasting to support students preparing for the central exam under the transition to high school system and for higher education institutions within the scope of transition to university. It was decided to continue these broadcasts in the summer months. Numerous psychosocial support packages have been developed and implemented rapidly to support students, parents and citizens in the field of special education and guidance. On the other hand, while vocational high schools produced all the products needed from the disinfectant to the mask, from the face protective trench to the disposable apron and overalls in this process, they quickly produced many products from the respiratory device to the mask machine, from the video laryngoscope device to the air filtration device. Given the

size scale of the students in Turkey for the first time in this context the value of services produced, may be better understood, despite all the shortcomings.

The Covid-19 outbreak affects all sectors including education and profoundly reshapes it. However, the effect of the reshaped education methods is not equal for everyone. In this process, MEB was very active and quite dynamic in terms of education, research and community service in a synchronized manner with all its units. However, as in all countries, the scale of success differences between schools is a known fact. With distance education, it is aimed to increase the readiness of the school so that the students do not leave the education and make compensation of education quickly when face-to-face education starts. Therefore, preparations for the program for compensation are ongoing so that the distance education process does not further increase these differences. Support and training courses are planned to be the main center of compensatory education, especially in order to give more possibilities to students in disadvantaged schools and students who cannot undergo an efficient distance education process due to various impossibilities.

As the measures aimed at controlling the new type of coronavirus (Covid-19) epidemic are being put into practice, and the practices aimed at people's staying at homes in the world, this has led to the transition to distance and virtual education in primary and secondary schools and universities in many countries (Yüzbaşıoğlu, 2020 WEB 3).

1.3. Measures and Actions taken against Pandemic in the World

Countries try to reach students with online programs or radio and television broadcasts to the extent that their technological infrastructure allows. The Ministry of Education in China, where the outbreak occurred, recommended the transition to distance education in the spring semester, which was planned to start on February 17 in primary and secondary schools, and stated that the necessary equipment would be provided to educational institutions.

Telecommunications and internet companies such as China Telecom, China Mobile, China Unicom, Alibaba, Baidu and Huawei supported the distance education program conducted jointly by the Ministry of Education and the Ministry of Industry and Information Technology in the country.

In the developed cloud learning system, 50 million students can attend classes at the same time, and courses for primary and secondary schools are broadcast on television channels. In addition, universities have prepared an online education program suitable for their own curriculum in the new academic period and switched to distance education.

Distance education takes place in most Asian and Pacific countries. Most of the Asian and Pacific countries, which were the first places affected by the epidemic due to their geographical proximity to China, also initiated distance education.

With the end of the spring holiday in Japan at the end of March, the opening rate of schools remained at 55 percent in 40 administrative districts except Tokyo and the 6 administrative districts. After the state of emergency was declared on 7th of April throughout the country, most of the primary and secondary schools started distance education. In Japan, where the academic year started in April, 78 percent of higher education institutions decided to postpone the start of classes.

In Australia, the second semester of the four-semester education year, which started at the end of January, began on the Internet on April 13, classes were taught online from classes without students. Some of the private and public schools started education through common video conferencing applications such as Zoom, Webex, Microsoft Teams and Google Meet, and in others using online education platforms such as Education Perfect and Compass.

Since the partial curfew began on March 18 in Malaysia, the Southeast Asian country, public schools, private schools and some universities have started distance learning online. According to research by the Ministry of Education of Malaysia on distance education, 36.9 percent of primary and secondary school students across the country don't have the devices like computers or tablets to follow online classes. Following the decision to extend the ban until April 28, television broadcasts started for primary and secondary school students on April 6. Broadcasts are made on the TV Okey channel established within the RTM of Malaysia state television.

In Indonesia, the Covid-19 epidemic negatively affected the education life of 68 million students. Upon the spread of the epidemic in the country in mid-March, President Joko Widodo called for national education to be continued at home. Because all students and teachers do not have internet access, it is planned to broadcast courses on the state-owned TVRI channel for 3 months.

In Pakistan, where education was interrupted due to the epidemic, education is given through lessons from the newly opened "Tele School" channel. In the Tele School channel, which was established in partnership with Pakistan Ministry of Education and Pakistan Television (PTV) and opened with a ceremony attended by Prime Minister İmran Han, courses are taught for children from the first year to the 12th grade.
It was also announced that education in universities in the country will start on June 1 and that the second term education will be done in a virtual environment if the epidemic continues.

In Afghanistan, where the infrastructure is not sufficient due to long wars and conflicts, students are tried to be reached through public television and radio channels. The students of primary and secondary schools receive education through the lectures broadcasting on the channels of the Ministry of Education of Afghanistan Maarif TV and Maarif Radio and the state-owned television channel RTA. In the country where there are continuous power cuts, it is not yet known how effective this system can be maintained. On the other hand, universities offer distance education over the internet in different ways suitable for their curriculum.

In Syria, where the civil war continues, refugee camps, where the internally displaced are living, are trying to provide distance education to protect the health of children and families, so as not to bring students together in classrooms.

Europe caught unprepared for distance education In Europe, which became the epicenter of Covid-19 after China and before the USA, the epidemic severely challenged the education system as well as the health system. While countries such as Sweden and Iceland insist on keeping schools open while maintaining social distance rules, most of the schools across the continent were closed on March 16. European countries, whose national curricula are quite different, turned to distance education.

In Belgium, especially public schools could not switch to a common distance education system against Covid-19. In Belgium, which could not create an "interactive" education system after the schools were vacated on 13th of March, teachers in primary, secondary and higher education started to send their assignments to students via e-mail.
While the summary of the previous semester is being passed on the assignments that do not include new topics, no attempt was made by the government to establish a platform for students to communicate with their friends or teachers in a virtual environment or to create a platform for lecturing. A distance education system that can be used across the country has not been developed yet.
A forth of teachers in France were able to switch to distance education. Another country that adopted a system where teachers gave homework to students was France. Despite the fact that all schools, including universities, were closed as of 16th of March, the Ministry of Education could not provide teachers with comprehensive digital programs to continue their classes. Although the Ministry has developed the "My class is at home" application, research has revealed that only a forth of the teachers use this application. In the news in the French press, it was emphasized that 800 thousand teachers in the country try to ensure the continuation of the education of the students with their own means.

Every state in Germany determines its own system In Germany, different practices emerged during the Covid-19 era, as each state determined its educational policy. Despite the decision to gradually open schools in the country from 4th of May, some states have decided to partially open schools. "Abitur" exams, known as high school graduation exams until 4th of May, were decided to be held in all provinces. On the other hand, a different path is followed in each state and school on how to provide distance education to students who have to stay at home. These applications include examples of giving homework for students weekly or for several days via e-mail, teachers' lecturing through video conferencing, and students uploading homework on pages created over the internet. German universities are preparing for digital education. It is stated that while the videos prepared allow students to watch whenever they want, some courses will be broadcast live on the internet.

BBC produced course content in the UK. Even though the private schools started attending classes through video conferencing programs with the holidays of schools on the 20th of March in England, students who were educated in public schools could not attend a month. Meanwhile, the BBC produced 14 weeks of course content in line with the curriculum.

In Spain, all schools and universities were closed on 14th of March. While schools are not expected to open again in this school term, normal education is expected to resume only in September, according to developments. Education in primary and secondary schools is continued over the internet with very limited opportunities. In the universities, it is expected that exams will be held and the termination of the education period will be carried out with the more widely used internet education.

Switzerland has implemented a similar system in Turkey. All schools were closed on 16th of March with the “State of Emergency” application. Students continue their education in classes created on the internet.

Distance education practices differ in the USA The US, the "epicenter" of Covid-19, was caught unprepared for the distance education system as well as the epidemic. Although the first case in the country occurred on January 21, the first decision to suspend education came from Ohio on March 12. After that state, states such as Maryland, New Mexico, Oregon, and Michigan decided to switch to distance learning for a while. According to the data of the US Department of Education, at least 124 thousand of the total of 132 thousand schools, including 98 thousand state schools and 34 thousand private schools in the country, decided to suspend education, and these decisions affected more than 55 million students. In the USA, 34 states and the capital, Washington DC, it was decided to close schools until the end of the academic calendar. 38.6 million students are affected by this decision. In New York, the school's downtime was extended until May 15, but schools are not expected to open until the end of the academic calendar in any US state. As every state and education region in the country follows different curricula, distance education practices also vary across the country. In this period, where teachers preferred current technological environments, the most used applications are the programs that offer multi-video speech such as Zoom, Skype and Google Classroom. Many reports in the US press stated that teachers do not have enough infrastructure to carry out such an education system in a healthy way. In addition, each student's lack of equal internet access and technological devices created a separate discussion topic.

RESULT AND SUGGESTIONS

While the Covid-19 outbreak caused by coronavirus affected all areas of life, it also caused changes in the field of education. With the rapid development of information and communication technologies, the place and time limitations in education have disappeared. Universities started to apply distance education to their students in order not to interrupt their education (WEB 4, 2020).

In the universities in Turkey, various distance education applications and programs are used. For instance, students and academics come together in LMS, a virtual classroom application. Academics are able to share lecture notes, documents, and instructors and students are lecturing live. At the same time, students can participate in live lectures through a different program determined by the university. Students who are unable to attend the course can access the course video and watch the video, share announcements, documents or assignments with STIX developed by the Software Planning Unit.

Along with the speed of development of information and communication technologies, meeting the need for access to information and getting information in a short time removed the place and time limits (Burgess and Sievertsen, 2020; Aesaert et al., 2015). Thus, using different educational applications visually and effectively brought distance education back to our agenda. Today, parallel to the technological advances, preparing the material, sharing and ensuring the realization of an effective concurrent lesson environment will expand and zoom the communication between the demander and the presenter of distance education in the following years.

One of the most important issues in the distance education process is content management. In order for distance education environments to be effective, instructional designers must have the ability to master the theoretical foundations underlying instructional design and to establish a relationship between theory and practice. At the same time, it is very important to share the training materials in content management, to use the correct measurement and evaluation system for sharing rates, and to feed on content that supports learning and teaching activities.

In the near future, algorithms should be produced that design and teach the right learning steps for students of different academic levels. The transformation of existing local and instructor-based dynamism of distance education into a user- and intelligent system-based dynamism should be ensured.

It is stated that the students' being out of the house for a long time and being subjected to social isolation during the closed period of schools may create a varying stress and trauma effect in different age groups (WEB 5, 2020). In order for students to cope with stress, a support action plan needs to be created and implemented both during and after schools are closed.

The teachers in Primary and secondary schools should not rush to use new tools. They should strive to use existing teaching materials, textbooks and online platforms, keep the number of students low during interviews, as keeping the number of participants low will make the interviews more effective. They should try to meet each student at least once a week. They may have students to whom they have never accessed. When schools are opened, the teachers should start designing the works they need to do with students. They should ensure collaboration among students, and enable students to work together with group assignments using online platforms. They should stay in touch with their colleagues and try to involve the parents in the process. If possible, they should try to involve their

students who do not have technological tools at home, who are not actively involved in the distance learning process, with available printed materials and alternative methods.

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Management, Economics and Marketing
(IAC-MEM 2020)

Functions of Sports Management and Professionalism in Sports

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Abstract

Management is a process with a social element. It requires the efficient use of resources combined with the guidance of people in order to reach a specific organizational objective. Management is an aspect of the business that doesn't have the same specific duties some of the other parts of the business have. While a sports manager will always know quite clearly the expertise and responsibilities he or she has, a manager needs to have a much broader set of skills, with the tasks ranging depending on the business. Yet, management like all the other parts of the business have certain functions to guide the operations. In the construction and development of the sports market, the immediate participants in the sport are involved: athletes, sports coaches, sports managers, fans, as well as the media. Throughout this system, the media play an important role, in strengthening and promoting the disputed market to the public. The function of sport management including: planning, organizing, staff allocation, management, and controlling. Result and accomplishment is the only measure of success of a professional person or a profession. Professionalism, both at work and at any other place, is defined by the very behaviour of the individual, it is particularly prominent in professional sport. Professionalism does not only refer to the positions we define as professions that require higher education and high earnings, but also to all professions and qualifications.

Keywords: Function, Management, Sport management, Business, Sport, Professionalism.

1. INTRODUCTION

Management is a process with a social element. It requires the efficient use of resources combined with the guidance of people in order to reach a specific organizational objective. Management is an aspect of the business that doesn't have the same specific duties some of the other parts of the business have. While a sports manager will always know quite clearly the expertise and responsibilities he or she has, a manager needs to have a much broader set of skills, with the tasks ranging depending on the business. Yet, management like all the other parts of the business have certain functions to guide the operations.

The sport management academic discipline has grown tremendously over the last 40 years[1] **(Weese, 2002).** Sport management **(Drayer, Joris, Stephen L. Shapiro, and Seoki Lee, 2012),** is the field of business dealing with sports and recreation. Some examples of sport managers include the front office system in professional sports, college sports managers, recreational sport managers, sports marketing, event management, facility management, sports economics, sports finance, and sports information.

Sport management[2] **(DeSensi, Kelley, Blanton and Beitel, 2003),** involves any combination of skills related to planning, organizing, directing, controlling, budgeting, leading, and evaluating within the context of an organization or department whose primary product or service is related to sport or physical activity.

[1] Weese, W. J. (2002). Opportunities and headaches: Dichotomous perspectives on the current and future hiring realities in the sport management academy. Journal of Sport Management, 16(1), 1-17

[2] Kelley, D. R., Beitel, P. A., DeSensi, J. T., & Blanton, M. D. (1994). Undergraduate and graduate sport management curricular models: A perspective. Journal of Sport Management, 8(2), 93-101.

1.1. Function of sport management

What it is and how sport management in sport can be defined, and what are the functions of sport management, are presented in the following section:

1. Planning: setting organized goals and developing a strategy for achieving them, predicting the future in which those goals will be achieved, developing goals.

2. Organized: setting a schedule of working tasks daily, weekly or monthly for each individual person in sports organisation (sports federation or sports club)

3. Staff allocation: delivering the intended functions of creative people trained for individual activities.

4. Management: motivating all members of the sports organization (sports organisation of sport clubs) to achieve highly productive goals by collaborating and executing the instructions they receive.

5. Controlling: monitoring of the objectives achieved, correction of deviations that go beyond established standards, (see below, Picture1).

Picture 1. Pictorial view of the functions of sport management

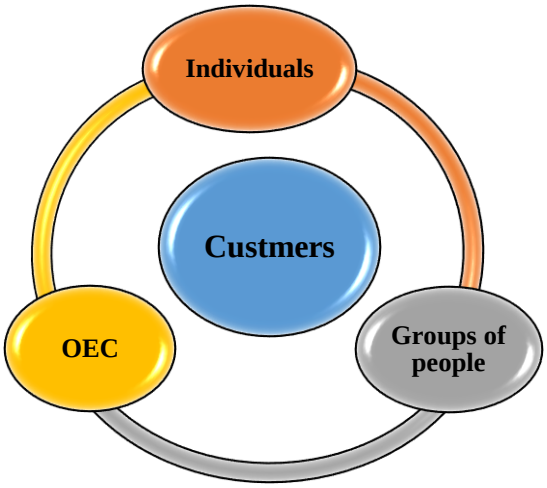
In the construction and development of the sports market, the immediate participants in the sport are involved: athletes, sports coaches, sports managers, fans, as well as the media. In this interconnected system in sport, the media play an important role, in strengthening and promoting the sports market in front of general public.

Very important for sport is his approximation closer to customer[3] **(Anastasovski, Nanev, Aleksovska-Velickovska, Naumovski, 2018:10-15)**, and those consumers can be from next groups:

1. Individuals, (In) (every one is a potential consumer).
2. Group of people, (GP), and
3. Organizations, enterprises or companies, (OEC), (see below, Picture 2).

[3] Ivan ANASTASIOVSKI, Lazar, NANEV, Lence A. VELICKOVSKA and Milan NAUMOVSKI (2019). Sport management, Skopje: Book, Faculty of physical education, sport and health, printing: Europa 92-Kočani, pp. 10-15.

Picture 2. Pictorial view of the potential customers



All this, above stated points to that sports market determine these categories of consumers (In, GP and OEC), which have desire and necessary for buying or selling products, ideas, services, souvenirs and other services offered by the sport as business system.

The consumer market from a position of the external environment of the industry make up:

1. Sports Auditorium, are sports fans, sports spectators, sports supporters, recipients of sports information through the media and anyone else in need of sports products from internal environment in the sports industries,

2. Advertising companies and sponsors, are companies and individuals who need to buy advertising service rights, which are owned by various sports organizations, athletes and organizers of various sports events,

3. The media, are media (TV, Radio and internet) companies who need to buy television rights to broadcast sports games and advertising rights services,

4. Trade and production, are companies who need to by purchasing the rights to manufacture and sell products on a licensed sportswear brand and its parts, which is the right in held by the sports organization (sports federation or sport clubs), or the organizer of the sports event, or the manager of agency who have a right for athletes,

5. Marketing and management agencies, are companies that act as intermediaries for the purchase of advertising and licensing rights, the rights to sell athletes and products, but sometime they are the buyers of TV rights,

6. Sport organisations, are federations and clubs that need to buy athletes for better results.

By the **(Lindsey Thompson, 2018),** while it may seem like all fun and games[4], running a sports team or community recreation center is all business and often requires a large staff behind the scenes. Just like other businesses, sports teams utilize managers, accountants, marketing professionals and salespeople to help bring in fans, oversee the athletes, and ultimately, make money. One of the principle roles behind an organization's success is the sports manager.

1. Responsibilities, at the professional level, the sports manager is responsible for hiring and firing athletes,

[4] Lindsey THOMPSON (2018). 5 Functions of a sports manager, *Expert text published in internet portal Chron*, on 29 June 2018.

2. Management duties, the sports manager performs management duties at a number of different levels. For professional teams, sports managers work with coaches and trainers to be sure each athlete has the training resources he needs to be the best at his position

3. The business of sports management, each season, the sports manager plans the budget, taking into account potential revenues, operating costs and salaries of everyone from the athletes to coaches to staff members,

4. Marketing and promotions, oftentimes, the sports manager acts as the face and spokesperson for the team and must conduct interviews and press conferences with the media, and

5. Miscellaneous duties, sports managers fulfill a number of other duties and jobs outside of professional, college and high school programs. Some work at fitness facilities or health clubs in charge of operations.

1.2. Professionalism in sport

Sports management professionals may function as agents, managers, marketing experts or public relations specialists. Result and accomplishment is the only measure of success of a professional person or a profession. Professionalism, both at work and elsewhere, is defined by the through the behaviour of the individual, it is particularly emphasized in the positional sport. Professionalism is not just only the positions we define as professions that require higher education and high earnings, but apply to all professions and qualifications.

Employers want new workers to be responsible, ethical and team oriented, and to possess strong communication, interpersonal and problem solving skills. Wrap these skills up all together and you've got professionalism.

Professionalism is not something you will be told when you get started, it is something that comes with the work itself. Professionalism is some kind of home education, but and more than that. Professionalism is that you need to own each of us and apply it in the performance of their tasks, which in a way guarantees the personal success of each individual. There are several traits in the literature when it comes to professionalism in performing tasks:

1. Safety (Sa), so that people can feel safe with you,

2. Competence (Co), that you are that person for a job with the necessary competencies,

3. Honesty (Ho), one of the most important qualities of any person for professional behavior,

4. Timeliness (Ti), only a professional person is characterized by timely accomplishment of tasks,

5. Respect (Re), expressed towards themselves and towards others,

6. Positivity (Po), nobody wants pessimistic, be always optimistic,

7. Support (Spp), give others the opportunity to learn from you, support them,

8. Upgrading (Upg), be ready and open for constant upgrades,

9. Focus (Fo), always be focused on what you do, and

10. Active listening (AL), people want to be heard by you, and at the same time understand them (See below, Picture 3).

Picture 3. Pictorial view of the traits in the literature when it comes to professionalism in performing tasks

Whenever you are acting professionally, you strive to build trust at people, they will trust you, they will respect you. In sports, there is no rule that something needs to be done in a special way and that only that way can success be achieved. The exclusivity of one's approach and demonstration of sport, and especially the professional one at a high level, indicate the commodity of modern sport, the great, inexhaustible and varied approaches and propaganda of the game itself.

Implementation, adaptation and adaptation of experiences from other countries can only be successful and taken into account only with respect to our sociological and cultural characteristics, climate, customs, conditions, lifestyle and system of work in a particular sports club. And I will always repeat that the key to success in professional sports lies in ***professionalism.***

The rise of professionalism in sport of sportsman[5] **(Robert Vaux, 2010),** with competitors who earn a living participating in sports, has also elevated the notion of professionalism, or the proper behaviour of a sportsman. Ethics in athletic competition are of paramount importance because of the intense pressure to perform, the staggering amounts of money involved, and society's willingness to treat professional athletes as special or extraordinary people.

CONCLUSION

1. In Macedonia, sports management has been approached quite late, in last 10 years, most research papers and publications brought knowledge in the field, at different levels and in different situations, going beyond the sports organisations area, and their problems. Nevertheless, there are common points of view allowing us to conclude that the development of sport activities does not concern only structure, procedures, and systems within the organization of sports ,but also abstract factors, such as: leading style, team work, collaboration between different services or technical departments, staff motivation, without neglecting the problems of power and influence, coordination and conflict occurring inside an organisation, regardless of the type of provider organization.

2. In Macedonia, there is a need for new education system for sport management from starting from graduate studies, for reason student to have basic knowledge for sport management process, and through this to raise the level of professionalism in sport in our country.

3. No doubt: since decades elite sport needs well trained coaches, psychologists, special medicine doctors, physiotherapists and meanwhile also excellent managers. So, professionalism in coaching and managing is required. Meanwhile, emergent and developing nations with their governmental and nongovernmental sport organizations have the experience, that it is not enough to have top coaches for their national teams, they want more professionalism in as coaching and sport management. But in addition to professionals with a university study background, they need likewise well trained volunteers as instructors/coaches, leaders and managers.

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Enhancing the Customer User Experience Through a Feedback-driven Conversational Marketing: Encouraging Superior Engagement

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Abstract

Digital marketing trends cannot be ignored. Not too far ago, artificial intelligence was an ambitious notion with many doubters, however, today artificial intelligence is vanquishing global businesses. To create a competitive advantage business must employ and enhance its digital presence.

Today's marketing environment is more conversational. Customers want instant communication with businesses, brands, and so on. They expect direct feedback in real-time, as it impacts their buying decision process. Conversational marketing technologies allow businesses and customers to have one-on-one relationships.

The study uses a quantitative methodology. Through survey studies, the study will analyse the buying process through feedback solutions to better showcase the importance of engagement. Customer loyalty requires quality business decisions. The objective of the study is to showcase the customer user experience through a feedback-driven tactic that encourages superior engagement and great loyalty. The goal of conversational marketing technologies is intricating user experiences.

The study intends to showcase the importance of Al powered user experience in today's business environment. The study will present an analysis of feedback-driven tactics in conversational marketing. Any digital solution or new algorithms must be customer-driven and provide maximum experience. They must be feedback oriented as customers leave valuable information through the whole buying process.

Keywords: Conversational Marketing, Chat-Bots, User Experience, Digital Marketing, Alrificial Intelligence (Al)

1. INTRODUCTION

Artificial intelligence is injected into almost any type of business. Al is used for various business collaborations, employ and customer motivations, engagements, and so on. Not to mention for analyzing continuous feedback and calculating expected outcomes.

A continues feedback is a vital component of conversational marketing. It helps businesses to get engaged with communities. A continues feedback assists to analyze feedback received and make improvement decisions. Businesses' commitment to continuous feedback allows them to develop long-term loyalty.

Today, businesses already utilize artificial intelligence in basic communications, product communications, and content creation. Even in a digital environment, a business must know that the buying process starts well before the actual purchase and continues well after purchase. Therefore, the business must constantly analyze digital feedback.

Customers are constantly engaged in the buying decision process. If businesses do not know, they must know that customer is engaged in the buying process long before the actual purchase, and that buying decision has a post-purchase lifetime. In the Digital environment, conversational marketing can influence the buying process and gather post-purchase information to better user experience.

In the buying process customer constantly look for the information to evaluate alternatives. It is obvious that not all information is available on various networks, and there is a necessity for an instant, real-time conversation. In the digital environment, that's where chatbots come into play. Chatbots create a personal and real-time touch. Chatbot conversation has the power to influence consumer decisions from total-set through final decision. That's the power of conversational marketing.

Now, why feedback is relevant to create an excellent user experience? The simplest answer is that customers after every purchase have post-purchase behavior. They either choose to keep the product A, get rid of product A temporarily or/and get rid of product A permanently. All these three options provide data that business must analyze and create feedback-driven solutions. It is a cycle process, where business must constantly be on guard of customer experiences.

Conversational marketing technology has its skeptics. Not many believe that data obtained through digital feedback is valuable, whether customers provide right or wrong information. (Gentsch, 2019, p. 36) explains that content marketing and the relevant addressing of target groups have long been preached as the formula for success in marketing. Nevertheless, there always will be a risk associated with artificial technology and its developments. Businesses must analyze physical, social, psychological, financial, time, and so on risks while employing Al.

On the other hand, chatbots have advantages businesses must understand while creating a significant user experience. (Mankad, 2018) states that to fully benefit from this ongoing evolution, companies must consider the impact of digital communication and channels in their marketing plans. In today's global, digital environment user experience carries significant value. Yes, needs and wants are still essential, however, today, many assessments, developments and decisions are created around creating the valuable user experience. Chatbots jump out there as number one tool.

The advantages and disadvantages of chatbots in conversational marketing are as follows:

Table 1.1 Chatbot Advantages and Disadvantages

Advantages of Chatbots	Disadvantages of chatbots
Answers to simple questions	Answers to complex questions
24-hour service	Detailed/expert answers
Getting an immediate response	Friendliness and Affability
Straightforward communication	Complaints resolved quickly
A good customer experience	A good customer experience

Chatbots expected to answer simple questions that customers have. Chatbots can answer complex questions with detailed/expert answers, however, that does not mean that's the answer customer was expecting. Chatbots are a straightforward tool to provide 24-hour service, however, that does not solve complaints without influential involvement. The business will get the feedback, on which they must react. Chatbots create a user experience. (Garrett, 2011) explains that the practice of creating engagement, efficient user experiences is called user-cantered design. The concept of user-cantered design is very simple: Take the user into account every step of the way as you develop the product. The implications of this simple concept, however, are surprisingly complex.

2. LITERATURE REVIEW

Understanding digital marketing and strategies for online success is crucial. (Mankad, 2018) clarifies that the rapid evolution of information and communication technology – formally called as "digital era" continues to dramatically Change the practice and the strategies of marketing across all industries and businesses. (Mankad, 2018) continues that the digital marketing can be visualized as latest trend and modern era of business practice which involved the marketing of product, services, and some more valuable information.

Make no mistake: Return on investment is not less important than the power of the cliched "big idea" (Laffe, 2007). Corresponding to (Pradeep, Appel, & Sthanunathan, 2019, p. 1) marketing is still about reaching consumers effectively, informing them, persuading them, motivating them, and ideally bringing them back for more. Professor Michael Luck in (King, 2019, p. 1), states that AI is not a single technology. AL is a field; it's a whole band of

different technologies, some of which are really quite mature now. It's from those that we've seen some reasonable success in the media. But some techniques are not so mature; some are new, some still need a lot of work.

(King, 2019, p. 2), explains that AI has exploded into our personal and business lives since 2016 and is not the defining of our age. AI is a transformative force, and the pace of change is breathtaking and perpetual. (Pradeep, Appel, & Sthanunathan, 2019, p. 2) continues that today, the emerging and critical issue for marketers is not whether to use AI to address these challenges and many others, but which AI technologies and methodologies to use.

(Gentsch, 2019, p. 39) expresses that Algorithm-based technology platforms enable transparent and efficient media planning on the basis of artificial intelligence. He continues that AI and algorithms can capture a multitude of relevant active and reactive media data points and automatically assess them subjectively. According to (King, 2019, p. 6), over the coming years, machines and AI-embedded tools will complement the role that marketing professionals and their co-workers perform. While work will be available, adjustment will be essential, and continuous training and acquiring of new skills will be a focus a focus for all generations in the workplace.

(Johnsen, 2017, p. 15) claims that most of the breakthroughs in AI, are not noticeable to most people. AI is used in more subtle ways such as examining purchase histories and influence marketing decisions. (Pradeep, Appel, & Sthanunathan, 2019, p. 5) states that artificial intelligence is only as intelligent as the domain expertise contained in it.

(Cancel & Gerhardt, 2019, p. 3) dictates that by sticking to the old marketing and sales playbook, we have been forcing potential customers into an overly complex buying process. It's a process that fails to acknowledge the fundamental shit that's happened in the how people prefer to buy. They continue stating that today customers expect a company's website to be helpful, while more than a third of customers expect a company's website to be the most helpful channel, they use during the buying process.

(Lund, 2018) explains that content marketing, when done right, builds long-term relationships and drives meaningful action through conversation without your audience. It provides people with information that is valuable and relevant while it positions you as a trusted resource. According to (Cancel & Gerhardt, 2019, p. 9) without having to write a single line of code, marketers and sales people can now add chatbots to their websites that can provide answers to common questions, route visitors to the right people and departments, ask qualifying questions, and schedule meetings for sales reps. By using a combination of real-time messaging and chatbots on your website, you can easily replace lead capture forms with conversations.

According to (Lund, 2018) in a business marketing setting, effective conversation elevates content from a tired commodity to prose that motivates. (Cancel & Gerhardt, 2019, p. 11) claims that the future of marketing and sales will see businesses return to speaking directly to their customers and potential customers. Through abandoning the traditional marketing and sales playbook and embracing the power of conversations, we have seen revenue growth. (Cancel & Gerhardt, 2019, p. 14) explains that with conversational marketing and sales, you replace the forms on your website with conversations. When conversation starts, any contact information a lead enters can be captured automatically. This is true whether it's a human doing the talking or one of your chatbots.

(Williams, 2018) explains that chatbots are a new way to interact with a user in a more human way, through conversation. This is vastly different from existing methods, which provide minimal interaction or personalization. According to (Khan & Das, 2018) the classic definition of a chatbot is a computer program that processes natural-language input from a user and generates smart and relative responses that are then sent back to the user. Currently, Chatbots are powered by rules-driven engines or artificial intelligent (AI) engines that interact with users via a text-based interface. (Williams, 2018) continues that chatbots can be either voice or text-based interactions, allowing them to be integrated into existing websites and apps or used in phone calls and virtual assistants.

(Cook, 2020) states that asking the right questions and making sure your product or service meets the needs of your ideal customers is paramount to success these days. According to (Cancel & Gerhardt, 2019, p. 14) with conversational marketing and sales, you can capture and qualify leads within minutes, which means you no longer have to worry about leads slipping through the cracks in your website. (Lund, 2018) confirms that the secret sauce of content marketing isn't channel distribution, customer engagement, or key performance indicators. It's much simpler. It's how you speak with your audience-not only what you say, but how you say it. At the heart of this is "conversation marketing" – the intersection of one-to-one conversation and content marketing.

Corresponding to (Cook, 2020) at the heart of modern conversational marketing is artificial intelligence (AI). He continues that thanks to the growing popularity of chatbots deployed through message-based technologies (such as webchat, Facebook Messenger, and even SMS test messages) and artificial intelligence (AI), conversational marketing is now a reality and is already in place around the wen in countless industries. (Cancel & Gerhardt, 2019, p. 16) explains that when it comes to conversational marketing and sales, the rise of real-time messaging and intelligent chatbots have been instrumental to the creating of this new methodology – a methodology that puts the needs of the customer before the needs of the company.

A conversational marketing is there to understand and measure user experience through feedback. (Tullis & Albert, 2013, p. 5) explains that the user experience includes three main defining characteristics: a user is involved, that user is interacting with a product, system, or really anything with a interface, and the users experience is of interest, and observable or measurable. It is essential to understand the different between usability and user experience. (Tullis & Albert, 2013, p. 6) explain that usability is usually considered the ability of the user to use the thing to carry out a task successfully, whereas user experience takes a broader view, looking at the individuals entire interaction with the thing, as well as the thoughts, feelings, and perceptions that result from that interaction.

(Rosenzweig, 2015) claims that usability refers to the ease-of-use of a human-made object, digital or physical, or a combination of both. It is a part of the UX and is really the extent to which a person can use the object. (Garrett, 2011) states that user experience is the other, often overlooked, side of the equation-how it works- that can often make the difference between a successful product and a failure.

3. RESEARCH METHOD AND DESIGN

The goal of the study is to enhance the customer user experience through feedback-driven conversational marketing that encourages superior engagement. The study used a quantitative method. Through the survey, the study used a probability simple random sampling method. Respondents were selected from the specific target audience. The aim of the survey was not to divide respondents who have or have not interacted with conversational marketing, as it might have a biased result. The survey had 20 questions. The first 2 questions were about demographics; the next 18 questions were rating questions (multiple-choice, linear scaler, short answer).

4. RESEARCH OBJECTIVE

The objective of the study was the following:

1. Enhancing the customer user experience through feedback-driven conversational marketing that encourages superior engagement
2. Showcase the role and essence of artificial intelligence (AI) powered tools into businesses
3. Create additional awareness of artificial intelligence (AI), and explain it is not as bad as it sounds

5. STUDY FINDINGS

The target population of the study was respondents that did not have any pre-requisites on experience and knowledge in any particular field. All participants were supportive and enthusiastic to participate in the survey. They voluntarily provided their feedback to the asked questions in the study.

The data collection was conducted between February 11th, 2020 – March 21st, 2020. The population size for the survey was 150 participants, with a 20% response rate. From the estimates, the study received 106 responses, which is 70.6 % completion rate. Out of 106 respondents, 51 (48.1 %) were male, 52 (49.1 %) were female, and 3 (2.8%) chose “Prefer not to say”. The age distribution between respondents was: 2 (1.9%) “above 45”, 1 (0.9%) “40-45”, 22 (20.8%) “34-39”, 31 (29.2%) “28-33”, 34 (32.1%) “22-27” and 16 (15.1%) were ages between “16-21”.

The study asked respondents how much time did they spend on the internet? Figure 1.1 illustrates the following. From 106 respondents 39 (36.8%) spent “Between four to five hours a day”, 27 (25.5%) spent “Between six to seven hours a day”, 21 (19.8%) spent “Between two to three hours a day”, 9 (8.5%) spent “More than eight hours a day”, 7 (6.6%) spent “ one to two hours a day”, 3 (2.8%) spent “to one hour a day”. And finally, 0 (0%) responded: “I don’t use the internet”.

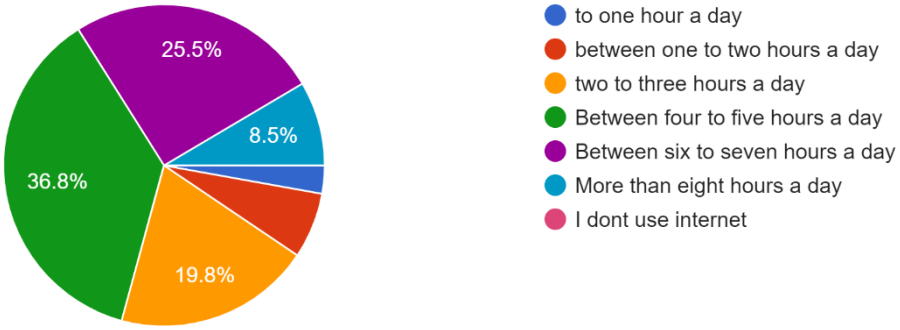

Figure 1.1 Time Spent on Internet

The study asked respondents to rate their User Experience, 1-being lowest, and 5-being highest. Figure 2.1 illustrates the following. From 106 respondents 57 (53.8%) rated “4”, 26 (24.5%) rated “5”, 20 (18.9%) rated “3”, 3 (2.8%) rated “2” and 0(0%) rated “1”.

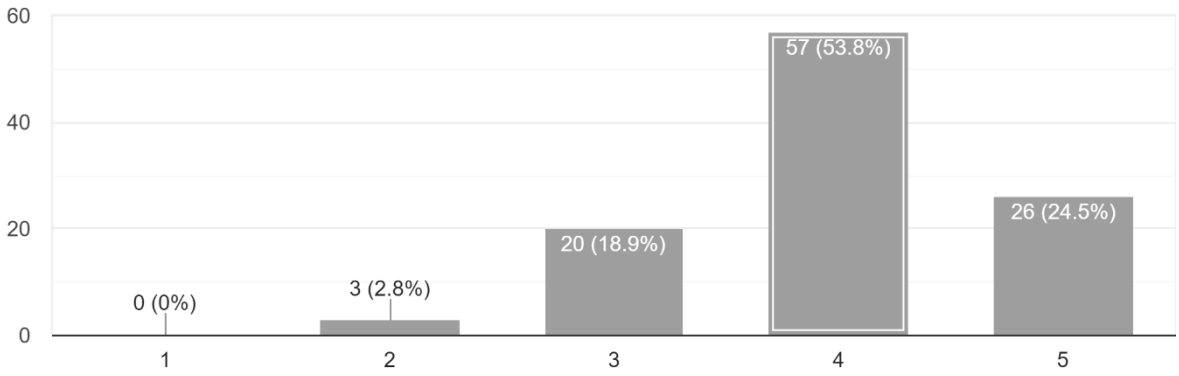

Figure 2.1 Rate User Experience

The study asked respondents to rank how important was it to receive instant answers from businesses on their questions, 1-being lowest, and 5-being highest. Figure 3.1 illustrates the following. From 106 respondents 45 (42.5%) rated “4”, 35 (33%) rated “5”, 20 (18.9%) rated “3”, 5 (4.7%) rated “2” and 1(0.9%) rated “1”.

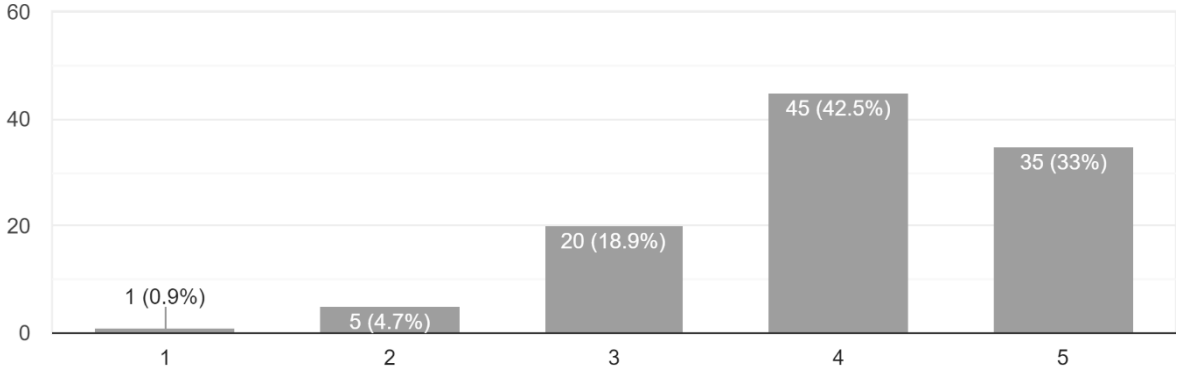

Figure 3.1 Importance of Instant answers from business on the questions

The study asked respondents to rank how important was the speed of response on their questions, 1-being lowest, and 5-being highest. Figure 4.1 illustrates the following. From 106 respondents 55 (51.9%) rated "4", 29 (27.4%) rated "5", 17 (16%) rated "3", 5 (4.7%) rated "2" and 0(0%) rated "1".

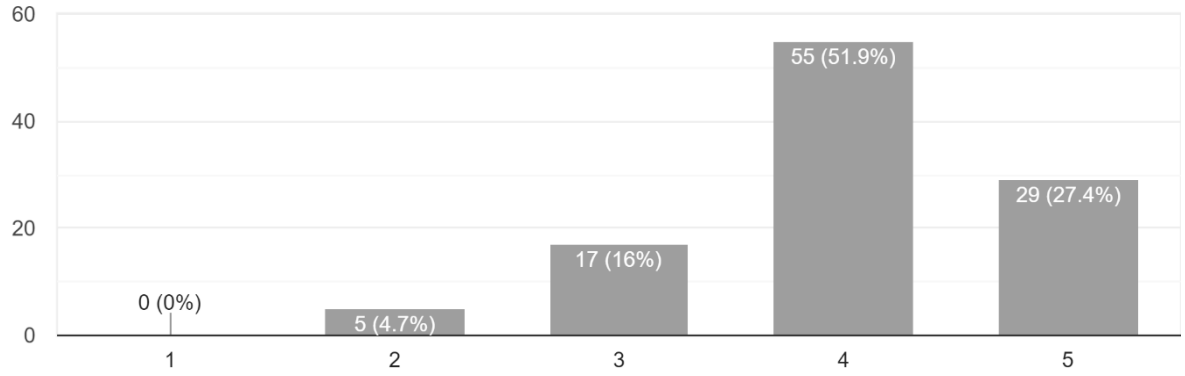

Figure 4.1 Speed of the response on questions

The study asked respondents to rank Chat-Bot Experience, if they have used it, 1-being lowest, and 5-being highest. Figure 5.1 illustrates the following. From 106 respondents 57 (53.8%) rated "4", 24 (22.6%) rated "5", 16 (15.1%) rated "3", 8(7.5%) rated "2" and 1 (0.9%) rated "1".

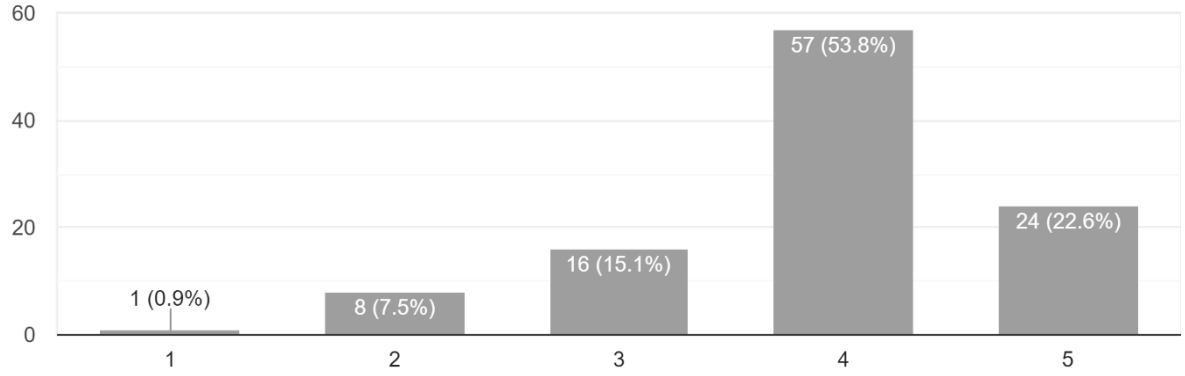

Figure 5.1 Rank the Chat-bot Experience

The study asked respondents if they have ever used Chat-bots? Figure 6.1 illustrates the following. From 106 respondents 72 (67.9%) said "yes", 21 (19.8%) said "maybe" and 13 (12.3%) said "no".

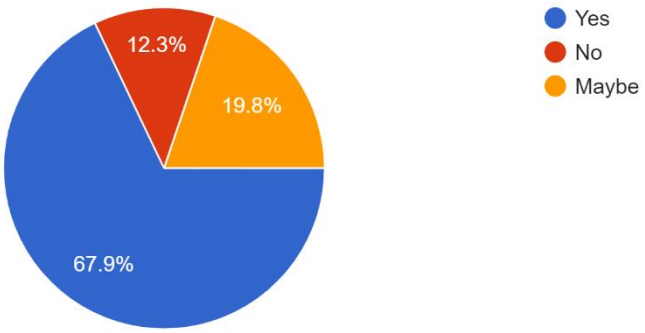

Figure 6.1 Have ever used Chat-Bots

The study asked respondents how often do they use Chat-bots? Figure 7.1 illustrates the following. From 106 respondents 43 (40.6%) used it "during the buying process", 21 (19.8%) used it " only if I need confirmation", 20 (18.9%) " Never use it", 13 (12.3%) "don't trust chatbots", 7 (6.6%) "almost every day", 2 (1.9%) says "I do not know chat0bots".

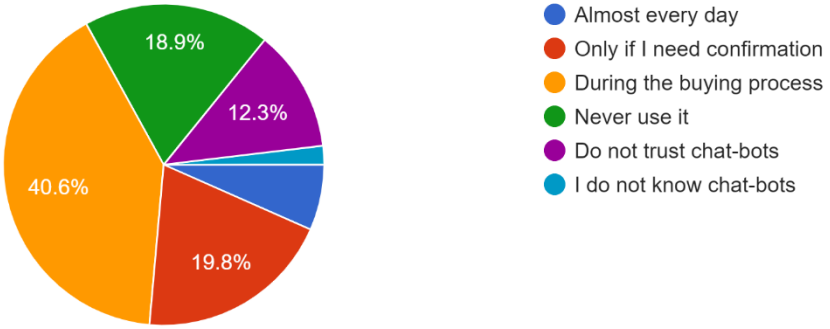

Figure 7.1 How often do they use Chat-bots

The study asked respondents if they trusted Chat-bots? Figure 8.1 illustrates the following. From 106 respondents 49 (46.2%) said "yes", 40 (37.7 %) said "maybe" and 17 (16%) said "no".

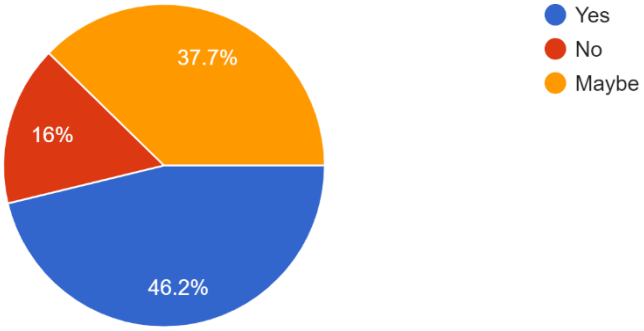

Figure 8.1 Have trust in Chat-bots

The study asked respondents if they have ever received follow up email or SMS for customer feedback? Figure 9.1 illustrates the following. From 106 respondents 52 (49.1%) said "yes", 34 (32.1 %) said "maybe" and 20 (18.9%) said "no".

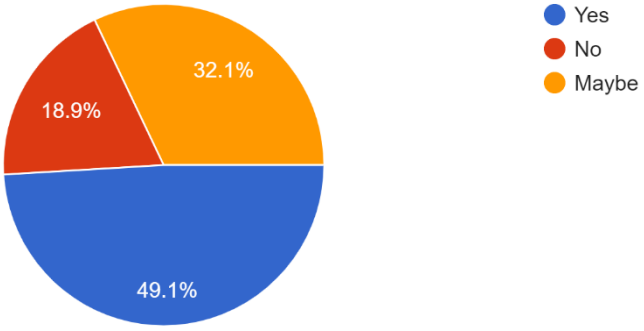

Figure 9.1 Received follow up email or SMS for Customer feedback

The study asked respondents if did they usually provide feedback to the businesses? Figure 10.1 illustrates the following. From 106 respondents 45 (42.5%) said "always", 23 (21.7 %) said "often", 22 (20.8 %) said "almost always" and 16 (15.1%) said "never".

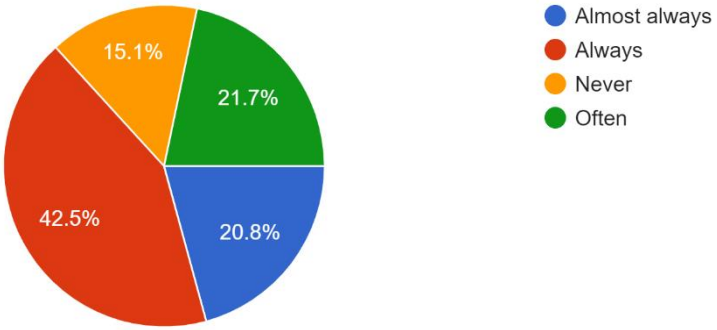

Figure 10.1 Provide feedback to the businesses

The study asked respondents how trustworthy their feedback was, 1-being lowest, and 5-being highest. Figure 11.1 illustrates the following. From 106 respondents 55 (51.9%) rated "4", 24 (22.6%) rated "5", 19 (17.9%) rated "3", 5(4.7%) rated "2" and 3 (2.8%) rated "1".

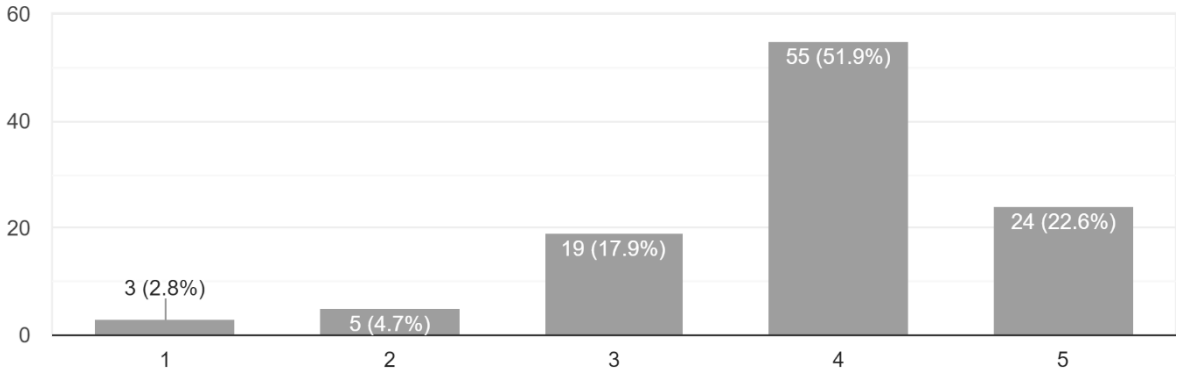

Figure 11.1 Trustworthiness of Feedback

The study asked respondents if they believed that businesses seriously consider and analyse their feedback? Figure 12.1 illustrates the following. From 106 respondents 47 (44.3%) said "yes", 42 (39.6 %) said "maybe" and 17 (16%) said "no".

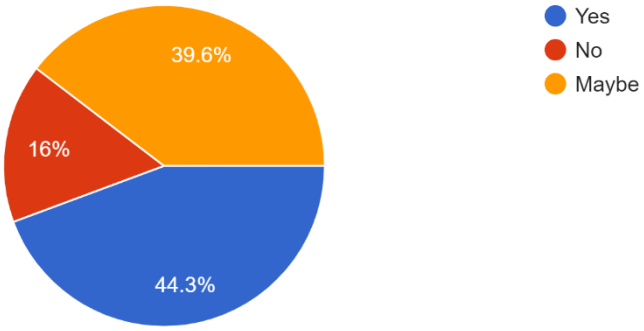

Figure 12.1 Business seriously consider and analyse feedback ratio

The study asked respondents how important was for them to have a conversation with businesses? Figure 13.1 illustrates the following. From 106 respondents 55 (51.9%) said “very important”, 25 (23.6) said “Not important”, 13 (12.3%) said “extremely important”, 13 (12.3%) said “on overage” and 0(0%) said “least important”.

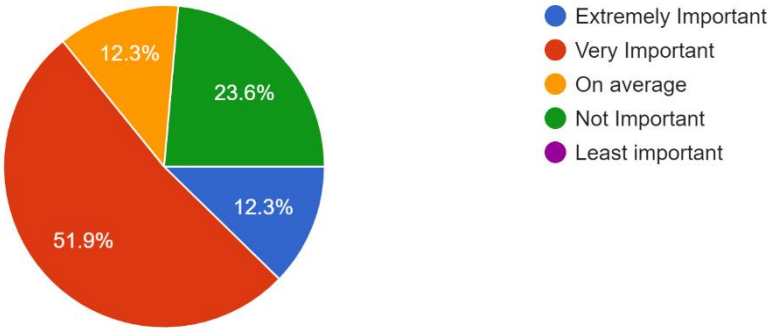

Figure 13.1 How important was to have a conversation with businesses

The study asked respondents what do they prefer chat-bot or organic (real person) conversation for their user experience? Figure 14.1 illustrates the following. From 106 respondents 55 (51.9%) says “as long as I get my answer”, 27 (25.5) says “chat-bot”, and 24 (22.6%) says “Organic (real person)”.

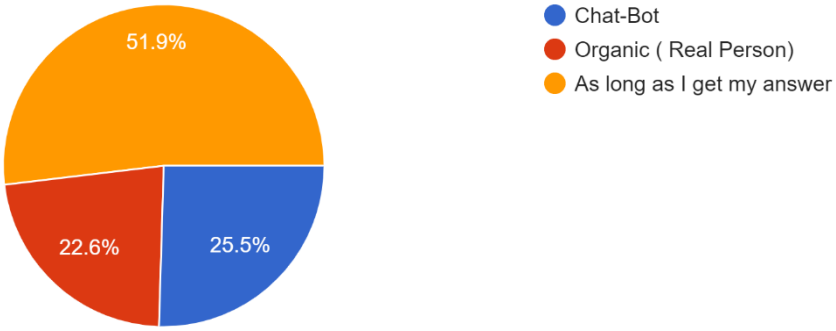

Figure 14.1 Prefer chat-bot or organic (real person) conversation for their user experience

The study asked respondents from where you feel more engaged into conversation. Figure 15.1 illustrates the following. From 106 respondents 33 (31.1%) said “Both”, 31 (29.2%) said “Neither”, 26 (24.5%) said “organic” and 16 (15.1%) said “Chatbot”.

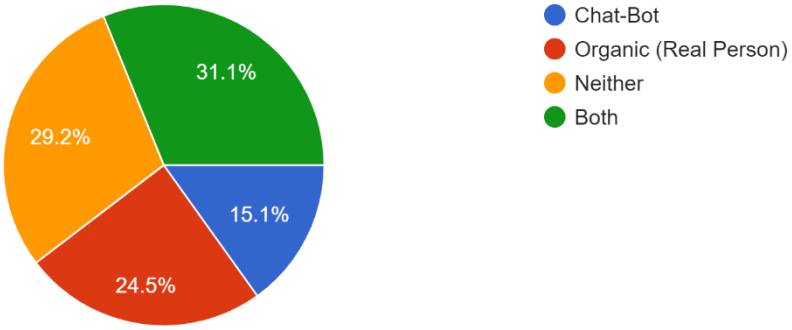

Figure 15.1 Engagement into conversation

The study asked respondents to rate following statements in relations to Chat-Bots. 1-being the least, 5-being the highest. From 106 respondents Table 1.1 illustration is next.

Table 2.1 Rating Chat-bot advantages and disadvantages

Chat-bots Statements	"1"	"2"	"3"	"4"	"5"
Chat-bots Answers to simple questions	7	16	24	26	33
Chat-bots provide 24-hour service	5	15	34	37	15
Chat-bots Getting an immediate response	6	19	31	39	11
Chat-bots provide Straightforward communication	4	18	39	32	13
Chat-bots Answers to complex questions	4	31	28	32	11
Chat-bots provide Detailed/expert answers	5	27	39	28	7
Chat-bots Friendliness and Affability	7	23	42	24	10
Chat-bots resolve complaints quickly	6	31	29	31	9
Chat-bots provide A good customer experience	3	13	32	28	30

The study asked respondents how valuable chat-bots for user experience were? Figure 16.1 illustrates the following. From 106 respondents 60 (56.6%) says "very valuable", 21 (19.8%) "on average", 13 (12.3%) "extremely valuable", 12 (11.3%) "less valuable" and 0(0%) "least valuable".

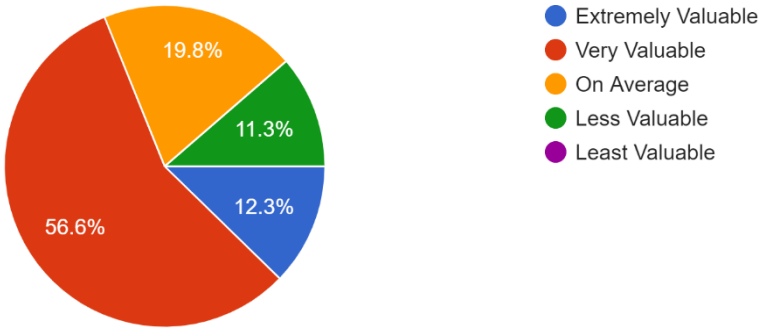

Figure 16.1 how valuable chat-bots for user experience were

The study asked respondents if they agreed that business power by Artificial Intelligence (Al) tool will wipe out human jobs. Figure 17.1 illustrates the following. From 106 respondents 45 (42.5%) "somewhat agree", 21 (19.8%) "mostly agree", 20 (18.9%) "in between", 20 (18.9%) "somewhat disagree" and 0(0%) "mostly disagree".

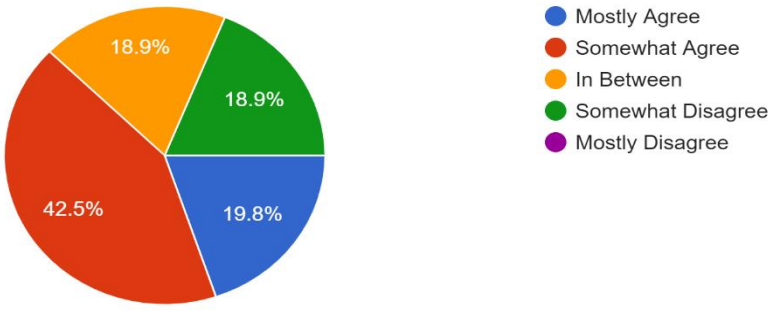

Figure 17.1 Agree or disagree that business power by Artificial Intelligence (Al) tool will wipe out human jobs

6. DISCUSSIONS

Enhancing the customer user experience through feedback-driven conversational marketing acquired a significance. Today, when never it is crucial to have a robust customer relationship through the buying process. Hence, a business must get customer feedback to develop customer feedback-driven solutions.

Artificial Intelligence (Al) tools have become a cornerstone for conversational marketing. Today, the business needs to have a conversation with customers. They must understand that customers are driving force in a competitive business environment. Customers are more knowledgeable, they have more digital tools, they want to compare alternatives in real-time, they expect 24-hour service, and so on. The list can continue on and on. In the end, only user experience makes a difference.

It must be noted that conversational marketing is a feedback-oriented approach that demands consumer engagement and effective user experience. It must be understood that digital user experience is not much different from traditional, however, in today's digital era, businesses and customers communicate with Al language.

Theoretical research gave an excellent punch to the study. From Figure 1.1 we saw that out of 106 respondents 39 (36.8%) spent "Between four to five hours a day", 27 (25.5%) spent "Between six to seven hours a day", 21 (19.8%) spent "Between two to three hours a day", 9 (8.5%) spent "More than eight hours a day", 7 (6.6%) spent " one to two hours a day", 3 (2.8%) spent "to one hour a day". And finally, 0 (0%) responded: "I don't use the internet". This result is a clear indication that today users spent on average five to six hours on the internet. It means that every single respondent sends a huge among of time browsing the internet no matter of gender and age. Now, take a moment and look on your smartphone's screen. Your screen time will show the amount of time you have spent networking with your device. That's without tablets, laptops or PC computers.

Above mentioned statistics is an indicator of how involved users are on the networks. Potentially, users spend time searching for information to make various decisions. In our case, the study elaborates on the buying process. The buying process starts long before the decision is made. The need or want for something is generated, and customers seek for the information. That information could be found on the world wide web, or customers must use support services, like chatbots. Quality information received assists them to make alternative comparisons and make a final buying decision. Now, in every single step customer leaves valuable feedback, which business must collect. The study believes that business must collect information after every user interaction, without a significant difference.

Table 3.1 One-way ANOVA

Descriptives

						95% Confidence Interval for Mean			
		N	Mean	Std. Deviation	Std. Error	Lower Bound	Upper Bound	Minimum	Maximum
RateyourOnlineUserExperience.1beinglowest5beinghighes	1	6	4.33	.516	.211	3.79	4.88	4	5
	2	19	4.11	.994	.228	3.63	4.58	2	5
	3	31	4.00	.775	.139	3.72	4.28	2	5
	4	39	3.95	.647	.104	3.74	4.16	2	5
	5	11	3.82	.603	.182	3.41	4.22	3	5
	Total	106	4.00	.743	.072	3.86	4.14	2	5
Howimportantisittoreceiveinstantanswersfrombusinesson	1	6	4.00	.894	.365	3.06	4.94	3	5
	2	19	4.05	1.079	.247	3.53	4.57	2	5
	3	31	4.10	.790	.142	3.81	4.39	2	5
	4	39	3.90	.968	.155	3.58	4.21	1	5
	5	11	4.18	.603	.182	3.78	4.59	3	5
	Total	106	4.02	.894	.087	3.85	4.19	1	5

Today, more and more people spend time on the internet. Therefore, potential business users continuously evaluate different purchase alternatives and seek for information. 38.8% of responders highly value their online user experience, which theoretically means that their questions are somewhat answered.

The high percentage of respondents indicated that they expect an instant response from businesses. Look on Table 3.1 that demonstrates how five age groups rank user experience, and the speed of response. In the customer decision making process, during the total set, customers have many alternatives. In the awareness set, they are aware of some but do not necessarily know. They need information instantly to move to the next, consideration step. Even in this stage, customers are evaluating and expect fast-paced responses from businesses. The response did indicate that response speed has important value during the buying process. Now, if we evaluate both sides, we understand that everything is interdependent. However, businesses must understand the power of customer behaviour. Business does not have the right to ignore customer requests. That's where the power of conversation, storytelling and content building comes into the game.

The study considers that Chatbots have become an important tool for businesses. Chatbots are used almost in every business. Today, businesses do not have to write special programs, or codes to create chatbots. Different applications are widely available, which businesses utilize. In the study, 67.9 % of respondents have used chatbots, and they value their user experience high. Yet, the study does not believe if it is a direct indication that people are satisfied with what chatbots do.

In the study, respondents mentioned that they often use chatbot during the buying process. That's another hint of how much customers examine alternatives during the buying process. The emergence of high-level conversations is a must. It might generate amplitude of loyalty and confidence withing customers. It might be a good loyalty builder. Respondents stated that they use chatbots when they need some type of information confirmation. In the study, respondents did mention that they do not trust chatbots. It raises the question, if no trust into chatbots, why do they use them anyway? Does it carry additional value? How does customers process information receive from chatbots? 46.2% of trust ration into chatbots sets some alarms to think about.

On the other note, customer feedback in creating a valuable user experience is vital. Businesses have become smarter and send follow-ups to customers. However, there is a dilemma of how efficient that feedback is? The study was interested in seeing how the respondent behave when they received email or SMS for feedback. Many respondents agreed that they receive follow-ups. Most respondents insisted that they always respond and provide feedback. The study asked respondents about trustworthiness. Figure 11.1 illustrated that out of 106 respondents 55 (51.9%) rated "4", 24 (22.6%) rated "5", 19 (17.9%) rated "3", 5(4.7%) rated "2" and 3 (2.8%) rated "1". That's a good indicator, however, the study has doubts. The study believes that many customers typically respond positively to questions, for certain benefits. It is one of the hardest condition's marketers must operate. They must take feedback seriously, and at the same time thinking critically. Businesses need creative solutions. The study asked the next question, whether respondents believed that business does take feedback seriously. Again, the response was the mixture of answers with no clear belief. The study believes that businesses must do a better job in seeking feedback, while customers must be more honest (which is a very hard sell).

The study understands that businesses must make no mistakes when communicating with customers. They must genuinely invest time and resources into creating a long-term customer relationship. It is not only good to engage new customers but is a cornerstone for retention. The feedback approaches must be consistent. The big data received must be structured for future developments. The product life cycle is not long. To have a competitive edge, businesses must provide need products or services, and feed the life cycle.

The study agrees that customers want to have a conversation with the business. For respondents it does not matter is they conversate with chatbots or real people. The importance is stressed on getting the answers to their questions. In the study, respondents almost equally decided that whether its chatbot or organic or both, they need answers in real-time. If the study takes the demographic environment into consideration, that might be true. Generation Z is more technology bound and expects many activities done via digital platforms. So, their expectation is 24-hour service and real-time responses.

The study used the trick with respondents. Respondents were asked to rate the advantages and disadvantages of chatbots. Chatbots are a vital tool in conversational marketing. It enables the opportunity to receive necessary information from customers to long-term communications. From table 2.1 respondents do not give any particular significance to advantages and disadvantages. The study understands that respondents still have a mix-feeling about

chatbots as well as having Al in context. However, a business must continue evaluating platforms and learn where and how customers get engaged. The future is in digital developments; however, a business must understand that everything is created based on traditional approaches. The respondents believe that chatbot experience is very valuable while staying confused about if Al will wipe out human jobs. 42.5% of respondents believed that is a possibility.

7. CONCLUSION AND RECOMMENDATIONS

Today customers want more. They need to be engaged in the buying process. Alternatives are evaluated rapidly which demands the need for conversational marketing. In the sales methodology, the role of 24-hour and real-time communication is the must. Businesses are embracing new realities.

The study understands that to effectively engage customers, businesses must concentrate on conversational marketing, which is a feedback-driven approach. Businesses must comprehend how important is it to hear your customers. Businesses must explore what and how customers behave. They must acknowledge the information received and provide genuine feedback. Businesses must refocus and show customers that the feedback matters.

Any digital solution or new algorithms must be customer-driven and provide a maximum user experience. Businesses must create effective and efficient conversational channels, where customers receive 24-hour feedback. It must provide immediate responses, however, it must personal. From the theoretical studies, Al algorithms are getting more and more unique which provides more personal feedback solutions.

The biggest recommendation that the study provides is that businesses must be open to the challenge and accept Al algorithms into business solutions. If they already do it excellently, however, if not, try and give a chance.

The second recommendation, the study provides is that the time of mass marketing is over, therefore it does not mean that traditional marketing approaches are over. They are still there but digitalized. For that reason, the business must apply conversational marketing and constantly stay engaged with conversations.

Third, but not least recommendation, the study provides is that customers might fear Al, which stresses the role of customer engagement. Engaged customers tend to easily adapt to algorithm solutions. Build engagement in the backyard, and slowly expand the horizons. Businesses must build communities.

At last, the study believes that it answered the study problem of enhancing the customer user experience through feedback-driven conversational marketing through engagement. The study showcases the relevance of conversational marketing in today's digital environment.

The idea behind artificial intelligence and chatbots into conversational marketing is not to eliminate jobs. It is to better competition while eliminating hidden factories, such as repetitive tasks. It supplements marketers, salespeople, and business. As simple is it, chatbots answer common questions that many users have.

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The Organizational Performance of Sales and Distribution Models in the Automotive Industry in Interaction with Management Attributes

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Abstract

Discontinuity and Convergence in the automotive business sector show the relevance of new business models. Timeframes of new business model conceptions are small, and the management is challenged so to occupy new business segments. Automotive producers operate in multiple contexts because they produce and sell in differential regions and nations, and strive for economies of scale, to establish unique competences and considering local requirements. Leadership of automotive industries is facing complex changes and must react with fast, future-oriented decision-making related to new business models and based on sustainability. The German OEM during the last 20 years and its implications show the stable and traditional business behavior. This radical transformation from old to new business model demands for an adequate change management, and decision making is necessary by the whole management, and moreover, hierarchies and processes, like production, maintenance, sales, and aftersales must be changed strategically and radical. Thus, in cases of radical change resistance of stockholders, managers of all lines, and the staff is expected. The research objective is to evaluate the key deliverables in business model change.

Keywords: Leadership, decision-making, organizational structure, performance, cultures, business-models

1. ACTUALITY OF THE TOPIC

Dynamic developments and changes are characterizing the automotive markets worldwide. Therefore, organisational survival is essential in today's economical world. Discontinuity and Convergence in the automotive business sector show the relevance of new business models.[1] Due to the pressure of new business opportunities and changing environmental and technological developments new business models are in focus of this article. Timeframes of new business model conceptions are small, and the management is challenged so to occupy new business segments, and to foster technological innovation. System oriented innovations have a great impact on organizational structures, leadership roles and decision-making effectiveness on the organizational performance.[2] The aim of these business innovations are to create values for customers to foster the organizational market position and to maximize profits, but they are accompanied by technological and market expectations uncertainness.[3]

[1] Cf. Ghaziani & Ventresca (2005), p. 541.; Lambert & Davidson (2013), p. 671.
[2] cf. Lambert & Davidson (2013), p. 677.
[3] cf. Schneider (2012), p. 41 et seqq.

Based on the fast rhythms of organisational environment, technological discontinuity, and reduced lifetime circles of changing economic competition, the transition from management to leadership led to new organisational developments, modifying behaviours and expectations. The corporate innovative ability is a central factor of success for long-term positive organisational development.[4] Moreover, the actual worldwide crises of Corona Virus, which impacts automotive industry extremely, shows management has to consider new ways of action. According to Hambrick & Mason, the strategic situation of decision-making provides stimuli that undergo filtering processes and narrow the cognitive bases to direct attention that are more likely to be in line with their preferences and past experiences.[5] Cannella, Holcomb underline that the model of upper echelons is of a multi-level nature because it describes the decision-making processes of groups and individuals.[6] The authors criticise it, however, as being an incongruent application and a mix of different levels of theory, measurement, and analysis.[7] Moreover, Peterson, Martorana, Smith, & Owens argue that there is a lack of specification as to how a leaders achieve a decision.[8] Although the impact leadership decisions to organisation's success have been in the focus of research, the characteristics of top managers are often neglected, strategically and contractually.[9]

According to a study of PWC cars in future are electrified, autonomous, shared, connected and yearly updated. [10] Cars in future will emit less exhaust fumes and noise into environment, due to electrification and they will take up less personal time and space because of its autonomously move. Moreover, no driving licence will be accessible, and the cars will be more affordable because in future they must not be bought but can instead be paid for use in small amounts.[11] An unprecedented change is facing the automotive sector regarding to far-reaching effects which will occur for industry and users. Squeezed by intense competition - increasingly from new competitors in low-cost countries - as well as industry overcapacity, high labor costs in mature markets and customer resistance to price increases, automotive companies must establish sustainable and flexible cost structures, driving them to relocate global sourcing to "low-cost" regions, Asia, in particular. Forty-four percent of executives cited locating global sourcing to low-cost countries as a top priority for their organizations. In addition, as they establish optimal global manufacturing capabilities, automotive companies also must refine their product development strategies to respond to the demands of these emerging markets. To sum up leaders of the automotive industries are affected from environment and the impact of the whole value chain, which is shown in the following illustration:

Carmakers are faced with increasing urbanization and expanding public transportation, they are also faced how should their cars be designed. Should they connect to electric vehicle with technology push or market pull strategies and should OEMs produce batteries for e-cars themselves. One further decision is if carmakers should sell their cars directly to customers, how should they recapture their technology chain, and to what extent should they integrate suppliers.[12]

New leadership competences are strongly needed for strategical and operational change within the automotive industries. Digitization, new technologies, more demanding customers and dynamic markets question traditional business models and demand for a high degree of innovation and agility. The fundamental paradigm change of the existing business filed models have a need for a qualitative framework of leadership which is focused in this article. Especially, new leadership methods in the automotive industries have a need for a more and more sustainability and stability related to customer satisfaction.

[4] cf. Klein (2002), p. VII.
[5] cf. Hambrick & Mason (1984), p. 195.
[6] cf. Hambrick & Mason (1984), p. 203.
[7] cf. Hambrick & Mason (1984), p. 204.
[8] cf. Peterson et al. (2003), p. 795.
[9] cf. Schrader (1995), pp. 2 ff.
[10] cf. PWC (2018), p. 6.
[11] cf. PWC (2018), p. 6.
[12] cf. Deloitte (2017), p. 8.

2. TRANSFORMATION

PWC sees that the transformation of the automotive industry is driven to a large extent by younger and technically savvy generations and that manufacturers and suppliers must expand their business models to cover operational elements. Classic target figures of the sector, like vehicle sales and vehicle inventory will be less important and the figures will change over the coming years.[13]

> "Getting the business model right is critical to the success of a new business; adjusting and/or improving the model is likely to be critical for continued success. However, the importance of "business models" has been largely neglected in the management and economics literature, at least until recently. [14]

Automotive producers operate in multiple contexts because they produce and sell in differential regions and nations, and strive for economies of scale, to establish unique competences and considering local requirements. Local requirements and global integration are in opposition to each other. Thus, besides operation in multiple contexts these facts increase organizational complexity and uncertainness. The management of new business models in multinational organizations has been researched, inadequately. [15]

This article is focussing to reveal the research gap between internal and external factors influencing the organizational context in the automotive industries regarding leadership role, decision making, organizational structure and effectiveness in creating an adequate business model. The research differentiates between old and new factors and externally, especially for the European automotive industries. The starting model for comparison are Tesla with its new market attempt, but further developments of other sectors are included. Based on these results the European automotive industries are compared to US and Asian (Japan, South Korea) automotive industries and their leadership roles and effectiveness focussing published financial statements and statistics of sold cars. Therefore, institutional behaviours are critically questioned for effectiveness according to the pressure of external factors: changing social and consumer behaviours and changing sustainability prospects and moreover new technologies and new statutory frame conditions.

Based on the compared results of internal and external factors, and moreover considering trends (based on market data) and prospects new leadership roles, structures and decision making for future oriented organizational effectiveness in the automotive industries are developed. The research of this study is limited on the presented internal and external main factors. Especially the management of automotive producers must consider consumer-friendly new business-models. Focusing on Teslas new thinking, and broaden this idea, new management methods for these new business-models are worked out in this article.

3. PURPOSE

Leadership of automotive industries is facing complex changes and must react with fast, future-oriented decision-making related to new business models and based on sustainability. Therefore, leadership must combine organizational performance with sustainability, which demands for new leadership methods, based on a holistic view connected to customers' needs and expectations. System innovations can be understood as radical change or emergence of a new economy sector. Economy sectors are socio-technical systems, with patterns of regulations, actors' configurations and interaction relationships which are centred in an economically work section. [16] Industrial 4.0 transformation based on holistic solutions is based on six dimensions: Dimensions of users, dimension of enteprise, dimension of processes, dimension of applications, dimensions of physical assets and dimensions of infrastructure.[17] To demonstrate what benefits can be achieved with a new business model the common OEM model is compared to Tesla and the new model of this article:

[13] cf. PWC (2018), p. 14.
[14] Augier & Teece (2007), p. 182.
[15] cf. Johnson, Christensen & Kagermann (2008), p. 53.
[16] cf. Dolata (2011), p. 18.
[17] cf. Hiralal (2017), pp. 1 et seqq.

4. LITERATURE

In research and in practice new leadership models and roles are deeply discussed, as there is a demand for leaders and new methods to manage the huge paradigm change in the automotive industries. In the following table studies and research articles are presented, dealing with these focuses.

Table **Chyba! V dokumentu není žádný text v zadaném stylu.**: Studies and research about leadership, organizational structure, success in future[18]

Year	Author(s)	Study/Title
2009	Muller, M. L.	Current automotive industry: how one leader practices CI
2009	Omar, M.; Mears, L.; Kurfess, T. Kiggans, R.	Organizational learning in automotive manufacturing: a strategic choice
2011	Golinska, P. & Kawa, A.	Remanufacturing in automotive industry: Challenges and limitations
2013	Stocchetti, A.; Trombini, G. & Zirpoli, F.	Automotive in transition. Challenges for strategy and policy
2013	Mazur, C.; Contestabile, M.; Offer, G. J. & Brandon, N. P.	Understanding the automotive industry: German OEM behaviour during the last 20 years and its implications
2014	Deloitte University Press	3D opportunity in the automotive industry. Additive manufacturing hits the road
2014	Dieterich, J.	A quantitative analysis of Consumer Behaviour in relation to Electronic Cars resulting in a new Green Marketing approach for the German car industry
2015	Sandu, M. C.	Reputation – an Important Element for Automotive Industry Profit?
2015	SpencerStuart	How the auto industry can secure the right blend of talent to succeed in the era of the connected car
2016	World Economic Forum	Digital Transformation of Industries Automotive industry
2017	PWC	Five trends transforming the Automotive Industry
2017	Vaz, C. R.; Rauen, T. R. S.; Lezana, A. G. R.	Sustainability and Innovation in the Automotive Sector: A Structured Content Analysis
2018	Roland Berger	Global Supplier Study 2018. Transformation in light of automotive disruption.
2018	Saberi, B.	The role of the automobile industry in the economy of developed countries
2019	PWC	Indian automotive sector: Creating future-ready organisations
2019	McKinsey	Race 2050 – A vision for the European Automotive Industry
2019	Capgemini	Accelerating automotive's AI transformation: How driving AI enterprise-wide can turbo-charge organizational value

Advances in additive manufacturing, digitization, changing consumer demand and environmentally sustainability open new doors for the automotive industries. These new doors are connected with risks like huge investments in fast changing markets. Moreover, inside organizations changes occur professional workers are replaced with robotics, and

[18] Source: own illustration

more and more productions are sourced out. Overall, consumers and stakeholders are clairaudient for all organizational changes due to social media and networks. These are only a short description of managerial challenges which leaders are faced actually and in future. Organizational development can be steered expeditionary, systemically, classically or straight proportionally in times of racy changes.[19] The findings of a study shows the German OEM behaviour during the last 20 years and its implications show the following factors: [20]

- Changes in the automotive industry occur only if significant external pressures arose
- The main drivers for change are regulations and consumer pressure
- New solutions are only created through combinations of internal solutions
- In case of external pressures disruptive changes are triggered related with disruptive and internal events
- Less familiar technologies and knowledge are obtained from third parties

These factors elaborated lead to the critical questions which changes do consumer prefer and what impact do crisis like Corona have on the development of the new business model. The following table shows the new major industry participants in comparison to traditional peers and new entrants.

Table 1. New Business Opportunities using the new business model: Major Participants of automotive industry - compared[21]

					Non-traditional Industry Segments	
	Tier 1 Auto Suppliers	Auto Manufacturers	Retailers	Aftermarket	Connectivity and Media	Mobility on Demand
Traditional Peers	• Magna • Continental Automotive Systems U.S. • Robert Bosch etc..	• Toyota, • Daimler, • Ford, • Honda	• Penske, • Imperial • Euromaster etc.	• Advance, GPC, Relko	• Traditional Radio Broadcasting • Stored Media (CDs, USBs)	• Radio Taxes • Yellow cabs etc..
New Entrants	• Windows Embedded, here, Mobileve	• Google, Apple, Cruise etc.	• Tesla, • TrueCar	• Ebay, • Amazon, • US-autoparts	• Spotify, • AT&T, • Apple, • Telecom	• Lyft, • Hertz, • Uber etc..
New Business Opportunities used by the new business model	• Growing relevance of digital component for features of interaction, connectivity, and automation	• Digital companies • Creating self-driving cars • Converting regular cars into self-driving • Creating 3D-printed cars	• B2C retail witnessing rise of online portals offering reviews, comparisons and other information to guide purchase behaviour	• E-commerce substituting traditional channels • Advent of preventive and at-your-doorstep services	• Media and Connectivity providers creating a customized in vehicle digital ecosystem	• Transport services shifting mindset around vehicles as series to be consumed cs. Products to be owned

Thus, digitalization changes the automotive industry in a disruptive way and breaks established rules of the business models of the past. Innovation and creativity lead to more risk-taking behaviour but offers new ways for better value creation.[22] Technology improvements are expected like connected objects, shared connections, data, robotics, anticipation and an overall self-aware feeling.[23] The top digital transformation trends in the automotive industries are considered in this article in order to create competitive advantage through customer satisfaction:[24]

[19] cf. Heimerl & Sichler (2012), p. 266.
[20] cf. Mazur et al. (2013), p. 1061.
[21] Source: own illustration based on Petrucci-Vaquero (2018), p. 18.
[22] cf. Petrucci-Vaquero (2018), p. 18.
[23] cf. Petrucci-Vaquero (2018), p. 19.
[24] cf. Newman, D. (2017), w. p.

- Digital sources in the car buying process
- Autonomous driving
- Predictive maintenance
- Connected supply chain and improved manufacturing
- Mobility-as-a-service (MaaS)
- Date security and protection

The additional factor in the new business model is to intense customer satisfaction based on various subfactors:

- Faster sales (Booking on internet directly by the producer, so that delivery time and costs are reduced)
- Supplementary equipment which can be booted from the supplier based on digitalization processes
- Full maintenance package with car changing (no lost time through maintenance)
- Included maintenance fees,
- Included insurance fees,
- Included energy costs
- Consumers must not buy they only pay for vehicle use
- Economical assistance (financing, only pay per use, et seqq.)
- Model changing within one day if desired (in case of use in town or fields and meadows par example)
- 7/24 support in all car belongings

This radical transformation from old to new business model demands for an adequate change management, and decision making is necessary by the whole management, and moreover, hierarchies and processes, like production, maintenance, sales, and aftersales must be changed strategically and radical. Thus, in cases of radical change resistance of stockholders, managers of all lines, and the staff is expected. Nevertheless, the change has to be executed within a short timeframe, to achieve competitive advantage. Therefore, analysis of the change factors externally and internally must be established immediately to work out possible strategies of realisation.

5. RESEARCH DESIGN

Research methodology is based on the strategy to answer the predefined research questions and the hypothesis[25] and it is divided into two main aspects: Firstly, a literature review about managerial cognition, culture, organization, and organizational performance is performed. Secondly, based on the theoretical results an empirical research approach is conducted. The empirical approach enfolds a questionnaire directed to managers and qualified employees of manufacturers and subcontractors of the automotive and similar industries. Moreover, relevant research results of other business segments are used for verification. Furthermore, the development of classical automotive producers and producers which react with new business models (like Tesla) are quantitatively compared, so that pros and cons can be revealed.

The research design is grounded on critical rationalism, where the deducted framework is tested in an empirical environment. According to Popper we actively try and work out methods of trial and error and this is the only method we have to use.[26]

6. RELEVANCE

Environmental prospects influence organisations' behaviour and "…the formal structures of many organizations in post-industrial society […] dramatically reflects the myths of their institutional environments instead of the demands

[25] cf. Maylor & Blackmon (2005), pp. 26-27.
[26] cf. Popper (1995), p. 130.

of their works activities", as noted by Meyer & Rowan.[27] Organisations are systems of individuals which operate and act to achieve formulated targets.[28] Petzold underlines that organisations are individual networks and added that organisations are groups or social entities, based on cooperation frameworks, which are aimed at reaching long-term goals to achieve organisational survival.[29] Therefore, organisations are patterns of relationships with common goals, and the organisational structure divides, organises, and coordinates organisational activities.[30] (Drumaux, 2007, p. 4). Due to the fact that automotive industries act internationally and globally leaders and their decision-making is connected with intercultural aspects. The culture of the organization itself and the culture of all related market members.

This article analyses which factors and organizational structures influence leaders in their decision making and which leadership roles and methods are appropriate to raise organizational performance and effectiveness in developing new business models. The following presented cause-effect-model describes the focus of this article.

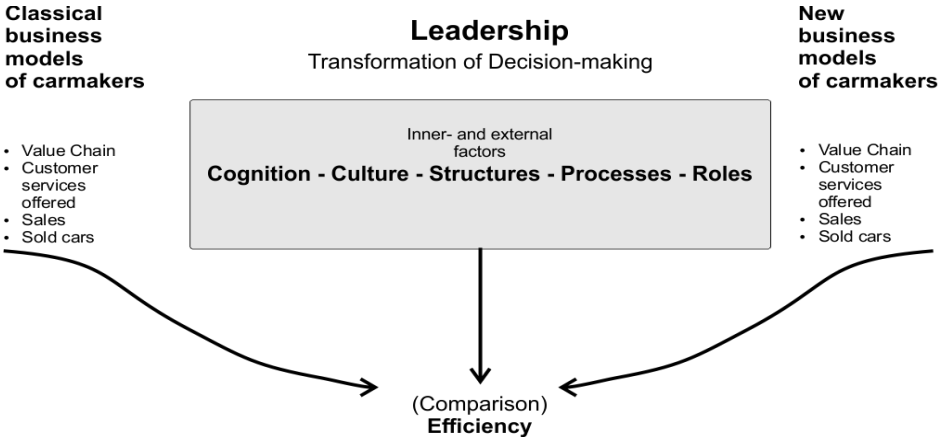

Fig. **Chyba! V dokumentu není žádný text v zadaném stylu.**. Business models, Leadership, Organizational structure, influencing factors and organizational performance[31]

7. RESEARCH OBJECTIVEA: QUESTIONS AND HYPOTHESES

Due to the topic relevance section the following research questions should be answered with this article:

Research question 1: What factors influence leadership decision-making?

Research question 2: Which leadership roles are related to the dramatic and complex changes in the automotive industries?

Research question 3: How should leadership respond to intercultural, technological and environmental changes to achieve a better organizational performance?

Based on the theoretical implication and the worked-out research questions the following hypotheses are formulated.

The hypothesis H0 is the main hypotheses and due to the fact that external and internal factors are influencing leadership roles and decision making the questions occurs

H0: Leadership role and decision making is influenced from the cognition of the manager more from external than internal factors.

Hypotheses H1 and H2 are sub-hypotheses. They connect leadership role and decision making due to the organizational performance.

[27] cf. Meyer & Rowan (1977), p. 341.
[28] cf. Schimak (2001), p. 200.
[29] cf. Petzold (1998), p. 399.
[30] cf. Drumaux (2007), p. 4.
[31] Source: own illustration

H1: High performance organizations are better prepared for disruptive changes and therefore react faster than low performance organizations.

The hypothesis 2 is a control hypothesis to H1 and H0:

H2: Managers of low-performance organizations do have a different cognition about success in contrast to managers of high-performance organizations, and therefore they do not push change.

8. CONCLUSION

Based on theoretical literature review and in addition with empiric results of questionnaire and online research of empirical data (comparison) the presented research questions and hypotheses are answered. The impact of this article overhands theoretical and empirical results to formulate and presents leadership recommended course of actions for practice and enhances actual theoretical knowledge.

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Factors Shaping Individual Employee Performance: Role of Employees' Entrepreneurial Orientation, Mutual Trust and Organisational Commitment

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Abstract

Purpose – The aim of this paper is to identify the role of employees' entrepreneurial orientation, mutual trust and organisational commitment in shaping individual workplace performance.

Design/methodology/approach – The paper is structured as follows: First, multi-levelness in the analysis of entrepreneurial orientation within an organisation was presented. Then, it was discussed how entrepreneurial orientation manifests itself as a phenomenon at the individual-employee level. With regard to above explanations, it was analysed how and why entrepreneurial orientation may be linked to individual workplace performance. Finally, it was discussed why mutual trust and organisational commitment are important concepts for research on entrepreneurial orientation at different levels and units of analysis.

The method used for performing empirical research was CAWI (Computer Assisted Web Interviews). The effective research sample included 926 employees hired in two enterprises. The conceptual framework for this research was constituted by the social exchange theory as well as the theories of organisational citizenship and extra-role behaviour. The project was founded by The National Science Centre in Poland allocated on the basis of a decision DEC-2014/15/B/HS4/04326.

Findings – The results obtained under two surveys (478 employees in an IT sector enterprise and 448 employees in an electro-energy sector enterprise) revealed that extra-role entrepreneurial behaviour of employees is positively associated with workplace performance at the individual employee level. Moreover, this research provides the knowledge about mutual trust and organisational commitment in determining workplace performance at the individual employee level.

Research limitations/implications – Such issues as how employees' entrepreneurial orientation and individual performance may accumulate and aggregate themselves to the organisational level were not established. Regarding future research directions, further research should be undertaken to analyse the relationship between employees' entrepreneurial orientation and workplace performance at the individual employee and team levels in various industries across the country and longitudinally at different organisational levels.

Keywords: employees' entrepreneurial orientation, mutual trust, organisational commitment, individual workplace performance

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Engineering, Transport, IT and Artificial Inteligence (IAC-ETITAI 2020)

Selected Environmental Protection Equipment in Railway Transport Infrastructure

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Abstract

Environmental protection equipment in rail transport infrastructure is part of the environmental protection process. Railway infrastructure is the railway equipment and facilities in their interconnection, enabling the safe, regular and continuous movement of rolling stock. In order to improve the state of the natural environment, a number of activities are carried out to protect it along with legal regulations. The paper discusses selected environmental protection devices in the rail transport infrastructure for environmental protection, focusing primarily on devices designed to combat noise. Attention was paid to the development of strategic noise maps. These studies are drawn up for the overall assessment of noise exposure from the various sources in a given area, as well as for the purpose of making overall forecasts for the area. Both environmental protection devices and strategic noise maps are directly reflected in civil engineering and transport works with elements of surveying works. In the field of installation and exploitation of acoustic baffle (acoustic screens, noise barriers) they are applied to all kinds of surveying works. A map of noise sensitivity of railway areas in Poland is presented, developed in the portal Interactive Map of Railway Lines. These works in the process of shaping the condition of railway infrastructure are of particular importance in environmental protection devices as a whole in the market economy system. The paper presents the author's observations and conclusions and was made as a part of statutory research of AGH University of Science and Technology No. 16.16.150.545.

Keywords: acoustic baffle, noise barriers, rail damper, strategic noise map, environmental protection devices, surveying works

1. INTRODUCTION

In newly built, modernised and revitalised railway lines, objects associated with the reduction of environmental impact are of great importance. Noise is a harmful phenomenon as it affects the environment as well as people. It should be noted that noise reduction in rail transport can be achieved both in railway infrastructure components and in rolling stock. Grubliauskas et al. in [1] notes that transport, including rail, is one of the main sources of noise, with a significant impact on the environment and health of children and adults. Train noise depends on the types of trains, track-type driving, driving speed and driving mode. Noise levels also depend on the rotation of the wheels on the track and on the short track wheel beats connections. The results of measurements have shown that urban rail noise analysed in the residential area is a serious problem which needs addressing by various organisational and technical measures. Analysis in [1] of the results showed that the noise level is dependent on the train type and distance to the railway track. Fallast et al. in [2] consider the use of photovoltaics in the applications of the acoustic baffle (acoustic screens, noise barriers) infrastructure. They refer to photovoltaic road and rail noise barriers in various environmental and soil conditions, including in mining terrains, and stress that noise is an important factor to consider when developing, upgrading and maintaining national road networks in Europe. Shahidan et al. in [3] also observe the noise problem. Nowadays, advanced development and sophisticated new technology have led to various types of environmental pollution such as water, air, land, thermal pollution and so on. Recently, however, noise pollution is becoming one of

the major threats to the world especially in urban areas where it adversely affects the quality of life of the public. In [3] the authors emphasise that the noise is usually emitted by airplanes, trains, vehicles, motorcycles, trucks etc. Even though rail transport requires less energy and emits less hazardous substances, it has contributed to noise pollution issues and several health hazards among urban inhabitants such as deafness, nervous breakdowns, mental disorder, heart troubles, high blood pressure, headaches, dizziness, inefficiency and insomnia. Brzeziński et al. in [4] point out that the formation of noise from railway traffic is a very complex phenomenon; they refer to the use of rail and track dampers. Kampczyk in [5] refers to acoustic baffles along roads and railway lines, paying attention to acoustic protection.

The author of the article has initiated a discussion on selected environmental protection devices in the railway transport infrastructure for environmental protection, focusing mainly on devices designed to combat noise. In addition, attention has been paid to the development of strategic noise maps that are drawn up for the purpose of an overall assessment of noise exposure from different sources in a given area, as well as for the purpose of making general forecasts for that area. Both environmental protection devices and strategic noise maps are directly reflected in civil engineering and transport works. Due to the high inconvenience of increased traffic, acoustic baffles are increasingly being used. Noise is one of the emission elements [6], and emissions are introduced directly or indirectly by human activity into the air, water, soil or land [6] as:

1. Substances
2. Energy, such as heat, noise, vibration or electromagnetic fields

In the field of foundation, assembly and exploitation of acoustic baffles, all kinds of surveying works – which the author indicates – are known to apply. These works in the process of shaping the condition of railway infrastructure are of particular importance in environmental protection devices as a whole in the market economy system.

The paper presents the author's observations and conclusions and was made as a part of statutory research of AGH University of Science and Technology No. 16.16.150.545.

2. ENVIRONMENTAL FACILITIES, INFRASTRUCTURE AND ECONOMIC GROWTH

In order to improve the state of the natural environment, a number of activities are carried out to protect it along with legal regulations. Human activity affects the environment from the very beginning, therefore environmental protection requires correct and purposeful human activity. It becomes necessary to build appropriate technical devices to protect the environment and then create conditions for their current exploitation [7]. As a result of increasing progress in social and economic development, the activity of the natural environment gradually disappears into the so-called self-regulation. The essential technical elements for environmental protection are the following [7]:

- water management to regulate water relations, including melioration facilities
- water supply and sewage disposal
- wastewater treatment and consequently to protect water purity
- protecting the cleanliness of housing estate areas (e.g. waste collection and disposal)
- air protection
- climate (microclimate) shaping purposes, e.g.: city greenery, forest protection strips
- combatting noise
- protection against radioactive radiation

The above-listed groups are very important elements of the economic infrastructure, i.e. durable devices which constitute the basis for functioning in a given area of specific branches of the national economy [7]. The concept of infrastructure is considered in both narrow and broad terms. In the broader sense, infrastructure is understood as a

number of specific branches constituting the basis for the economic development of the country (communication, energy, mining industry) [7]. Such economic infrastructure should be created in every country that wants to develop relatively independently [7]. Railway infrastructure components – provided they form part of a line, siding, other track railway, or are intended for the management, operation, maintenance or transport of persons or goods – include, but are not limited to, the following: tracks and turnouts, turntables and wagon travelling, subgrade, engineering structures, railway control command and signalling building (signal box), platforms, process roads, freight ramps (ramp, loading platform), level crossings and passageways, energy conversion and distribution facilities, and land as parcels of land with railway infrastructure components [8].

The exploitation of railway lines must not cause the environmental quality standards to be exceeded. Emissions consisting of [6]:

- the introduction of gases or dusts into the air
- the introduction of waste water into water or soil
- the generation of waste
- noise causation

which arise as a result of the operation of the railway line shall not cause the environmental quality standards to be exceeded outside the area to which the manager of that facility has legal title. If, in connection with the exploitation of the railway line, a limited use area has been created, the exploitation may not cause the environmental quality standards to be exceeded outside of this area [6].

The obligation to periodically measure levels in the environment or energy is imposed on railway managers in connection with the exploitation of these facilities. The Environmental Protection Law [6] obliges them to ensure that, for example, noise emissions from the operation of the facilities they manage do not exceed the so-called permissible levels. When exploitation facilities with certain characteristics or categories indicate the possibility of introducing substances or energy in significant quantities into the environment, the railway manager is obliged to continuously measure their levels in the environment. If there has been a reconstruction of a railway line which has significantly changed the conditions of exploitation, then the manager is obliged to carry out measurements of levels in the environment of substances or energy introduced in connection with the exploitation of these objects.

Infrastructure facilities for shaping and protecting the environment have features analogous to those of other elements of economic infrastructure, as well as specific features [7]. One of the most important specific features is that their existence causes so-called external benefits to the recipients. They consist in the possibility of conducting business activity without the need to incur expenditure on one's own infrastructure facilities and the possibility of using these facilities at charges lower than those incurred in the case of one's own plant facilities. Some of the equipment intended for environmental protection has a monopolistic character. This means that if there is no practical possibility for individual entities to meet social needs, it is possible to build their own facilities e.g. for river regulation, but it is not always technically possible and economically viable [7].

3. NOISE BARRIERS AND RAIL DAMPERS

Noise barriers are designed to reduce the sound level and are set at a suitable distance from a railway track or road. An acoustic or sound baffle is a natural or artificial obstacle, set on the railway track or road between the noise source and the observation point. Behind the obstacle, a reduced sound level area is created, called the acoustic shade [5]. Supporting structures of acoustic baffles are made of standardised steel profiles, embedded in foundations or driven into the ground. Acoustic baffles are characterised by their insulation and good sound absorption, they should meet the strength requirements, and the location of the noise barriers and their height above the track is very significant because the area of the acoustic shadow depends on it. This area protects people or the environment from the negative effects of communication noise. The area of the shadow is determined by the same methods as the area of the shadow

in optics, but this area is significantly limited for long sound waves due to their diffraction. An acoustic shadow is an area that is not affected by sound.

In order to choose the right height, the expected reduction of the sound level is analytically determined when designing the noise barriers. In order to determine more precisely the acoustic field behind the noise barriers, the thickness, cross-sectional shape and noise barriers' length should be taken into account. Acoustic baffles are selected in relation to climatic conditions, then the terrain and the nature of the buildings (Fig. 1). The height of the noise barriers located on the side of the track – in order to be visible to train passengers – should not be more than 2 m above rail the head level (crown of the rail) (Fig. 1). In intertrack spaces, the height of the noise barriers should not exceed 1 m. It is also beneficial to locate noise barriers directly between tracks, then the noise is suppressed and there is less distance between the noise barrier and the track axis. However, this also has disadvantages because it makes maintenance work more difficult. Hajduk in [9] notes that in the case of low noise barriers, in addition to the lower cost effect there is an unspecified gain in terms of preserved landscape. There are three groups of noise barriers:

1. Vertical
2. Oblique
3. Horizontal

(a) (b)

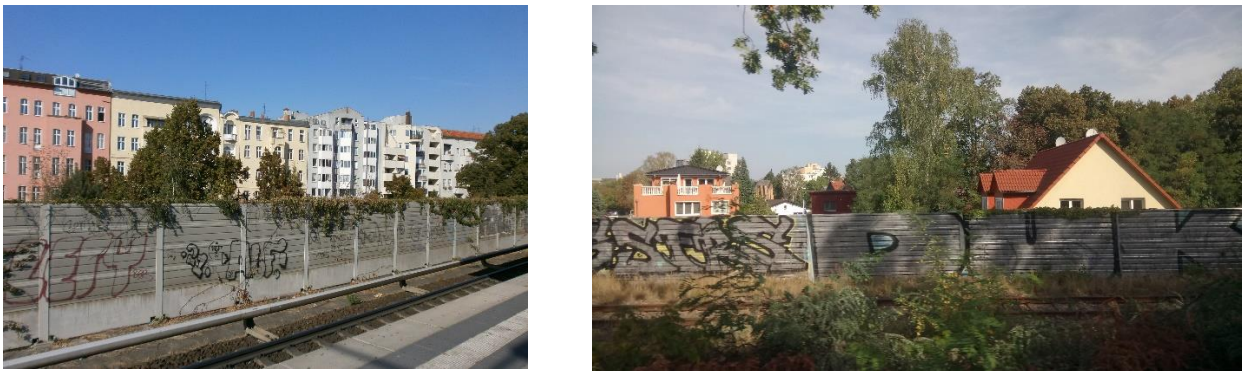


Fig. 1. Noise barriers of railway infrastructure (own photograph): (a) Berlin-Charlottenburg Station, (b) Berlin Tegel

The main types of noise barriers are: absorptive, double, with specially shaped upper edges, profiled at the length, scattering and angled. The noise barriers owe their usefulness to two basic physical parameters: sound insulation and sound absorption coefficient. The first one is responsible for the amount of sound energy that will be reflected by the noise barrier itself into the zone it protects, and the second one is responsible for the amount of sound wave energy that will be reflected back to the sound source. In order for the effectiveness of acoustic baffles to be high, both parameters should be as high as possible, i.e. the amount of energy of the acoustic wave that is reflected and penetrated through the noise barriers layer should be as low as possible. The screening efficiency is defined by a size, called the acoustic efficiency of the noise barriers. It is the difference in noise level at the observation point tested before and after the noise barrier is built.

In the field of foundation, assembly and exploitation of acoustic baffles all kinds of surveying works are applied. Sękowski and Musiał in their work refer to the issue of acoustic baffles' foundation [10]. The authors note that the supporting structures of acoustic baffles should be properly seated, at the same time ensuring the requirements of geotechnical standards of boundary conditions. They should also meet the structural, economic and aesthetic conditions. Most often acoustic baffles are placed indirectly on foundation piles. The methods used for surveying acoustic baffles include:

- "3D polar" in measurement of the deviation of the acoustic baffle wall from the vertical plane
- "Constant straight" in measurements of deviations from the straightness of the acoustic baffle wall
- "Observing horizontal directions" ("small angle method") in measurements of deviations from the verticality of the profile edge
- "Direct projection" in measurements of deviations from profile edge verticality
- "Surveying altitude measurement" in acoustic baffles elements

Rail dampers (also called track panels) are placed on top of sleepers. As the name suggests, the purpose of these silencers is to suppress noise (Fig. 2) as they partially absorb and disperse the sound wave. In this type of solution, prefabricated elements are used to fill the space between the rails. The installed rail dampers of compact construction form a sound-absorbing "wall". Pultznerová and Ižvolt in [11] correctly note that it is important to monitor and analyse noise emission levels according to the different types of railway track construction, not only through their structural modifications and auxiliary equipment, but also through the construction and shape of rolling stock and trainsets. Rail dampers have the advantage that their installation does not require insertion into the railway ballast, and thus make an appropriate noise reduction.

(a) (b)

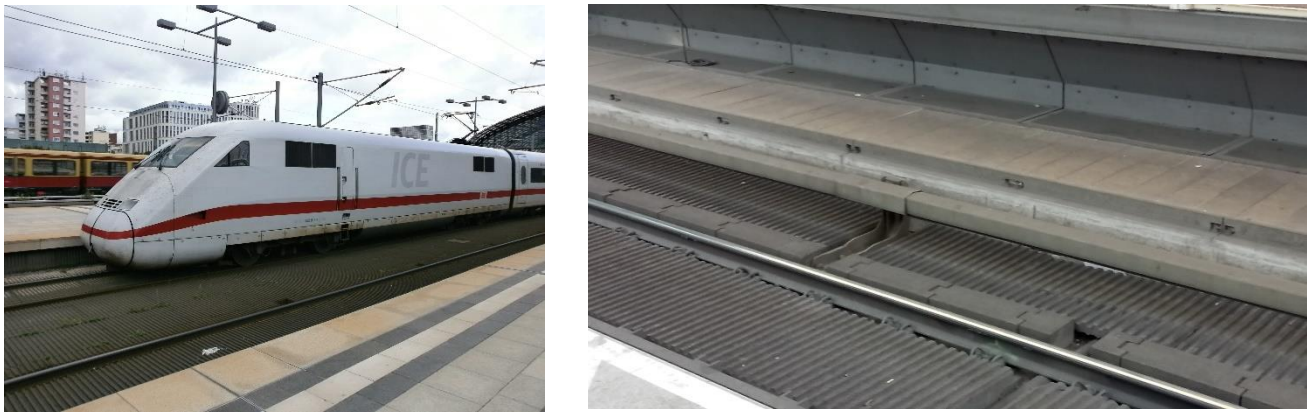


Fig. 2. Rail dampers - Berlin Central Station (de. Berlin Hauptbahnhof) (own photograph):
(a) in and between the railway tracks; (b) view of construction details

4. STRATEGIC NOISE MAPS

The process of drawing up and reporting strategic noise maps and environmental protection programmes against noise has been defined in the Environmental Protection Law [6]. A strategic noise map is a map drawn up for the purpose of an overall assessment of noise exposure from different sources in a given area, or for the purpose of making general forecasts for a given area. Strategic noise maps are the primary source of data used for [6]:

1. Informing the public about the environmental risks of noise
2. Data elaboration for state environmental monitoring
3. Creating and updating environmental noise protection programmes

4. Strategic Planning

5. Planning and land use

Strategic noise maps are made for [6]:

1. Major rail lines – with more than 30,000 trains passing throughout the year

2. Cities with more than 100,000 inhabitants

3. Major roads – with more than 3 million vehicles passing through the country annually

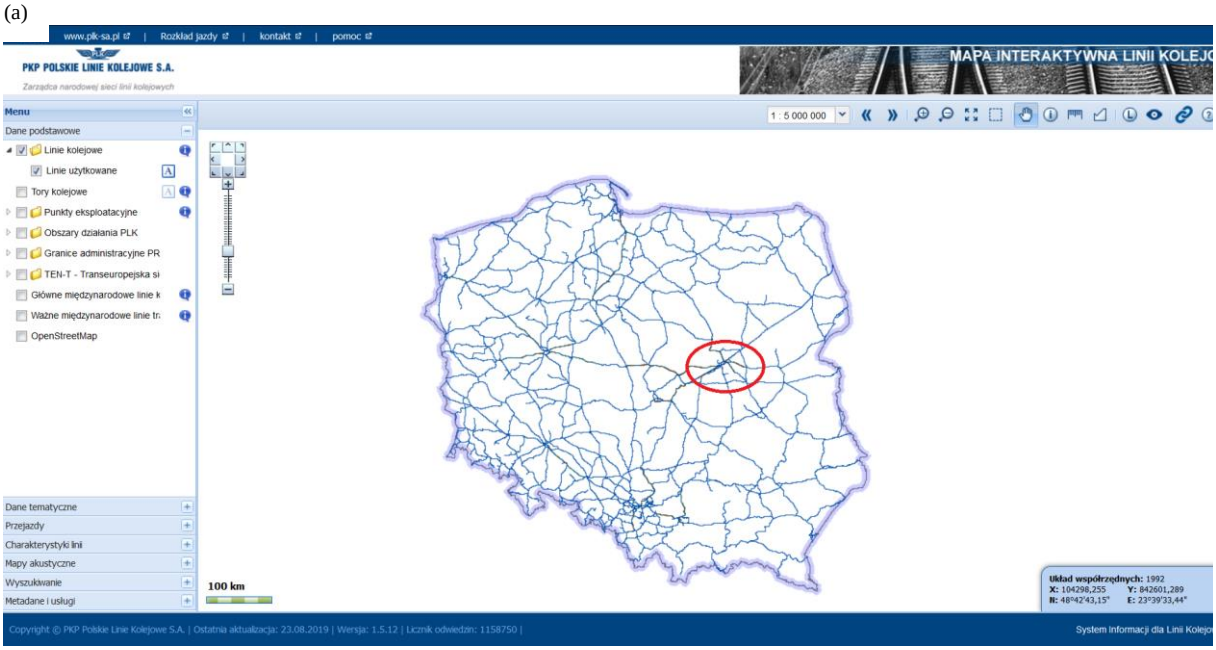
4. Main airports – civil airports with more than 50,000 annual operations

Figure 3 shows a noise map generated by the exploitation of railway lines, presenting the noise levels in a given area in the form of graphic representation of long-term, average sound levels expressed in decibels (dB). The map takes into account the indicators applicable to long-term environmental noise protection research, broken down by type:

- **LDWN** – long-term average A-weighted sound level in [dB], determined over all days of the year, taking into account the time of day (understood as the interval from 6.00 a.m. to 6.00 p.m.), the time of evening (understood as the interval from 6.00 p.m. to 10.00 p.m.) and the time of night (understood as the interval from 10.00 p.m. to 6.00 a.m.)

- **LN** – Long-term A-weighted average sound level in [dB], determined at all night periods of the year (understood as the time interval from 10 p.m. to 6 a.m.).

(a)



(b)

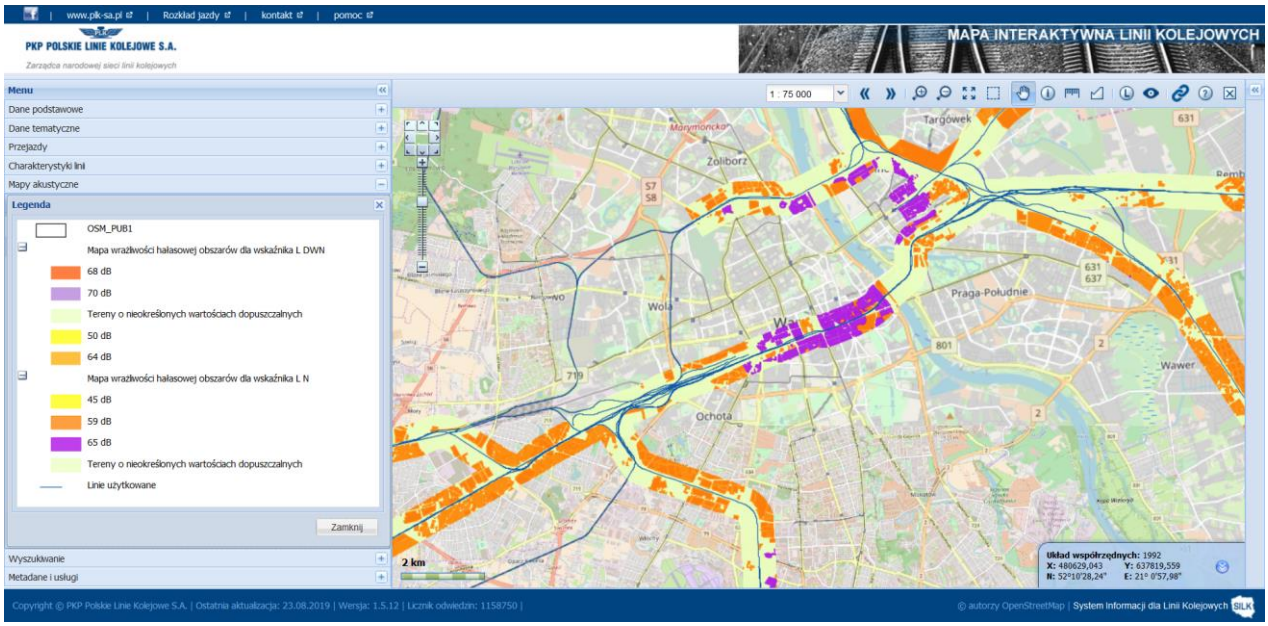


Fig. 3. Map of noise sensitivity of railway areas in Poland with LDWN and LN indicators developed in the Interactive Railway Line Map portal „Polskich Kolei Państwowych Polskie Linie Kolejowe S.A.”. Available online: http://mapa.plk-sa.pl/ (accessed on 28 April 2020): (a) location of the analysis area in Poland, (b) view of the analysis area detail

Noise assessment methods for strategic noise mapping are set out in the Annex to the Directive [12]. The railway managers identify the main railway lines and provide the following data to the Chief Inspector of Environmental Protection within the scope of their competence:

1. National railway line number
2. Unique railway section code, compliant with reporting requirements to the European Commission
3. Annual number of train journeys
4. Length of the railway line section
5. Coordinates of the beginning and end points of the railway line section together with the name of the coordinate system according to the Geodetic and Cartographic Law [13]
6. Graphical representation of the course of a railway line section together with the name of the coordinate system according to the Geodetic and Cartographic Law [13]

Rail transport, which is strongly accepted from an economic and environmental point of view, is still subject to the requirement to guarantee noise emission limits also for its tracks that do not exceed the permissible noise levels [11]. Paožalytė et al. in [14] refer to the composition of strategic maps, considering issues of modelling the spread of noise generated by rail transport during the day and night using computer applications.

The results of noise mapping are presented using interactive and free map services, an example of which is the Interactive Railway Line Map „Polskich Kolei Państwowych Polskie Linie Kolejowe S.A.”. In Germany, the Federal Railway Office (in German: Eisenbahn-Bundesamt) is responsible for making noise maps for federal railways. Such maps also allow one to display noise and traffic statistics.

5. CONCLUSIONS

Environmental protection equipment in railway transport infrastructure is constantly being extended by means of various structural elements, including their maintenance. However, for the railway infrastructure to ensure safe, regular and continuous movement of rolling stock, it must also be equipped with active environmental protection devices. Hajduk in [9] correctly states that the modernisations and revitalisations of railway lines are bringing measurable benefits in reducing rail noise emissions, but the idea of a modern railway should refer not only to the track infrastructure, to modern control and information systems, but also to investments around the railway, including environmental protection. Sękowski and Musiał in [10] note that noise barriers are exposed to horizontal forces, including wind pressure, air pressure from moving vehicles and snow impact from maintenance vehicles It is these, including their own weight, that determine the construction solutions of the noise barriers, in particular their foundation. As far as implementation and exploitation works are concerned, surveying works are an indispensable element of their monitoring. The role and place of surveying in the process of environmental protection equipment for railway transport infrastructure training is of great importance because new methods and techniques of engineering measurements used in surveying and transport construction constitute an indispensable scope of knowledge for making decisions about their condition; in particular, with a special emphasis on different environmental and soil conditions, including mining terrains, in relation to the topics addressed in the paper [2]. The advantage of the development of rail transport infrastructure is that its standard is increased along with the safety of passenger and freight transport, and these require the use of environmental protection equipment. Well-developed railway infrastructure contributes to the proper development of economic and social life. The results of the research fit into the subject of contemporary civil engineering works and rail transport, especially developing contemporary research in the diagnostics of transport construction and in the surveying of rail transport.

Acknowledgements

This paper was made as a part of statutory research of AGH University of Science and Technology No.16.16.150.545.

Funding

This research received no external funding.

Conflict of Interest

The author declares no conflict of interest. The author has read and agreed to the published version of the manuscript.

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ISBN 978-80-88203-16-2

Czech Institute of Academic Education z.s.