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Effects of ICT integration in schools on the role of teachers

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Abstract

Technological changes are influencing our approach towards life and work on a daily basis. These changes are reflected also on the process of gaining knowledge. Schools have realised this need and have started with the usage of ICT and Internet during everyday learning processes. This research has identified the need and benefits from the use of ICT in education, and how this is influencing the teachers' motivation for work and professional development. Experiences from implementing ICTs in educational processes from different parts of the world are showing that only with the introduction of ICTs, it is not possible to instantly improve the educational process and its results. Effective application of technological tools in education requires a more complex approach. There has been a big number of computers installed in Macedonian schools. The number of primary and secondary teachers trained is large, either directly by experts or with dissemination in own schools. The work on this paper combined the desk research on existing literature and similar issues on international level with a survey of 182 Macedonian teachers from urban schools. Analysis of received answers is revealing that ICTs and electronic materials are not solely solution, and hardware will not automatically improve the quality of education. More time should be dedicated to increasing the teachers' capacities for effective preparation of digital learning materials and support of contemporary learning.

Keywords: ICT in education, Teachers' role, Teachers' motivation, Professional development of teachers with the use of ICTs.

1. Introduction

Globalisation and technological change are processes that are only accelerating in the last 20 years. They affect all aspects of our lives, especially the economy. Today's economy is technologically supported, with a huge amount of new information and knowledge every day. The emergence of such a new economy has a huge impact on the nature and purpose of educational institutions. Schools can no longer remain just places where a certain knowledge, a certain set of information will be transferred from teacher to student in a certain period of time. The concept of learning needs to change. Learning is not just a simple acquisition of knowledge, but more and more it is learning how to learn, for example acquiring habits and knowledge how to constantly learn and improve throughout life. A literate citizen of the 21st century is one who knows how to find information needed, knows how to learn and constantly improve herself /himself. Despite all these changes in different aspects of life, schools have not changed significantly. Teachers are trying to cope with the situation but they need substantial impetus.

2. Motivation of teachers for work

Motivation is a very complex internal driver of every person. Motivation is different for each person. It depends on the period of her/his life, but also on the social conditions. Teachers are primarily motivated by intrinsic motives such as self-esteem, responsibility and a sense of accomplishment. Thus, participation in management, further training, and systematic, supportive assessment can motivate teachers to excel. Formal, non-formal and informal training promotes the sharing of ideas and mutual cooperation between teachers. Formal education can include a resource for teachers to share or discuss professional problems, create communities to share experiences and help each other; non-formal education can be realised through workshops and seminars. Various types of training improve teaching techniques and increase professional self-awareness. The introduction

of ICTs in teaching is often a novelty for teachers and they need training to be able to apply computers and communication technologies in the classroom. "A critical factor influencing the adoption of new technologies by teachers is the quantity and quality of technology inclusion in their university preparation." (Tondeur, 2012) As early as in 2001, the European Centre for the Development of Vocational Education conducted a survey in several European countries that examined how teachers react when introducing ICT in teaching. The conclusion is that teachers are insufficiently prepared to apply ICT in pedagogy and classroom management resulting in divergence in classroom approaches.

How to increase teachers' motivation to work using ICTs? Maybe by increasing teachers' salaries? The first thing that comes to mind is the question "What can be a motivating factor?" Is it the salary / money or some other reward? But various studies find this factor to be the least important of all. "Status is actually something that is based on the perceptions of others." (Bush, 2005) The status of teachers in the respective society is one factor that greatly influences the choice of the teaching profession. "The teaching profession can be included in professions that are quite well known to the public and in many ways easily recognisable." (Poposki, 1998) The status of the teacher in society varies in different countries. For example, if teachers are valued in a society, then it is clear that more advanced professionals will choose the teaching profession as their profession. Or, if the teachers in a society are more women, then men in that society would rarely choose the profession of teacher for themselves. If teachers are on the margins of a society, it is really unmotivating for them. Teacher status influences people to choose teaching as a profession and to stay in that field. The status of teachers in Macedonia is not very high, but also cannot be neglected. Teachers are among the professions that are still valued in today's very complex Macedonian society. Although teachers complain a lot and many of them demand salary increases, still many young professionals try to enter the teaching profession because teachers are still viewed with respect in society.

Managers and leaders in each institution should also be aware of the career life cycle of employees. The careers change from starting, stabilising, new challenges, stagnation to retirement. Every school has teachers at different stages of their careers. These stages should be taken into account when trying to motivate the individuals. One thing motivates newcomers in their start-up period, completely different are the motivating factors for teachers who are in stagnation. This means that even in the same school in the same society, managers and leaders need to find different ways to motivate people, keeping in mind the stage in the career circle for each individual. For example, if there are many projects happening in a school, and if new teachers work on them, they will be very motivated to prove themselves. Older teachers, on the other hand, should be given other tasks where their experience can help them to complete the tasks. Usually they are the heads of some departments, or are mentors of new colleagues, etc.

Motivation as an individual driver is different for each person. But at the same time, it has some things in common. "The sooner the benefits of an activity are seen, the greater its impact." (Bush, 2005) This means that the goals set in the school should be more specific and achievable. Goals should be able to be achieved in a certain time, something that can be achieved in the near future and thus motivate people and themselves to be focused on achieving those same goals. Achievable goals can be a good motivating factor that can be used when planning short-term school activities.

The general feeling of success in the school / organisation can be another motivating factor. "Nothing succeeds like success." (Evans, 1998) It is very motivating to work in an environment that is successful, satisfied and motivated to contribute more. Various reforms and changes have been made and are being made constantly in every education system and in every school. Some are successful and schools continue to operate in the new way, but some reforms are unsuccessful and are not accepted. The introduction and application of ICTs is a revolutionary change in education, as nothing similar has happened in schools in the past. Therefore, the application of ICTs and the introduction of innovations can also be a motivating factor for some teachers and some schools as a whole. The schools that were among the first to introduce computers in teaching are seen by their environment as leading schools and many teachers want to work in such schools because those schools move, thrive and in them there is an opportunity for teachers to thrive.

A very important motivating factor can be the system for evaluating the work of teachers, if it is well designed. It can provide the necessary feedback so that teachers can assess their professional advancement and be motivated (either internally or externally) to move on. A poorly designed teacher evaluation system can cause anxiety, mistrust and anger. Principals should encourage teachers to participate in the planning and implementation of a practical evaluation system based on research, created for the needs of the specific area. The main purpose of assessment should be to provide information that will help teachers to improve their teaching performance. According to this, a good evaluation system should reflect respect for the value of the individual and dignity, by encouraging teachers to set personal and organisational goals. The evaluation system should also stimulate imagination and creativity, recognise well-done work, and include self-assessment and evaluation of others, and thus motivate teachers to excel.

3. Motivation of teachers for professional development for use of ICTs

In recent years, the approach of lifelong learning as a concept in any sphere of business has become more and more relevant. Professional development of employees appears as one of the opportunities to achieve greater productivity or higher quality products in an organisation. In the context of education, it is about the quality of the final product - the students, in form of their acquired knowledge, skills, attitudes, abilities, experiences and satisfaction from the process of that acquisition. Teachers as instructors of students and guides of the learning process, should be highly trained to be able to meet the expectations of students set before them. Therefore, teachers will have to constantly improve, especially in today's conditions of rapid and daily change in all spheres of live and work.

The introduction of ICTs in the teaching process opens a number of opportunities that were not previously available in any other way. Teachers should be prepared for this so that they can adequately respond to changes in the school environment, but also to the demands of their students. Many of the Macedonian teachers from primary and secondary education have attended at least one training on the use of computers and new technologies in general and are familiar with the basic application of computers. But basic computer literacy is no longer enough. Continuous improvement and additional training are needed to take advantage of the opportunities that open up with the help of new technologies, because every day the market is enriched with new software or smart device, that is providing new ways and opportunities to use technologies. Information and communication technologies, their use and monitoring of innovations can be a goal for themselves in the professional development of teachers, but also to be applied as a tool in the professional development of teachers to achieve availability of all existing resources at the time of training. In this way, teachers will apply ICTs as a tool for self-improvement. Also, an important part of the professional development of teachers should be how ICTs can be applied as a tool in the teaching process that facilitates and improves the process of acquiring knowledge and achieving the set educational goals.

There are many opportunities, trainings, projects, exchanges of experiences on a global and local level, which offer professional development of teachers. They open up opportunities for proper and comprehensive management of teachers' professional development. If most of these opportunities are used for professional development of teachers in accordance with the goals and needs of the school, then we can expect to increase the motivation of teachers to work, and thus the quality of work of teachers. In each school the need for professional development is determined by the school development plans. There is no single solution or proposed idea at the national level that will be unique and will apply to all schools. Somewhere teachers at the school level organise and attend trainings for professional development, somewhere it depends on the principal who gives and encourages initiatives, and somewhere it is left entirely to the innovation, resources and creativity of the individual teacher, so everyone decides on a way of improvement at its own discretion. In some cases, teachers are trained informally through trainings, seminars and workshops as part of various projects, knowledge transfer or local initiatives. The most common case is the informal transfer of knowledge and experiences, when teachers in their environment, group or community through conversation and unstructured exchange the acquired knowledge or discuss possible improvements.

In any case, in order to determine the type of professional development that is most appropriate, a detailed analysis of the professional development needs of teachers is needed at the beginning. Teachers themselves should be involved in this analysis as actively as possible, having in mind their own capacities and the capacities of the organisation where they belong, information on education trends - internationally and locally, strategic movements and changes in education, education market and labour. It will greatly help to prepare a plan for professional development of teachers with precisely defined goals, target groups, necessary resources, dynamics, expected results and a system for monitoring and evaluation of all stages of that process. In case teachers are involved from the very beginning in the diagnosis and analysis of the current situation by defining the needs and goals, they will feel more ownership of the defined ideas and needs and will be much more motivated and interested in their own professional development.

4. Research description

This paper is based on the findings from the research addressing some of the aspects of the work of teachers, the impact of the application of ICTs on the development of quality education in the area of teacher motivation for work and successful learning by students. A random sample of 182 teachers was used scoping teachers working in schools located in urban areas. This research was conducted with a survey that had 11 closed-ended questions and 6 open-ended questions. The survey was not burdened with too many questions so as not to take a long time to complete. The additional information that was obtained from the answers to the open-ended questions was processed qualitatively in order to gain more information. At the beginning of the research, the survey was created

and posted online. Few teachers have answered the online questionnaire. This is also giving information that is interesting to follow up. The succeeding sections are presenting qualitative findings from answers on the open-ended questions.

5. Experiences from using electronic materials for personal professional development

One of the questions aimed to gather information on how much and how teachers use ICT content for their personal professional development. In Macedonia, in recent years, a numerous teacher training activities have been realised. From all those training, one thing should be indisputably clear, and that is that everyone should continue with personal lifelong upgrade. This question seeks to explain whether and to what extent teachers understand this and how they react to this topic.

More than half of the teachers decided to answer this question. Most often their answer is that they have a positive experience, that the professional work in the classroom can be greatly improved. Some teachers point out that they have used online training courses. Many write that they use social networks to communicate with other colleagues, whether from Macedonia or internationally. *All of these answers show that teachers are aware of the need for personal professional development. Depending on the individual, everyone has a different approach, but still most of them try to keep up with new developments in the professional field. This is very positive and gives hope for increasing the personal capacities of teachers as professionals.*

One identified challenge is that there are no materials for self-improvement in Macedonian language. So only those teachers with a solid knowledge of a widely used foreign language have the opportunity to use online materials for personal development. This is an obstacle that many teachers probably have, who, although probably aware of the need for improvement, do not have the opportunity to practice it. Another obstacle is the price of some of the content. Although there is an opportunity to find a large variety of free content, when it comes to a narrower professional topic, it should be paid and hence, it is difficult to access for Macedonian teacher.

Teachers see the work in various international projects as an opportunity for improvement and their own professional development. *It is good to enable greater involvement of Macedonian teachers in various international projects.*

A small number of teachers list specific websites that they are using. When searching through those web pages, it is obvious that these are pages with a lot of content that can facilitate the work of the teacher and at the same time help increase teacher's capacity. Efforts should be continued to provide Macedonian teachers with access to the latest information online.

6. Experiences from applying electronic teaching materials

The electronic teaching materials are not always fully and correctly understood. One of the questions sought to gather information on how teachers understand the electronic teaching materials. This question could have been left unanswered if teachers had no experience. However, a significant part of the teachers answered it, but their answers show that they still do not have the same understanding. In some of the answers the e-diary reappeared, which means that the issue of working with the e-diary is important for teachers, but it also means that they are not aware of the characteristics and specifics of the e-diary in relation to the electronic teaching materials.

Some teachers say that they create teaching materials themselves. Some exchange them with their colleagues. In this case, it may really be about electronic teaching material, but this indicates that it is about internal teaching material. Some teachers wrote that they take existing materials from the Internet and process them. In this case it may be electronic content. However, this could be examined in more detail and in more depth and to what extent teachers really use electronic teaching materials. In any case, *Macedonian teachers still need to be upgraded with topics in the field of databases of electronic teaching materials, their creation, use and updating.*

Some teachers complained about the small number of computers available in the classroom and the poor Internet connection. This further complicates any application of ICTs in classrooms and could only be overcome with *adequate technical support and updating of existing software and hardware.*

English language teachers state that they use ready-made databases with exercises and activities for students. These teachers obviously have a rich experience with the application of electronic teaching content databases because the program and the textbook require it. There are sites such as British Counsel, Oxford University Press, Cambridge, Macmillan, BBC, which can serve as examples of electronic teaching materials and content databases.

7. Experiences in introducing new approaches by applying technology in teaching

From the international experiences that can be found in the literature, it is clear that the introduction of ICTs in teaching should be accompanied by a change in approaches to learning and teaching. Whether and how it is understood by the Macedonian teachers is examined by one of the questions.

Most often the experiences of those teachers who have started to apply ICTs in teaching is very positive. In a few cases it is only stated that the equipment is outdated in the schools and may fail. Also, some of the teachers emphasise that *it is necessary to make appropriate software applications in Macedonian language that will be in accordance with the curricula so that it can be applied during teaching and learning.*

On the other hand, there are teachers whose experience is that students become more active, more engaged in learning, new approaches to work are more interesting to them, they acquire research skills and habits, and the teaching itself is filled with interactivity. Mastering the material is easier for students when using ICTs. And it is easier for the teacher to monitor the students' progress, to process the data automatically and to get feedback faster. Interactive whiteboards, but also presentations and the Internet are popular with teachers according to the answers of the majority.

Weaknesses in introducing new approaches identified by teachers are weaker communication between students and between students and the teacher, and especially verbal communication is very poorly represented.

Teachers also emphasise that the introduction of new approaches to teaching requires greater commitment on the part of the teacher, especially at the beginning, constant research, learning and upgrading by the teacher. When *introducing new approaches to education, it is necessary to have appropriate training for teachers to get acquainted with the innovations and emerging opportunities. Also, teachers should be motivated to continue with individual continuous upgrading and improvement*.

The introduction of change is not an activity that is once realised and completed. *The introduction of change should be introduced as a practice in Macedonian education and we should constantly strive to find new ways and opportunities for the application of ICTs and new technologies that will improve the quality of education in Macedonia.*

8. Conclusion

The introduction of technology can enrich learning, encourage project-based and problem-based learning, provide simulations of specific practical activities, collaborative learning, real-time assessment. All this can be done through various new tools such as interactive courses, virtual labs, discussion forums, simulations and experiments, and even various games. It is vital that teachers become agents of change, not only through the application of technological innovation, but also through their creation and design. (OECD, 2015)

In general, most of the surveyed teachers in Macedonia have a positive attitude towards the use of teaching materials by ICTs and think that their application will increase the effectiveness of teaching work. The finding shows that teachers need increased capacity for effective application of electronic learning content. Domestic resources in Macedonian language adapted to the curricula will greatly contribute to the greater use and utilisation of the existing ICT in order to increase the quality of learning and acquired knowledge. Technical support also needs to be improved so that the prepared materials can be applied effectively. All this is identified by the review of international practices and is supported by findings from this research.

At the very beginning of this research, an unexpected fact was obtained - a small number of teachers responded to the online survey, and a significant number were willing to fill out a paper copy of it. The fact is that only 1/3 of all respondents answered the questions with the online survey. Future research should determine the reasons why teachers are more willing to respond to a paper version of the survey rather than an online survey despite existing technology in schools.

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How does your school administrator's pattern affect the organizational sense of teachers at their school?

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Abstract

The professional literature perks often written about the relationship between the manager's management style and the corporate belonging to the employees in general. Professional literature report on how corporate culture can positively influence the mental and mental health of workers and managers of the organization both (in the US and US, 2010). The positive organizational climate can lead to a self-evaluation of the employees, along with an increase in motivation for work and commitment to the organization from everyone involved in the organization. In addition, the healthy organizational climate contributes positively and significant to the disdesirable organizational behavior of employees such as absences, resentment, and more. A growing research knowledge organization shows that a positive climate is critical to the effective prevention of corporate dangers. In general, there are very specific and theoretical literature that discuss climate matters around the world that report on positive climate, there is a strong impact on drive propulsion and other organizational behaviors. In addition, studies show that the quality of the climate contributes to better deliverables, performance and the personal development and welfare of the workers (angel Pines, 2011).
The Elysburg questionnaire was used for corporate analysis and the findings were analyzed by means of open systems theory.
The findings of diagnostics indicate that the objectives and structure and leadership are mimic, while the other pieces of the boxes are functioning optimally, although some ingredients in those boxes are not functioning properly. In general, it is possible to point out unclear enterprise goals to the team, an inflexible, untransparent organizational structure, and a strong leadership. The diagnosis also arises from the educational team and the school management are not particularly healthy, but the relations between themselves and themselves are positive and support each other in the terms of their personal knowledge and experience.
Generally, the school is responsible for reexamining its decision-making process and policy, making it clear to the goals and objectives of the school for all educational teams, and mobilizing a coalition for leading the school toward achieving these goals. The school must also have a transparent, professional policy of sharing school roles and resources. The school administration should educated and obtain policy of empowerment and face in to collaboration and development from motivation and organizational belonging and welfare to teachers in order to reach this coalition

Introduction

The diagnosis was done at a school in the area of the northern triangle of Israel. Based on my information in my hands and in my talks with teachers, a lot of teachers are looking for an initiated transfer annually. In addition, there are the absences and the frequent delays of the school teachers. These elements indicate a corporate issue that can be attributed to the lack of organizational belonging.
There are (-) classes, (-) teachers and teachers, a library, a computer room, a football field, a laboratory and a pedagogical center in the diagnostic school. The school professional team includes the school principal, Deputy Director, educational advisor, semi-time psychologist, half-time nurse, two servers, a computer man in communities, and a regular guard.
This diagnostic was carried out by Alon Weizsburg. 15 questionnaires were divided into school teachers and teachers, and then analyzed by finding averages of each box examined. Analysis of the boxes was performed according to the Weissburg outline, and is the simple analysis. During this analysis, we estimate the variance for each of the seven boxes with regard to 4 that represents the neutral situation. A score greater than 4 will indicate a problem with organizational function. The closer the score to 7, the higher the severity of the problem is. Averages below 4 indicate a lack of problems, and code 1 indicates optimal function.

The main purpose of this diagnosis is to examine the school belonging to teachers through the lens in the management style. Whether the management style does affect a sense of school and solidarity with its goals and objectives. Added, questionnaire and Johannesburg will be used to map the functionality of the organization.

Method

I was asked about the Waissburg Enterprise Diagnostics for 15 teachers and teachers from the school. I asked teachers to come to my bothered and you got your investment to participate in the diagnosis, I broken the questionnaires to teachers and asked them to come in my cell after the questionnaire's fill was over. Two days later, all the questionnaires arrived and I passed them to Excel tables so that they could find averages, which they analyze and evaluate each box separately.

The questionnaire's surgery is based on Alon Weissburg
The objectives box

Average	*Purpose*															
4.1	4	4	3	4	6	4	4	3	5	5	5	4	4	4	3	*The aims of our organizations are defined and clear*
4.8	5	7	5	7	6	4	4	4	4	4	4	5	5	5	4	*The staff and me identify with the tasks that we have placed on us*
5.6	7	7	5	5	6	6	7	6	6	5	5	5	6	5	4	*I understand and know the goals of the organization*
5.1	4	5	6	5	7	6	6	6	5	5	5	4	4	4	5	*I understand the priorities of the organization*
4.9	4	6	5	4	5	5	5	5	5	6	5	6	5	4	4	*I strive to establish team goals with less intervention than funds*
4.95																*Box average*

Looking at the findings relating to the goal box clearly shows that there is a poor function in this box. All the statements in this box have been given the average above the neutral average (4). In addition, the overall average of the box is higher than the neutral situation which points to a defect in this box function. The conclusion that comes from the table: The goals of the organization are not clear enough to teachers, the team does not identify with school goals, the team does not understand the school's objectives and priorities, and the team works indially when determining non-management goals. **So work to improve this box**.

Average	*Structure*															
4.6	4	5	5	4	4	4	5	5	5	5	5	6	5	4	4	*In our enterprise, we have a flexible work division*
4.4	6	5	5	4	4	4	4	4	5	5	5	4	4	4	4	*The role definition in our organization is aimed at achieving the goals*
4.6	5	5	5	5	5	6	4	5	6	4	5	4	4	4	3	*The definition of roles in a clear, log__LW_AT__-log__LW_AT__-simple organization*
1.4	1	1	2	2	1	1	1	2	2	1	1	1	1	2	2	*My work unit is well organized and efficient*
4.33	4	4	5	5	4	4	5	5	5	5	4	4	4	4	3	*Dividing work in your organization helps achieve goals*
3.91																*General average of the box*

Structure box

A reference to the structure box elements table points to a mixed trend. In general, the behavior of this box, as is the analysis shows, is of some degree that the overall average of the box is very close to the neutral value and is 3.91. On the other hand, in depth reference in this box points to a mixed trend. Only one element of this box is optimally functioning and is putting the unit together in a good and efficient manner. The other four elements function improperly and are higher than the optimal value. **Conclusion:** The school doesn't have a flexible work division, the job definition isn't aimed at achieving the goals of the school, the job definition isn't fair, and the work division isn't organized in a way that helps to achieve the aims. **So work to improve this box**.

The leader box

Average																*Leadership*
5.07	6	5	4	5	4	5	5	4	6	6	6	5	5	5	5	My immediate supervisor wins the efforts
4.87	5	4	5	5	5	6	4	4	6	5	5	5	5	5	4	With the patterns of leadership in our organizations, the organization is developing
5.20	4	5	5	4	6	5	6	5	5	5	5	6	6	6	5	Management actions contribute to help achieve corporate goals
4.73	5	5	6	5	6	4	4	4	5	5	5	5	4	4	4	I get clear instructions from the Commissioner
5.27	5	6	6	6	6	5	5	5	5	4	5	6	5	5	5	When my supervisor tries to affect the team, It works correctly
5.03																*Average*

Looking at the Show box table indicates that the leader box shows a sweeping behavior. The overall average of this box is higher than the optimal value and it stood at 5.03. Also the elements of this box function improperly, and their average is higher than the optimal value. **Conclusion:** Teachers are not being backed up by management, administrator leadership patterns cannot allow organization evolution, management does not contribute or help in achieving this goal, unclear guidelines alongside inaction when the manager tries to affect the team. **So work to improve this box**.

The relationship box

Average																Relationships
4.73	6	6	6	5	4	4	4	4	4	4	5	5	5	5	4	Relations with my supervisor are good
2.40	1	2	2	3	2	4	3	1	3	2	2	3	3	3	2	When I have a problem with my work, I always have who to discuss it at work
1.53	3	2	1	2	1	1	1	1	2	1	2	2	1	1	2	My relationship with the workers is good and positive on both the social and professional terms
1.87	2	3	2	2	1	2	2	2	1	1	1	2	2	2	3	I do well for my work because of the positive relations created in the organization
4.67	5	4	4	4	4	5	5	5	5	5	6	5	5	4	4	There are no cases in which conflicts that do not come about resolution
3.04																*General average of the box*

The analysis of the relationship box shows optimal functioning in general, and the average of the box is 3.04, which is less than the optimal value of 4. There is a deeper understanding of the elements of the box showing poor

functionality in two components, and an optimal function in three components of the relationship box. Poor functionality is in the relationship between teachers and management, and the existence of unresolved conflicts in school. An optimal function is a map to others in the referral component when the team encounters a problem, good relations about the rest of the team, and make proper the work of the teacher with the good relations with the rest of the team. **Conclusion**: We need to act in the direction of improving the relations between the team and the management, and to solve all the conflicts in school so this box will function optimally. **So work to improve this box**.

Rewards box

Average																*Benefits*
2.07	1	1	1	2	4	3	3	2	2	2	1	3	2	2	2	*I feel that my job helps my personal brainness*
2.07	1	2	2	2	1	2	3	2	2	2	2	3	2	2	3	*Each person in the organization receives wages and fair benefits*
4.40	6	5	5	4	5	5	6	4	4	4	3	3	4	4	4	*There are opportunities for our organization to promote*
1.73	2	2	3	3	2	2	1	1	1	2	2	1	1	1	2	*I get a salary that matches my work performance*
5.33	5	5	6	6	6	5	5	5	6	5	5	5	5	6	5	*The tasks to be done in an organization are accompanied by incentives*
3.12																*General average of the box*

An analysis of the remuneration box shows optimal functioning in general, and the average value of the box is 3.12 that is higher than the optimal value 4. On the other hand, an in-depth look at the box is three elements, their average is less than 4, and is poor in two components, their average above 4. **Conclusion**: The school teachers are experiencing that work helps in personal development, wages and fair benefits, there are no options for moving forward and tasks within the organization are not accompanied by incentives from management. **So work to improve this box**.

Support services box

Average																*Support mechanisms*
2.27	3	1	3	2	2	2	1	1	3	3	3	2	2	3	3	*The staff is helping the direct commissioner's intentions*
1.93	2	1	4	1	2	1	2	3	2	1	1	2	2	2	3	*To properly do roles have all the information that is needed for this*
2.07	1	2	2	2	3	2	1	2	2	3	3	2	1	3	2	*They have effective coordination mechanisms*
2.53	3	3	2	2	2	3	3	3	2	2	2	3	3	3	2	*When I need help, my single units help the organization*
4.80	4	5	6	5	4	4	4	6	6	4	4	5	5	5	5	*Organization has design and control to help achieve its goals*
2.72																*General average of the box*

The search mechanisms box study shows an optimal function of this box in general, the average of this box is 2.72 significantly lower than the neutral value of 4. In depth commentary on the elements of the box shows optimal functioning in all components except for the design and control component of the school that should help achieve the goals of the school. **Conclusion**: The teachers assist in the ideas of the school principal or staff, teachers have enough knowledge and experience to do their jobs, the school has coordinators with active coordination and

mutual assistance of all the various elements of the school. On the other hand, at the school under discussion, there are no planning and control mechanisms to help him achieve his goals. **This is why work is being done, especially by establishing design and control mechanisms** to help improve the school's goals.

Enterprise change box

Average	*The question score*															*Position a change*
1.93	1	2	1	2	2	3	3	2	2	1	1	3	2	2	2	*In our organization, there is no opposition to changes*
4.67	5	4	4	4	5	4	6	5	5	6	5	4	4	4	5	*Our organization has not enough new innovations in policy and management*
4.73	6	6	5	5	5	4	4	4	5	5	5	5	4	4	4	*Our organization believes in changes*
2.13	2	2	2	3	2	3	2	2	2	2	3	2	2	1	2	*Sometimes I like to change things at work*
2.27	2	3	3	2	1	3	1	1	2	3	4	2	3	3	1	*Our organization has the ability to change*
3.15																*General average of the box*

A table of reference shows an optimum function of the box and the willingness to change in your school, the overall average of the box is 3.15 and is taken from the neutral soft 4. In-depth look from this box shows an optimal function in three components of this box and their average is 4 plus two elements whose behavior is poor and their average is over 4. **Conclusion**: There is no objection to changing the school, teachers occasionally like to change things in their roles and schools are capable of changing. On the other hand, the school does not change and renew, and upgrade its policies and procedures and he does not believe in a change, according to teachers.

Analyze under open systems access

The basis of this approach assumes that the organization is receiving resources from the environment and processing it to other shapes in the conversion process, thus making it more throughput with value added to its environment. In the case of the school, the major components are in line with access to the open systems. Key concepts will notice how to interact with the school and its environment, with the approach of open systems:

Inputs: People, budgets and knowledge. One of the primary roles of the school principal is to integrate the various requirements of the various interfaces in school. These interfaces are students who are waiting for a relevant and useful curriculum that will prepare them for higher education, teachers who are expecting the salaries of teachers and conditions of employment and community who are expected to have high achievements of students and higher education to their own ones. The teachers' inputs are divided into three types: Human (teachers, students, managers, workers, etc.), Hummities (buildings and infrastructures, tables, books and sports facilities) and restrictions (expectations of parents of educational and values in the firm).

Convert: At this point, the school transforms the input into its output. In school, the inputs are on teachers through teaching processes and learning about the achievements of students and education.
Productivity: Yields include students' achievements, teachers' performance, students' growth levels, student server and team substitution, team oversubscription, students and students' absences, teacher admin relations, school attitudes, and team satisfaction.

Feedback: The response of the external environment for the output made in the school.

In the context of the on-premise organization security, an issue is evident in the conversion process that affects school output. The school enjoys all the resources the Ministry provides to the schools, but the process of converting these yields is malfunctioning, which is affecting the quality of productivity.

As the OP arisotes from the Oscarecotonical development of the questionnaix can be seen, the management has malfunctions and shallow relationship. This poor function is reflected in a regular team alternative due to many requests to move from school, frequently absences from staff and bad relations with management. All these elements are evidence of a lack of organizational belonging and a challenge to the organization and its objectives and policies.

Conclusion: The school management should work on a new examination of the process of converting inputs in a way that will ensure desired throughput that their expressions are motivated to work, satisfaction, social sense, and organizational affunions of teachers.

The diagnostics findings

1. Gap between the foreseer and the common in the box of objectives. This box does not functioning optimally at the general level and at the whole standard of components,
2. Gap between expected and found within building box. This box does not optimally perform at the general level and at the whole level of components, except for an organization of the work unit in a good and efficient manner,
3. A gap between the expected and within the leadership box. This box does not optimally perform at the general level and at the all-inclusive level of elements.
4. There is no gap between the observer and the lie in a box of rewards. This box functions optimally at the general level. At the component level, there is a gap between those in the components that are extract: The promotion and element of tasks in various incentives.
5. There is no gap between the expected and found on the support services box. This box functions optimally at the general level. At the component level, there is a gap between those in the district on the part of planning mechanisms and the battle to help achieve the school's goals.
6. There is no gap between the expected and existing lines in the position box toward change. This box functions optimally at the general level. At the component level, there is a gap between those in the components that are extract: The belief in changes and innovation in the field of regulations and policies.

Conclusions and recommendations

Conclusions

The conclusions drawn from the enterprise diagnostics lead to that some enterprise components do not work properly. Furthermore, some boxes that work properly, some elements in those boxes do not work properly, and they are charged with improvement. In general, the textbox, structure, and leadership work improperly, and there is a necessary need to improve these boxes in order to improve the performance of the school and to recruit the educational team for the purposes of the school and to develop positive psychology and positive organizational culture such as organizational belonging, increase change, work, and etc.

As to a revelry, their schools are not material reprisals because they have no independant budget and are receiving their resources from the Ministry of Education and the local authorities. The only compensation that the book can embrace is the peace that is psychic as positive, encouraging, letters of thanks, Zion for praise, etc.

The school should look at its policies and procedures so that they will be helping to achieve the goals of the organization, and the personal and group needs of teachers.

Explain the required changes

The necessary changes, as mentioned above, should focus on making the decision to all the work factors in the school: Teachers, students, parents and professional staff like a psychologist and educational counselor. Clarifying the goals will help all those elements know the goals, identify them and anchor them in their consciousness so that all the school moves toward achieving these goals. The absence of clear and transparent targets spreads the school's resources in vain, because there is no focus on concrete aims. In this context, the vision of the house should anchor these goals and be able to collaborate with the entire bodies and to recruit a wide coalition for achieving these school goals.

In the context of the structure, role-playing and period allocation and job division will greatly assist in achieving the goals of the school. Role distribution and professionalism in roles is blocked from educational teams from developing a feeling of empathy and dissatisfaction that causes significant damage to school productivity.

In the context of the leadership, the leader of the house has a book about the character of the director and his deputy, to be inscribed with teachers, their advisors, their address to the plight and the consultation. A less enlightened approach by the manager will be able to develop the teachers in the process and productivity of the school while empowered management access can be a contributing interest to the development of positive feelings that will help the end of school's goals.

The school must also deal with the conflicts that are in a "on hold" state as soon as possible. Such conflicts can waste the material and mental resources of the teachers and will hurt the quality of the school along with a negative organizational culture.

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Appendices

Appendix a concentrates the diacritics of the questionnaires

Average																Purpose
4.13	4	4	3	4	6	4	4	3	5	5	5	4	4	4	3	The aims of our organizations are defined and clear
4.87	5	7	5	7	6	4	4	4	4	4	4	5	5	5	4	The staff and me identify with the tasks that we have placed on us
5.67	7	7	5	5	6	6	7	6	6	5	5	5	6	5	4	הארגון מטרות את ויודע מבין אני
5.13	4	5	6	5	7	6	6	6	5	5	5	4	4	4	5	הארגון של העדיפויות סדרי את מבין אני
4.93	4	6	5	4	5	5	5	5	5	6	5	6	5	4	4	מהממונים התערבות פחות עם הצוות יעדי את לקבוע שואף אני
4.95																ממוצע
																מבנה
4.67	4	5	5	4	4	4	5	5	5	5	5	6	5	4	4	גמישה עבודה חלוקת קיימת בארגוננו
4.47	6	5	5	4	4	4	4	4	5	5	5	4	4	4	4	היעדים להשגת מכוונות בארגוננו התפקידים הגדרת
4.67	5	5	5	5	5	6	4	5	6	4	5	4	4	4	3	והגיונית ברורה בארגון התפקידים הגדרת
1.40	1	1	2	2	1	1	1	2	2	1	1	1	1	2	2	ויעילה טובה בצורה מאורגנת שלי העבודה יחידת
4.33	4	4	5	5	4	4	5	5	5	5	4	4	4	4	3	המטרות להשגת מסייעת בארגון העבודה חלוקת
3.91																ממוצע
																מנהיגות
5.07	6	5	4	5	4	5	5	4	6	6	6	5	5	5	5	שלי הישיר מהממונה לגיבוי זוכים מאמצי
4.87	5	4	5	5	5	6	4	4	6	5	5	5	5	5	4	מתפתח הארגון, בארגונינו הקיימים המנהיגות דפוסי בזכות
5.20	4	5	5	4	6	5	6	5	5	5	5	6	6	6	5	הארגון מטרות להשגת ומסייעות תורמות ההנהלה פעולות
4.73	5	5	6	5	6	4	4	4	5	5	5	5	4	4	4	ברורות הנחיות עלי מהממונה מקבל אני

5.27	5	6	6	6	6	5	5	5	5	4	5	6	5	5	5	נכונה בצורה פועל הוא ,הצוות על להשפיע מנסה עלי הממונה כאשר
5.03																ממוצע
																יחסים
4.73	6	6	6	5	4	4	4	4	4	4	5	5	5	5	4	טובים עלי הממונה עם יחסי
2.40	1	2	2	3	2	4	3	1	3	2	2	3	3	3	2	בעבודה כך על לשוחח מי עם לי יש תמיד בעבודתי בבעיה נתקל אני כאשר
1.53	3	2	1	2	1	1	1	1	2	1	2	2	1	1	2	המקצועי במישור והן החברתי במישור הן וחיוביות טובה העובדים עם שלי היחסים מערכת
1.87	2	3	2	2	1	2	2	2	1	1	1	2	2	2	3	בארגון שנוצרו החיוביים היחסים בזכות עבודתי את כיאות מבצע אני
4.67	5	4	4	4	4	5	5	5	5	5	6	5	5	4	4	פתרונם על באים שאינם קונפליקטים של מקרים בארגון אין
3.04																ממוצע
																תגמולים
2.07	1	1	1	2	4	3	3	2	2	2	1	3	2	2	2	האישית בצמיחתי מסייעת שעבודתי חש אני
2.07	1	2	2	2	1	2	3	2	2	2	2	3	2	2	3	הוגנים ותגמולים לשכר זוכה הארגון מעובדי אחד כל
4.40	6	5	5	4	5	5	6	4	4	4	3	3	4	4	4	לקידום אפשרויות קיימות בארגוננו
1.73	2	2	3	3	2	2	1	1	1	2	2	1	1	1	2	בעבודה ביצועי את התואם שכר מקבל אני
5.33	5	5	6	6	6	5	5	5	6	5	5	5	5	6	5	בתמריצים מלוות בארגון לבצע שיש המשימות
3.12																ממוצע
																תמיכה מנגנוני
2.27	3	1	3	2	2	2	1	1	3	3	3	2	2	3	3	הישיר הממונה של ברעיונותיו מסייע העבודה צוות
1.93	2	1	4	1	2	1	2	3	2	1	1	2	2	2	3	לכך הדרוש המידע כל בידי יש תפקידי את כראוי לבצע כדי
2.07	1	2	2	2	3	2	1	2	2	3	3	2	1	3	2	יעילים תיאום מנגנוני קיימים בארגון
2.53	3	3	2	2	2	3	3	3	2	2	2	3	3	3	2	הארגון של אחרות ביחידות מסתייעת היא ,לעזרה זקוקה יחידתי כאשר
4.80	4	5	6	5	4	4	4	6	6	4	4	5	5	5	5	יעדיו בהשגת לו המסייעים ובקרה תכנון יש בארגון

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2.72																ממוצע
																שינוי כלפי עמדה
1.93	1	2	1	2	2	3	3	2	2	1	1	3	2	2	2	לשינויים התנגדות אין בארגוננו
4.67	5	4	4	4	5	4	6	5	5	6	5	4	4	4	5	והנהלים המדיניות בתחום חידושים מספיק אין בארגוננו
4.73	6	6	5	5	5	4	4	4	5	5	5	5	4	4	4	בשינויים מאמין ארגוננו
2.13	2	2	2	3	2	3	2	2	2	2	3	2	2	1	2	בעבודתי דברים לשנות אוהב אני לעתים
2.27	2	3	3	2	1	3	1	1	2	3	4	2	3	3	1	להשתנות היכולת את יש לארגוננו
3.15																ממוצע

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How to adapt your ESP course to e-learning resources and tools

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Abstract

The goal of this paper is to present a range of e-learning resources and tools and give proposals, ideas, or tips for their application in designing your ESP course. With the sudden uprise of applications (apps) available that encourage teaching and learning English, I have thought of adapting my ESP courses to these online resources to arouse my students' interests and needs. Since traditional face to face interactions are no longer possible today due to COVID-19, I have started adjusting my ESP course by using some interactive tools such as digital images, discussion boards, document sharing, electronic portfolios, social networking, and news feeds to improve my students' language skills. The teaching and learning proposals are provided to encourage an introspective, deliberate approach to the use of each technology tool within your ESP context. The e-learning resources and tools presented and assessed in this paper describe the latest tendencies and developments in technology. Needless to say that the tools used for learning, working, and socializing are starting to mingle. Even though many of these tools were not basically conceived for English language teaching and/ or learning, teachers and learners/ students have accepted their successful potential. Encompassing specific e-learning tools and resources is entirely your choice as an English language teacher because you will have to minutely assess and sort out those tools and resources that best satisfy the demands of your program's particular objectives and learning outcomes, and those that foremost fulfill the interests, and needs of your ESP students.

Keywords: ESP (English for Specific Purpose), digital images, discussion boards, document sharing, electronic portfolio, social networking and news feed.

1. INTRODUCTION

Even before COVID-19, there was already high progress and acceptance of education technology. With this unexpected conversion from the classroom in so many parts of the world, people are speculating whether the assimilation of online learning will continue to linger post-pandemic, and how such a conversion would influence the worldwide education market. I do not pretend to be an expert on online teaching, but I am a practitioner and I strongly believe that the blending of information technology in education will be further encouraged and that online education will in due course be designated and promoted as an indispensable part of school education.

After 17 years of working as an ESP teacher, I came to realize that teaching/ learning English for a specific purpose (ESP) is most compelling when you teach/ learn in a multi-sensory manner. Moreover, when your students are mainly digital natives[1] who communicate and learn via computers, SNS[2] and texting, online teaching will not be a problem for them. Just consider that it is another more appealing way of delivering your lesson, as it is worldwide acknowledged that e-learning can lead to better retention of information, better understanding, and learning. Therefore, you need to take advantage of content-based texts that are both appropriate to your context and at a difficulty degree that you/ your students can grasp. The desired outcome is that your students will learn how to master their ESP vocabulary and how to speak English fluently.

I do think that subjecting your ESP students to linguistic diversity early on is a really useful, pragmatic, and productive thing.

[1] Digital natives is a term introduced in 2001 by Mark Prensky and is referring to a generation who was born and grew up in the era of global technology, including computers and the internet.
[2] SNS stands for Social Networking Service and describes all the online vehiles used for bonding with other people.

When adjusting my English courses for Civil and Mechanical Engineering students to the e-learning tools and resources, I took into consideration the following 3 basic principles:

1. Teaching/ Learning ESP is best when you offer content that is best suited for my students' interest.
2. When teaching/ learning ESP, multiple senses such as sight, sound, speech would be engaged concurrently.
3. Last, but not least, repeated exposure to ESP vocabulary enhances my students' learning outcomes.

In other words, I focussed on a multi-sensory teaching/ learning, eager to transmit an infinite variety of information simultaneously and interactively, which helped my ESP students boost their specific vocabulary, refining their comprehension, and cultivating their spoken English skills. Moreover, the e-learning tools and resources used, focus on texts that displayed correctly constructed sentences which meant an improvement of English grammar as well.

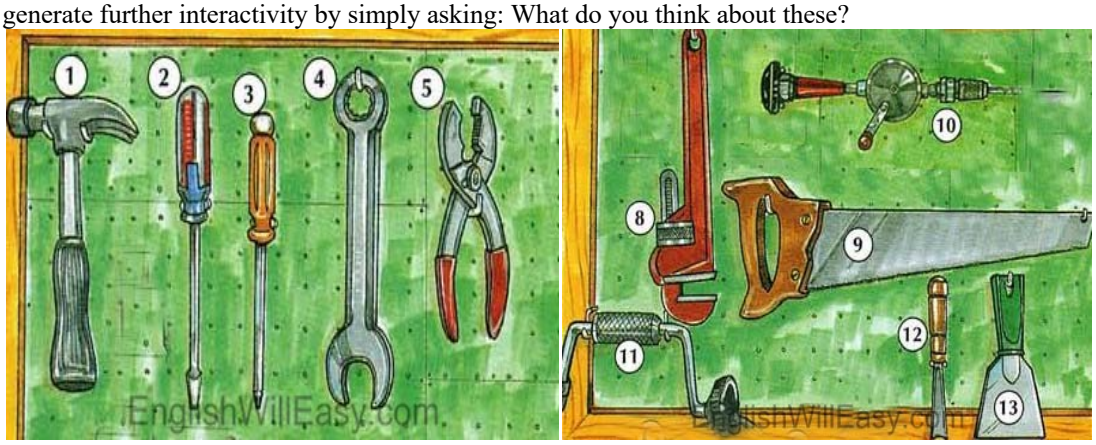
2. DIGITAL IMAGES

Since it is quite difficult to imagine an ESP course without digital images (whether we are talking about photographs, paintings, cartoons, graphics, flashcards or even videos), you need to pay attention to their role, that is to say: are they going to be used as merely aid and support or as a noteworthy constituent of communicating in English, and as a method of cultivating and improving students' communicative skills and creativity.

Whether included in an ESP course, given as hand-outs or posted on social networking, the most essential contribution of digital images is to "add interest to instructional materials and engage learners with meaningful, relevant, and context-appropriate images to support learning"[3].

Therefore, I have started every unit/ chapter of my ESP courses with " large high-impact non-stock images that are being used as a springboard to help establish the topic, activate schemata and get students talking"[4]. After all, using images is almost always helpful for both teachers and students: teachers achieve the intended purpose through a more enjoyable activity, whereas students become more open and confident to perform and fulfill the task given.

Teaching/ learning proposals engaging digital images:
Chapter: Standard operating procedures of hand tools
You can start your online lesson by displaying pictures (or sound pictures) like the ones below and you can generate further interactivity by simply asking: What do you think about these?



(Source:
https://www.google.com/search?source=univ&tbm=isch&q=hand+tool+pictures&sa=X&ved=2ahUKEwjNpsC

[3] https://globalaccess.bowvalleycollege.ca/elearningtoolkit/wp-content/uploads/2016/11/ELearningToolsAndResourcesInESL.pdf
[4] Donaghy, K. & Xerri, D., 2017 *The Image in English Language Teaching,* ELT Council, Malta, ISBN 978-99957-1-151-1. p. 3.

Q887rAhWJohQKHaneCnUQ7Al6BAgKEFw&biw=1366&bih=657#imgrc=F2AmydyoNtra2M&imgdii=twup p6CUUBzvJM)

For a more appealing, interesting lesson, you can spice your teaching method by designing other supplementary picture-related, acting out or speaking exercises/ activities such as these:

Pair work activity and brainstorming.
Ask your students to try to identify/ list as many hand tools as possible.
Compare your lists and then check your answers using the following online glossaries: https://www.macmillandictionary.com/thesaurus-category/british/general-hand-tools or https://www.eslbuzz.com/tools-and-equipment-vocabulary-150-items-illustrated/
Acting out: Ask them to think of a hand tool. Tell your partner about it and ask him to guess it. You can assign pairs and ask them to act out in front of the camera or even record the dialogue.

For the reading and vocabulary activities and as an in-depth digitalize assessment you can upload and share documents on your online platform and ask them to:
Recognize and identify some of the basic hand tools and their proper uses in the construction trade and fill in the blanks with the missing words.
"A ***(1.....)*** is a heavy paper with abrasive material attached to its surface. ***(1.....)*** is part of the "coated abrasives" family of abrasive products. It is used to remove small amounts of material from surfaces, either to make them smoother (for example, in painting and wood finishing), to remove a layer of material (such as old paint), or sometimes to make the surface ***rougher*** (for example, as a preparation to gluing).
A traditional ***(2.....)*** looks like a short plank of wood and often has a wide-body to ensure stability, and that the surface is measured correctly. In the middle of the spirit level is a small window where the bubble and the tube is ***mounted***. Two notches (or rings) designate where the bubble should be if the surface is level. Often an indicator for a 45° inclination is included.
A ***(3.....)*** is a hand-tool for turning (driving) screws (and sometimes bolts or other machine elements with a mating drive system). A ***(3.....)*** will be easy to identify by its tip, which is shaped to fit, or mate with, a screw the head of which has a particular contour, or surface shape. A ***(3.....)*** is, thus, a mechanism to apply torque to a screw.
(4.....) are both cutting and holding pliers. They are often used by electricians and other tradespersons to bend, re-position and cut wire. Their namesake long gripping nose provides excellent control and reaches for fine work in small or crowded electrical while cutting edges nearer the pliers' joint provides "one-tool" convenience. Given their long shape, they are useful for reaching into cavities where cables (or other materials) have become ***stuck*** or unreachable to fingers or other means."
(Adapted from https://www.tangischools.org/cms/lib/LA01001731/Centricity/Domain/5179/Mod3HandTools.pdf)
Write a word that has a similar meaning to the underlined part:
"1. This tool combination allows you to turn a nut or a bolt without repositioning the tool on the fastener — as it happens with a wrench when there isn't enough room to turn it in a full circle. = s _ _ _ _ t w _ _ _ _ h
2. A tool used to tighten or loosen screws that have a straight, linear notch in their heads. = f _ _ _ _ e _ d s _ _ e _ _ _ _ e r.
3. A tool with a fine-toothed saw, originally and mainly made for cutting metal. = ha _ _ _ a w
4. A tool used to drive nails into a wooden surface, to shape metal, or to crush/ smash something. = h _ _ _ _ r
5. This tool is used whenever you need to cut tape, cord, cardboard, or other packaging material. = u _ _ _ _ _ y k _ _ _ e"[5]

Since video meetings, live chats, and video tutorials posted on YouTube can be used for a wide range of purposes, you can share appealing, relevant videos with your ESP learners. For instance, ask them to watch the video and try to fulfill the tasks:

https://www.youtube.com/watch?v=4o0tqF0jDdo

Mark the following statements as true (T) or false (F):
"1. You can use a hammer and a punch to strike with and make a dimple.

[5] Ioniţiu Ionela, 2020 *English for Civil engineering, Part II*, Editura Universitară, Bucureşti, ISBN 978-606-28-0064-2, p. 14.

2. A ratchet is a driver.
3. A Philips screwdriver has a flat tip.
4. A ball-pin hammer is used for sawing wood.
5. There are three different standard drills.

Answer the following questions:

1. How many tool families are mentioned in the video?
2. What is a double-opening wrench?
3. What is the difference between a socket wrench and a ratchet?
4. What is the difference between a ball-pin hammer and a carpenter's hammer?"[6]

3. DISCUSSION BOARDS in ESP teaching

Discussion boards for online classes offer your ESP students the chance to tackle various course topics, to exchange ideas, and share information with the professor, as they would have done if they were involved in a traditional face to face interaction. Since discussion boards are associated with asynchronous learning, students are provided with better conditions to learn at their own space and pace, which means they are given more time to think about the topic, the language or vocabulary choices they make, and the ideas before replying. Moreover, as discussion boards are regarded as a synchronous means of class interaction in online teaching as well, to enlarge student achievement or create greater student satisfaction or confident booster during the online course, you need to consider several factors:

- Remember that you as a teacher are there to answer their question and to provide feedback, thus encouraging students to gain their knowledge by interacting, online communicating with each other.
- Pay attention to the length of your posts, because students tend to get bored and frustrated altogether if your posts are too long because reading through threaded discussion can get time-consuming.

Teaching/ learning proposals engaging discussion boards

Via WebEx, Discord, Skype, Zoom you name it, you can upload your ESP slides and encourage communication in real-time among e-students by on-screen chats during a session.

To generate your ESP students' interest in the topic **Standard operating procedures of hand tools**, to re-activate their vocabulary and as an icebreaker for the reading/ document-sharing activities, you can display on your screen the questions/ subtopics below and ask them to share information from their personal experience or background:

"What common hand tools do you know?
Which hand tools would construction workers use to build a house?
What tools would be used for cutting metal and sawing wood?"[7]

For a more efficient, productive communication you can divide them into groups and allocate them a certain question/ subtopic/ thread or even ask one of them to act as a moderator. Apart from engaging them with the topic or the course content, you can observe and watch their online discussions as well as stimulate "their critical and reflective thinking and knowledge building in an instructor moderated asynchronous environment."[8]

4. ELECTRONIC PORTFOLIOS in ESP teaching

The electronic portfolios are the direct result of the booming interest in technology and online teaching resources, which are conveniently used today during the pandemic since they are highly motivating for ESP students who are urged to display their work using electronic technologies (Microsoft Office - Word, Excel, PowerPoint -, SNS – Facebook, Discord, Skype -, digital and analog video, and WWW pages).

The most significant characteristic of electronic portfolios is to foster and enhance reflective learning, using topic-specific such as guided-speaking, listening, or guided-writing activities, in which learner self-assessment has a

[6] Idem, pp. 15-16.
[7] Idem, p. 10.
[8] https://globalaccess.bowvalleycollege.ca/elearningtoolkit/wp-content/uploads/2016/11/ELearningToolsAndResourcesInESL.pdf, p. 9.

fundamental role. Since ESP is a student-centered approach as well as a tool for lifelong language learning[9], self-assessment plays a vital role in the evaluation processes, by encouraging students to take full responsibility for their learning.

Regarded as a way to sharpen your ESP students' skills (oral and written communication, listening skills, critical thinking, decision-making and problem-solving, negotiating skills to name just a few), electronic portfolios regularly consist of extensive diversity of materials such as students' written work (essays, descriptions, summaries, dialogues, presentations, e-mails and reflections on their progress), as well as recordings of student discussions, conversations and so on. Differently stated, electronic portfolios are collections of students' work that may be uploaded via e-mail or posted online on other SNS (called 'web folios') as a way of sharing their work to a larger audience.

Teaching/ learning proposals engaging electronic portfolios

Students can include in their e-portfolio the following experiential, elicitative, and exploratory activities such as:

Writing activities
Write a short paragraph (no more than 70 words) describing a hand tool you frequently use.
Comment on the following statement: There are some basic tools that every homeowner should own, whatever their skill level. (200 words)[10]

Or ESP students attending Civil Engineering can improve their creativity, by including a three-dimensional building into their e-portfolio while simultaneously writing an essay such as:

Imagine you are a historical architect. Talk to your team project manager/ partner about ways of refurbishing a building. (200 words)[11]

5. SOCIAL NETWORKING AND NEWS FEED in ESP teaching

People and digital natives in general love technology. And who can blame them? In the last couple of years, the social networking websites have played an indispensable role in our daily life. We live in a world where people are more likely to connect with their electronic devices than with other people. And it makes sense. You can check your phone or laptop at any time of the day or night you want, but you cannot do the same things with your friends as they may be busy with their own activities. In the same way, you can always check for the latest news online instead of sitting tight and waiting for them to be broadcasted. In a way, this online technology offers us an immediacy that other people or things do not.
The global phenomenon of Facebook is a good example of this human-machine relationship. The fact that it offers you multiple possibilities of connecting and being informed has made it one of the most famous social networks in the world.
Social networks seem to have an answer for almost everything you are looking for today. Facebook does a particularly good job when it comes to that. It has this unique feature that is called News Feed which shows the user news about people and things they are interested in. The News Feed has become the place where anyone, American and Romanian users alike, can find news about friends, current and upcoming events, latest trends, and even advertisements. In other words, one of the most essential features of Facebook News Feed is the ability to release an unlimited diversity of information simultaneously and interactively.

[9] Little D. The Common European Framework and the European Language Portfolio: Involving Learners and Their Judgments in the Assessment Process/ D. Little.–*Language Testing*, 2005.–22 (2).–pp. 321-336. http://ltj.sagepub.com.

[10] Ioniţiu Ionela, idem, p. 16.
[11] Idem, p. 176

"The goal of News Feed", Varun Kacholia and Minwen Ji explained, "is to show the right content to the right people at the right time whether it's from a close friend or a news source halfway across the world."[12]

Teaching/ learning proposals engaging social networking and newsfeed

Today's social networks (Facebook, LinkedIn and so) do not only allow you to keep in touch with your friends on a daily basis but also to get the latest news from the fields you are interested in. There are, however, certain boundaries to consider when incorporating social networks into ESP teaching. You need to set a clear cut distinction between professional and personal posts. You can initiate group pages for your entire ESP class and ask them to join, thus creating a network of professional contacts. You can post photos, announcements, advertisements, reminders of upcoming events. To enlarge their personal and professional work-oriented profile, you can ask them to investigate and share information related to a certain ESP topic, to promote and support a cause.

For instance:

Ask students to monitor their Facebook pages during a 24-hour period and count how many posts were related to their area of interest, namely English for Civil Engineering.

Ask them to divide the posts into two simply-recognizable categories: professional and promotional posts.

To cultivate and improve their professional work-oriented profile, ask them to post their resume on various group-related pages, and see the impact on the labour market.

CONCLUSION

It is a well-known reality that nowadays we live in a world governed by technology in perpetual development, a world in which today's amazing new development can become tomorrow's old news. The hasty development of technology is arising at a global level and it is influencing all of us, whether we want it or not.

Online teaching will not change you as a teacher, eventually, you will have to use the same teaching qualities, you will have to be as creative as possible and you will have to bear in mind that the student is again the focus of your lesson. Since it is our job to adjust and to find a better way to deliver our lesson, we should think of online teaching/ learning ESP in a positive mindset, as an opportunity because nowadays online teaching is a must as it is becoming a more active part of our professional life.

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ICTs in students' assessment

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Abstract

Technology has become inevitable part of our life, private or professional. Young generations are considered technology natives, meaning they are very comfortable with technologies. Young people have been using ICTs their whole lives and they do not know the world without technology. Introduction of ICTs in the processes of learning and assessing learnt is normal for them. Schools have understood this and have started introducing ICTs in all spheres of school life. One part of this research was aiming to identify the needs and benefits from the use of ICT in students' assessment. The work on this paper combined the desk research on existing literature and related issues on international level with a survey of 182 Macedonian teachers from urban schools. The research showed that Macedonian teachers should continue to build their capacities in using technologies during teaching / learning process and during extra curricula activities. Also, the research revealed that teachers are aware of the need for continuous professional development especially in the sphere of e-assessment. Experiences from electronic society phenomenon, integrating of ICT in education and assessment are shifting the focus to topics like authentication, safety and security and privacy of gathered data.

Keywords: ICT in education, electronic assessment (e-assessment), user authentication

1. Introduction on assessment

"Assessment of learning outcomes is process of appraising knowledge, know-how, skills and/or competences of an individual against predefined criteria (learning expectations, measurement of learning outcomes)." (CEDEFOP, 2014) Assessment occurs in a variety of situations. One type of assessment is when a student receives information on how he/she has completed a task, or when he or she receives information on how to improve. The purpose of this type of assessment is to provide direct information and assistance to the student in order to be able to progress in acquiring new knowledge. This type of assessment occurs during the process of acquisition of knowledge and skills, not at the end of learning. This is called formative assessment.

Other type of assessment can be aimed at determining the level of knowledge, skills and competences acquired in order to award a diploma or certificate. This type is called summative assessment. Summative assessment is usually conducted as an exam at the end of a course or module and determines whether that module / course has been passed and the student can move on to mastering the next one.

Another type of assessment can be diagnostic. It determines how much knowledge, skills and competences a student has at the beginning of a module or during learning, in order to determine the effectiveness of the learning process. This assessment provides information about the student's level of gained knowledge, skills and competences, previous or current, and helps determine the next steps in work with that student.

Assessment is an important part of learning because it determines the extent of learning success and advices what should be addressed in the future (ANTA). The results of the assessment can also be used to determine the success of the student, the teacher, the group, but also the whole school. Due to the importance of assessment, several approaches have been developed that need to be combined to obtain effective assessment results. Also, if assessment is included as part of the learning process, it can greatly help in acquiring knowledge, skills and competences.

2. Electronic assessment (e-assessment)

Despite the prevalence of computers and new technologies in the learning process, ICTs enter assessment mush slower. The first thought when saying the application of ICT in assessment are usually multiple-choice questions, probably because it was the first way of using ICT in assessment and to this day remains the most

common. However, computer-aided assessment can not only enable multiple-choice assessment, but can also enhance the learning experience by providing information on which parts of the learning content are well-learned and which are rated lower. Another way to apply ICTs in assessment is to submit tasks electronically, which can greatly facilitate the administration in assessment. The least used approach in the application of ICTs in assessment is self-assessment which can have very positive results – it encourages students' independence and helps them acquire learning skills for lifelong learning.

Some of the advantages of using ICTs in assessment are:

- Assessment can be accessed from various locations which facilitates and increases the availability of e-assessment for a larger and diverse population of students.
- Assessment results can be saved and used later. Students' responses can be monitored.
- Various assessment aproaches can be used.
- Assessment aproach can be adapted to the learning needs of an individual student.
- The application of ICTs in the assessment increases and facilitates the efficiency of the administration of the received answers and results.
- Many questions can be evaluated quickly and accurately, and most often the results are obtained automatically. This increases the objectivity of the assessment.
- The order of the questions can be mixed and each student can get the same questions but in a different order and thus reduce the possibility for students to copy from each other.
- Results on achievements can be given / received immediately. Results can be provided to both the teacher and the students. Immediate results can motivate students to work and learn harder.
- Some tests or quizzes can be repeated to practice and re-check knowledge.

Weaknesses in the application of ICTs for assessment are similar to those for the general application of ICT – the necessary finances for the maintenance and upgrade of software and hardware, the need for constant monitoring of innovations and professional development of the staff that uses them. (National Council for Curriculum and Assessment, Ireland, 2007). The possibility of plagiarism and copying by students should also be considered as possible problem when using e-assessment.

E-assessment should be flexible and allow for different approaches taking into account the different needs and working conditions of students using e-learning. (Masemola, 2006) E-assessment flexibility means:

- Delivering assessment tasks to students keeping in mind the conditions and needs of students;
- Providing various options that will enable connection regardless of the different Internet accesses or technologies used;
- Providing offline options allowing independence of time;
- Providing a location of choice for assessment – students can choose where to be assessed: at home, in an organization or elsewhere.

How well these flexibility requirements will be met depends on many factors, including learning and assessment strategies, technologies and software used, how students are administered and their activities, and time constraints (date or day, time) on assessment.

2.1. Does e-assessment change the approach to assessment?

ICTs significantly affect the teaching and learning process by adding numerous new opportunities, which also affects the aspects of assessment. The transition from traditional learning and assessment to electronic will not change anything if the same strategies, methods and techniques continue to be applied. (World Economic Forum, 2015) This is evident from the OECD PISA assessment report (OECD, 2015). Some examples of new opportunities in education available with ICTs would be:

- With the electronic teaching materials, the possibilities of simulations, access from different geographical locations, new huge opportunities are opened for the students. Formal vocational training is no longer limited to the opportunities and resources of the institution where the training is conducted.
- It is already much easier to teach only modules of interest to students. This is especially important in adult learning – access to certain materials of interest in your free time and access from various locations.
- By choosing combinations of training modules, each student can tailor learning material to their own needs.
- Materials should be designed so that they can be accessed and used from a variety of locations at different Internet speeds and through a variety of devices – computers, tablets or mobile phones.
- By providing access from different geographical locations, the materials should be designed to take into account the cultural differences of the users.

- ICT brings together people from all over the world. The effect of globalization should be taken into account in the creation of teaching materials, and thus in the creation of assessment content.

All of the above will obviously affect the content of the assessment. Assessment techniques need to be changed in order to take full advantage of the opportunities offered by current ICT.

2. 2. When to use electronic content for assessment?

Electronic assessment content should meet the same requirements for validity, reliability, flexibility and fairness, and enable the use of many of the traditional learning and assessment strategies. The differences are: the context of the assessment, the interactions between the assessor and the student and the collection and processing of the assessment results. (SQA, 2003)

Electronic assessment content can be used as:

- The only source for assessment,
- Supplementing the traditional way of assessment,
- To collect, transfer and administer assessment materials.

Electronic assessment content allows:

- Greater flexibility in terms of time and place of assessment,
- Wider range of opportunities for students to demonstrate their learning.

2. 3. Possibilities when using electronic content for assessment

The most commonly used ICT-assisted assessment strategies are: application of ICT as a medium for assigning tasks such as essays; creating, filling out and submitting portfolios; and testing such as short answers, quizzes or multiple-choice questions as a choice. Some possibilities when electronic content can be used for assessment are:

- Written assignments / text, for example essays; which can be online or emailed (offline)
- Participation in online discussions, forums and debates
- Publications of student works
- Group collaboration when working on a larger task
- E-portfolios
- Audit and check the work of others conducted online
- Online diaries for self-reflection
- Tests and exams
- Online quizzes or various questions
- Blogs
- Wikis

There is a great deal of interest in using ICT as a tool for learning, but video conferencing or group work and collaboration are still not often used as assessment tools. Although there are sources that report on various innovative examples of e-assessment such as group discussions, various types of case studies or projects, simulation tools, self-assessment, etc., it has not yet become a common practice in schools around the world.

It takes a long time to write and check good questions. That's why it's good to create a bank of proven good questions that can be combined and used multiple times. Each of the users, the teachers, if he/she compiles several questions and all of them are entered in the bank, all the teachers will be able to use all the questions and this facilitates and accelerates the preparation of the teachers for electronic assessment. The interoperability standards of various systems have been developed to allow the transfer of a bank of questions from one system to another, which further facilitates the cooperation of a large number of teachers.

Electronic assessment is not yet easily linked to assessment of students' practical skills. For now, electronic assessment is most often used in the summative assessment of students. This should be combined with other assessment methods to get a complete picture of the student's achievements. The correct application of electronic assessment, with the possibility of cooperation and interaction that demonstrates knowledge, skills and competences is the best and correct way of assessment of students and in that direction should be directed the efforts of applying ICTs in assessment.

Electronic or digital portfolios are increasingly used to record and organize learning activities, and as such can be used for assessment. Among other things, the portfolio demonstrates the skill of selecting, organizing and interpreting various documents and sources of information. Portfolios may contain text documents, hyperlinks, graphs, pictures, work diaries, videos, or other sources that show the student's practical work. All this can be applied when assessing the practical skills and knowledge acquired by the student.

2. 4. Security and authentication for e-assessment

It is very important to ensure the safety and security of the participants during the assessment. Security in electronic assessment is most often associated with:

- Reliability and security of the system so that students (and teachers) are not disadvantaged if the system fails or the speed of work is reduced;
- Integrity of data in the online system;
- Protection against and monitoring of unauthorized access.

Before proceeding with the electronic assessment, it is necessary to resolve the issues related to the security, access and equality of the participants.

The difficulty for the teacher in online assessment is authentication – is the student really the one being portrayed. Different authors give different suggestions on what strategies to apply to ensure the authenticity of online communication and interaction. Authenticity and plagiarism are two topics of great interest to all education systems that use or plan to use electronic content for learning and assessment.

The problem of plagiarism also occurs among university students, with numerous studies claiming that university students copy ready-made texts from the Internet and display them as their own all around the world. But some authors argue that when using electronic content for assessment, the risk of plagiarism is no greater than with standard assessment, because rewriting had always existed. Therefore, strategies to reduce copying and plagiarism should be applied regardless of whether it is electronic or traditional assessment. There are two types of plagiarism: copying whole pieces of text in order to display that text as your own and not citing the original source; or failure to cite the original source due to ignorance or inability to pinpoint the literature used. Therefore, it is necessary to draw attention of students to citing issue and to train them how to correctly find a relevant source, how to use and download from a source, but also how to quote it correctly. Students should be able to find relevant and accurate sources of materials and be able to determine the degree of freedom to use them. It should be noted that there is also software that help determine if a text is plagiarism or not.

Some authors suggest sequential tasks used for e-assessment, in which each subsequent task depends on the result obtained from the previous one and thus prevents copying from a source. The student must develop a document that will fit the given task that is unique to him/her. Another strategy is to choose work topics that will be discussed and determined with the students either in class or in an online discussion. The application of portfolios with a selection of results from their own practical work also makes rewriting impossible. The teacher should determine which tasks will be critical in defining the student's grade and therefore apply the appropriate strategies.

If dealing with question banks, provide a different order of the questions for each student. Although they would collectively have the same questions, the different order prevents them from copying from each other. Changing the order and the given answer options makes it even harder to copy from each other.

If electronic assessment is used in a particular laboratory, the search engines should be set to safety mode. Most search engines ensure that only one content is viewed and no other window can be opened, which reduces the possibility of parallel Internet browsing and rewriting from there.

There are some electronic tools that enable complete monitoring of each student's work, communications and progress. But this may rise some ethical considerations and concerns. Thorough privacy and confidentiality of online learning or assessment content is required to ensure that students feel free and comfortable working and learning in that online environment.

Regular and safe storage / recording of data is very important when using ICT in assessment. Data storage should be at least once a day, but also is needed immediately after each assessment. Because data only exists electronically and there is no other (paper) copy, it is important that all data are stored in another secure location.

2. 5. Student responsibility in e-assessment

Online learning by its nature provides students with greater freedom and the opportunity to develop problem-solving skills, both technical and professional skills. The fact that students learn most often at a time of their choice, independently of other students and the teacher, imposes a greater responsibility on them to achieve the desired results. If the same principles are applied to assessment, students can use electronic content for self-assessment and assessment of classmates, discussion forums, also taking into account the timing of posts or quizzes. However, the challenge of defining a final grade remains solely teacher's responsibility.

3. Research findings

3. 1. Experiences from the application of electronic learning contents

A large number of computers have been installed in Macedonian schools in the past. Teachers have received laptops for their preparation. One question of this research was aiming to obtain information about the experiences of teachers from the application of electronic content in teaching. When asked what electronic content is used, most of the teachers who answered this question said that they use their own teaching / learning materials. In Macedonia in the recent years large number of textbooks have been written on almost all subjects / courses that are mandatory for use in teaching and they are also available in electronic format. Why teachers still use their own materials could be the subject of another study.

Those teachers who wrote that they use their own materials stated that they use them for new content, but also for assessment and self-assessment of students. It is obvious that some of the teachers have a good understanding of what electronic content can be used for, and they have experience in that. But the number of such teachers is small, and very important in the development of quality of Macedonian education is to increase their number. Some teachers even stated that they published their materials in the cloud which is even more advanced usage of available technology.

Some teachers stated that not all students are active in using electronic content. Others wrote that using electronic contents has increased the interaction between teachers and opened up opportunities for collaboration and teamwork, as well as has motivated students to research more and acquire new skills. Faster access to data and access to more information, increased creativity of students, arose desire and interest among them for subjects are just a few of the benefits of using electronic content according to teachers. The experience of some teachers shows that students are more motivated and more interested while using electronic content for learning. Electronic contents are seen as an aid to the teacher in teaching and provide an opportunity for greater visibility in teaching.

At first glance, the above observations are contradictory**. If we analyze more deeply, we will see that the introduction of ICTs and electronic content is not a solution and cannot automatically increase the quality of education.** Therefore, not all teachers have a positive experience with the use of electronic content. The introduction of ICTs and electronic content in teaching should be accompanied by changes in the approach to knowledge transfer and use of those materials. Electronic content should not be treated as just an electronic book. When it is understood that the approach needs to change, only then positive results can be achieved in learning and teaching with ICTs. This is revealed by those teachers who have a positive experience in the application of electronic content because they have changed the approach and expectations.

English language teachers have experience in applying the Thinkquest project and approach. With these activities, in addition to learning the language, students gain skills in using ICTs, but also have the opportunity to collaborate with students from different parts of the world. The positive experience of English language teachers should be transferred to other teachers and subjects too.

According to the experience of teachers, the learning with the help of electronic content is more durable and easier to apply in everyday life. At the same time, according to some teachers, it takes less time to master the learning content and more time for other activities during class.

The fact is that this approach is not sufficiently covered and developed in Macedonia and that **much more time should be devoted to increasing the capacity of teachers for effective application of electronic learning content. Resources in Macedonian language adapted to the curricula will greatly contribute to the greater use and utilization of the existing ICTs in order to increase the quality of learning. Technical support also needs to be improved so that the prepared learning content can be applied effectively**.

3. 2. Experiences from the application of electronic content in assessment

There was an open question about teachers' experiences in using electronic content for assessment. This question was asked to gather information, if existing, on the ways and experiences of using electronic content in assessing students' achievement. Teachers who use electronic learning content do not always use ICTs in assessment. That is why this question is asked separately.

There was an opportunity not to answer this question and some teachers have decided not to answer it. In the question instructions the teachers were informed that if they did not have experience in any of the topics, they do not have to answer this question at all. Therefore, it would not be wrong to assume that at least **half of the respondents have no experience with electronic content in assessment**. Some of the respondents stated that their experience is negative and they would not use them in education. There were also a significant number of responses which only stated that their experience was positive and did not provide more detailed answers. Below are elaborated the answers that describe in more detail the experience of the teachers.

Teachers who responded that they use electronic content for assessment have a wide range of experiences and ways to apply them. Some wrote that they use short quizzes at the beginning and end of the class for self-assessment of student. Others wrote that they use ready-made online tests. There is a section in Edubuntu that is used by some of the teachers to create questions and tests on their own, with which the students immediately get complete pictures of their learning achievements. Some teachers have stated that they use Moodle, in addition to teaching and grading students. The results of these tests are made available to both students and parents.

Some of the respondents equated the use of electronic content for assessment with the use of an e-diary. An e-diary is actually an administrative tool that only keeps information about students' attendance at classes and the grades they receive. Parents can access this information and see how their child is progressing. The e-diary software does not define a cumulative grade for a student or any other new data, but only transmits information that teacher has entered. An e-diary is by no means an assessment tool. These findings inform us that, at the very beginning, **teachers should receive exhaustive information about the existing e-assessment tools, ways and opportunity for assessment using ICTs**. Then, teachers should be trained how to apply some already-made online assessment tools.

Some teachers stated that they are satisfied with the use of electronic content for assessment because they facilitate and speed up the assessment. At the same time, the student can relatively quickly get information on how he/she performed at the e-assessment. It is also possible for parents to have insight into their child's grades and results. A positive aspect of using tests for e-assessment, according to several teachers, is that after testing students can go back to the questions they answered incorrectly and check what they have learned well, and what they need to pay more attention in the future in order to have better results next time.

Some teachers pointed out that this assessment is used in project work. These activities are most often carried out using ICTs, students research various sources, prepare documents that they send to the teacher electronically, and in some cases, teachers use them for self-assessment or peer-assessment.

Those teachers who have experience with the use of electronic content for assessment emphasize that in order for a teacher to be able to create content for assessment, he/she **should have a higher level of ICT proficiency**. According to them, the **e-assessment is most effective if combined with other types of assessment, such as oral or written assessment**.

4. Conclusion

ICTs have entered most of the areas in our lives, personal and professional. However, the most underrepresented area is assessment in education – the area where ICTs have not penetrated a lot or enough. There can be several reasons for this. One of the findings of this research and from international literature is that simple introduction of ICTs and electronic content cannot automatically increase the quality of education; there much more complex preparation and activities to be performed in order to have efficient use of ICTs in education and subsequently in e-assessment.

Teachers do not have enough experience in implementation of ICTs in teaching and learning, especially in assessment. More time should be devoted to increasing the capacity of teachers for effective application of electronic content for learning and assessment. Resources in Macedonian language adapted to the curricula will greatly contribute to the greater use and utilization of the existing ICTs in order to increase the quality of learning. Technical support is crucial so that the prepared learning / teaching materials can be applied effectively.

One of the initial focuses of teachers' capacity building should be put on exhaustive information on the existing e-assessment tools, ways and opportunity for assessment by using ICTs. The e-assessment is most effective if combined with other types of assessment.

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Evaluating the impact of COVID-19 on employees' productivity of public administration

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Abstract

This paper aims to evaluate the impact of COVID-19 on employees' productivity of public administration, considering the obliged remote working conditions. To do so, a survey with 205 public administration employees was conducted in Albania, during June 2020. Based on a wide review of the literature, four hypotheses were built. After checking for control variables, the data analysis reveals that the remote working productivity, as a result of the pandemic period, positively influence employees' productivity. Moreover, the utilization of information technology positively impacts remote working employees' productivity. This paper closes with theoretical and practical implications.

Keywords: COVID-19, public administration, employees' productivity.

1. Introduction

The most common 20th century's works are non-traditional, contractual, freelance, e-lance, contingent, temporary and remote working. To the standard employees, who according to the literature are considered those who are working at the firm location a fixed number of hours with an expectation for a long career, are added other types of employees who do their job differently, connect differently with the firm and view their career from a different perspective. The great prevalence of this phenomenon has led scholars to think that the bureaucratic model with large companies, through which work has been organized mostly since World War II, is becoming increasingly obsolete.

According to Forbes (2020)'s publication, many employees prefer to work from home if they are not confined there. This new form of working is expected to provide an increase in productivity, but these benefits have not been released because organizations use it as a "secret weapon" (Westfall, R., D. 2004). Despite mentioning above that remote working is the newest form added to the standard employees, working outside business premises has been forecast since the '50s (Asaari, M. H., & Karia, N. 2007) and it was Jack Nilles who coined the term "telework" in the '70s, while stuck in traffic (Kurland & Bailey (1999). Nevertheless, according to these authors, telework did not become practical until personal computers and mobile modems developed at the beginning of the '70s.

Like the standard employee's definition stated above, telework has its definition: "tele"—represents distance and "work" — is described as the activity to make a living. Namely, telework represents distance employment. Telework does not necessarily mean working from home. One can do his job — respond to the customers, draw up business plans, etc. — wherever he is located. A study conducted by Prithwiraj Choudhury in the U.S. Patent and Trademark Office tried to compare two company policies. The team found that employees with liberal "work-from-anywhere" arrangements were 4.4% more productive than those who followed a more traditional "work-from-home" policy.

The COVID-19 pandemic that spread in March 2020 in Albania made social distancing affect daily work. Many of the public institutions allowed some of their employees to work at home, while others still worked on institution premises. However, working outside the institution premises had not been encountered before, so this new form of working may be given an effect on employees and consequently then on the institution. The problem was that change on work premises happened suddenly. Employees were not trained to work alone in an isolated environment and without the supervision of superiors. On the other hand, this was the best solution that could

have happened to the institutions, otherwise they would have stayed closed for a very long time. Related to this problem, this study aims to find out how well employees of public institutions fit in with this new policy of working home, knowing that the new work environment will require them to be isolated, to work without colleagues or supervisors, to eliminate daily coffee and lunch break routines with colleagues. Here, we don't know whether during the pandemic period employees have fit in well with this new form of working. Accordingly, the **research question** that this paper responds to is: **"How did remote working during quarantine impact employees' productivity of the public sector?"**

To do so, this paper is organized into five sections. Section 2, provides a brief review of the literature that explains the productivity's viewpoint and discusses the theoretical framework and hypotheses establishment. Section 3, explains the method and data used for testing the hypothesis. Next, the fourth section presents results while the last section sums up with some practical conclusions.

2. Literature review

2.1 Remote working employees' productivity

According to Martinez-Amador, J., (2016)'s study, productivity is the ratio of what is produced to what is required to produce it. This paper will address productivity at the individual aspect of the remote working employee. According to this context, authors define productivity at the individual level as a perceived benefit of working from home. The sources of these benefits are flexible working hours, reduction of distractions or interruptions from colleges, and accidental absences. Also, the dissertation of Martinez-Amador, J., (2016) adds that remote working employees are more loyal, less inclined to avoid working hours, and less tendentious to change employer.

This study will measure remote working employees' productivity through several items, explained in the third section of this paper. The following section shows the model that is used to determine factors that affect the remote working employees' productivity.

2.2 Theoretical model and hypothesis development

2.2.1 Theoretical research framework

The theoretical model used to measure remote working productivity is the socio-technical model. This model was chosen because of including variables that match the COVID-19 pandemic situation (social and technological subsystems). Employees, regardless of their choice, were forced to stay away from colleagues and use technology to get their job done.

The technical subsystem deals with "processes, tasks, and technologies needed to transform inputs into products" and the social subsystem deals with people's attributes (e.g. attitudes, skills, values), interpersonal relationships, reward systems, structures, and authority.

This theory proposes that these subsystems can never be independent, but they are always in full interaction with each other. Socio-technical systems were first mentioned by Emery and Trist in 1960 (Gordon Baxter, Ian Sommerville, 2011). According to them, the reason for using this model was to describe systems that include a range of aspects of people (personnel subsystem), machinery (use of IT), and the environmental (organization subsystem) aspects of the work system. The theoretical framework of this study is as follows and will discuss them in the third section of this study.

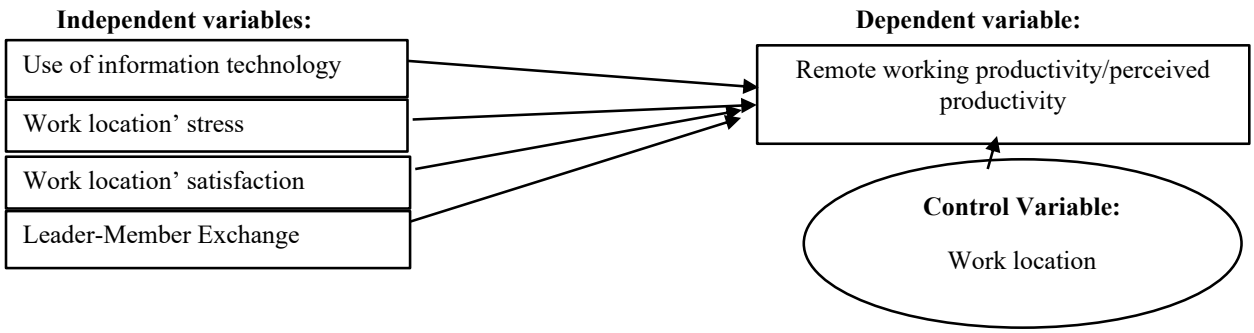

Figure 1. Theoretical Research framework
(Resource: *"Martinez-Amador, J. (2016). Remote and On-Site Knowledge Worker Productivity and engagement")*

2.2.2 Hypotheses development

Use of information technology (IT)

A range of tasks is performed by remote working employees through e-mail or enterprise transaction systems (Chen, L., 2008). According to the literature, technology enables remote working to promote the speed of communication and data transmission between employees and the organization. Technology is the most important variable that affects productivity, especially for remote working employees, and the main reason is the deterioration of internal processes because of the lack of company premises, such as lack of organizational communication and control (Martinez-Amador, J., 2016). Concerning the work of Martinez-Amador, J., (2016), an increase of the quality of internal processes while working remotely is expected to reduce negative effects such as isolation, role conflict, ambiguity, and address the difficulties of coordinating with colleagues or supervisors. General technological work tools such as email, video conferencing (Skype, WebEx, etc.), other forms of written or video communication and company intranets are used to notice the impact they have on productivity. Based on the above discussion, IT utilization is an important variable that explains productivity's variance, as long as technology enables communication, speed, and acceleration of individual productivity. Findings of Martinez-Amador, J., (2016) show that IT utilization is the most important variable that explains remote working employees' productivity. As such, the following hypothesis can be tested:
The first hypothesis: *IT utilization has a positive impact on remote working employees' productivity.*

Personnel subsystem

The human aspect of the socio-technical theory is related to employees: knowledge, skills, attitudes, values, and needs they bring to the workplace. According to Timothy Golden (2007), traditionally working in an office means that employees will share physical space and besides formal meetings will interact with each other for casual meetings in the hallways while drinking coffee/tea. Such interactions influence employees to form common beliefs, societies, and share both professional and personal aspects of life. Despite this argument, the author adds that the number of remote working employees is increasing and is replacing traditional employees, therefore these mutual meetings and talks will no longer occur. Exactly this change of social environment is likely, according to the author, to be reflected in several implications for remote working employees, as follows.

— *Work location' satisfaction*

Based on the work of Timothy Golden (2007), the satisfaction that employees have with their office colleagues was quite significant for organizational success. The author adds that the new remote working environment alienates employees from each other, hence human nature must be taken into account. As long as the traditional employee has to cover the jobs of the remote working employee, he gets additional tasks. Because of this, an employee who works on business premises tends to feel tension and inequality or even jealousy. Therefore, the author claims that an employee who traditionally works in a business environment has a lower level of satisfaction

compared to a remote working employee. Based on the literature, knowledge workers[1] seem to appreciate the flexibility of different types of work (including remote working) and has been identified as one of the main drivers of productivity. Based on the findings, work location' satisfaction is positively related to employee productivity and has a stronger relationship for remote working employees than for those working in a company environment. Therefore, the hypothesis that will test is as follows:
The second hypothesis: *Work location' satisfaction has a positive significant impact on remote working employees' productivity.*

— *Work location' stress/tension*

According to Kelliher, C., & Anderson, D. (2010), the stress level of remote working employees is low. One of the reasons is that employees do not need to go to work or spend time and effort getting ready. To some extent, employees reduce the stress of getting ready for the day suit, catching the bus to go to work, etc. Related to the study conducted by Martinez-Amador, J., (2016), stress/tension that comes from the feeling of isolation or the work environment doesn't harm employees' productivity. As such, the following hypothesis can be tested:
The third hypothesis**:** W*ork location' stress does not harm remote working employees' productivity, with a non-significant effect.*

Organizational subsystem (Leader-Member Exchange/LMX)

Working from home and the inevitable lack of office environment brings numerous challenges for leaders in monitoring employee effectiveness. Leaders do not have the opportunity to get to know employees as long as working from home does not always result in building interpersonal relationships as direct contact does. Therefore, this variable focuses on the relationship that a leader builds with subordinates. Based on previous research, findings show that leadership-member exchange (LMX) has a positive non-significant impact on remote working employees' productivity. As such, the following hypothesis can be tested:

The fourth hypothesis: *LMX has a positive, non-significant impact on remote working employees' productivity.*

3. Research methods and sampling design

3.1 Data and sample

This work was conducted through a case study with 205 participants. Primary and secondary data were used for the study. Primary data are gathered through a questionnaire. This questionnaire is retrieved from the study of Martinez-Amador, J., (2016), and is shared during June 2020 to remote working employees of the public sector through a google form. The time horizon on which data was collected is cross-sectional. These public sector' employees worked at the Financial Supervision Authority and the sampling technique involved in this research was accidental. The questionnaire was self-administered by the employees and consisted of demographic data and constructs that measure dependent and independent variables. The demographic data section in the questionnaire gathered information regarding gender, civil status, years of work experience, the people took care of during quarantine and the working place during the quarantine. All the items of the constructs contained essentially close-ended questions. Each item of the constructs was measured with the Likert scale from 1=unfavorable to 5=the most favorable. The following subsection will show more details about the constructs.
Data analysis procedures were conducted through the 25th SPSS version. The interpretation of the results is illustrated through the inputs in the form of tables.

3.2 Main variables and Measurement

More details about constructs, their items, and the way of measurement are present in the appendix of this research and discussed below.

[1] *Employees who use their brain to do the work instead of their hands. According to the literature they have a high level of expertise, education, or experience, and the primary purpose of their work involves the creation, dissemination, or application of their knowledge (Martinez-Amador, J., 2016).*

Productivity (dependent). This measure is assessed using four items: the improvement of outcomes or outputs, the improvement of capacity to manage a growing volume of activity (e.g., transactions, serve more customers, complete more projects, etc.), the improvement of work processes and overall productivity. The respondents are asked exactly about the items mentioned above. The four-item construct yielded a Cronbach's alpha of 0.873 (refer to Table A1 in the Appendix).

Leader-Member Exchange (independent). The items' number of leader-member exchange' variable is four. The concrete items containing this construct are: the chance that leader would use his/her power to help member solve work' problems and 'bailout' at his/her expense, the chance that member would defend and justify leader's decision when not present, and the working relationship that the member and leader have built. Regarding the reliability test of this construct, the coefficient of Cronbach's alpha was 0.791.
Work location' satisfaction (independent). As related to Table A6 in the appendix of this research, seven items comprised the work location's satisfaction after factor analysis. This construct consisted of these items: the feeling of enjoyment and entertainment while remote working, the feeling of pleasure, competence and enjoyment after remote working, the feeling of being capable of remote working, the level of interest for remote working. The seven-item construct yielded a Cronbach's alpha of 0.939.
Work location' stress (independent). This measure is assessed using five items: the feeling of tense after remote working, the obligation feeling for remote working, the feeling of boredom and pressure while remote working, the feeling of being trapped by remote working. Regarding the reliability test, the coefficient of Cronbach's alpha was 0.794.
IT utilization (independent variable). After factor analysis testing, four items comprised the IT utilization construct. The measurement of this independent variable is based on the use of Video Conference (Skype, WebEx, etc.), Internal Collaboration tools (Google Docs, Doc Sharing, Dropbox), Internal Institution Intranet, Internal employee chat (WhatsApp, Sametime, IM, etc.). The four-item construct yielded a Cronbach's alpha of 0.580.
Work location (control variable). Besides in/dependent variables, the work location constitutes the control variable of this study. All data are gathered while checked before that all public sector' employees had been working remotely at least once a week during the quarantine. Public sector' employees after receiving the questionnaire were first questioned whether they worked remotely during the quarantine. If the answer were no, then the questionnaire stopped asking the following questions, otherwise, it continued to all the questions.

3.3 Empirical model

A linear regression model is employed to determine the factors that are associated with remote working productivity in Albania. This work has used the following econometric model (Equation 1) where Y_i represents the remote working productivity, β_0 represents the intercept, β_1 represents the slope coefficient, X_n represents independent variables and ε_i represents the error term. Although this study is focused primarily on the relationship between the dependent and independent variables, the comparison of R^2 between independent variables is a secondary objective of this analysis.

$$Y_i = \beta_0 + \beta_1 X_1 + \dots \beta_n X_n + \varepsilon_i \quad (1)$$

4. Results

4.1 Descriptive statistics

Before hypotheses testing, diagnostic testing needs to be reported to evaluate heteroscedasticity and non-normality. To do so, multi-collinearity was tested (refer to Table A3 in appendix) using Variable Inflated Factor (VIF). VIF Mean value is accepted as far VIF Mean= 1.33 it is less than ten. To examine linearity, residuals were plotted against predicted values in four regressions: LMX predicting productivity, work location' satisfaction predicting productivity, work location' stress predicting productivity, and IT usage predicting productivity. The scatter plot showed residuals to be randomly scattered around zero and the conclusion was a normal distribution of the data. Furthermore, constructs' reliability and validity testing need to be reported. To do so, Cronbach's Alpha and KMO tests are shown in the appendix (see Tables A1 and A2). As long as Cronbach's Alpha is very close to the value of 1 and the KMO coefficient is more than .7, constructs that measure: productivity, LMX, work

location' stress and satisfaction, and the use of IT are very reliable and valid. Furthermore, these results are significant as long as the coefficient of significance is less than .05.

Regarding descriptive statistics (refer to Table A4 in the appendix), the percentage of female' respondents is higher (80%) compared to the percentage of males (18.5%). The majority of the respondents are single (66.3%). During quarantine, 62.4% of respondents did not take care of anyone, while 16.1% took care of other family members; 14.6% took care of their child; 4.9% took care of both (child and members of their family). Most respondents (41%) have 1 to 3 years of work experience; 22.4% have 4 to 7 years of work experience; 14.6% have 8 to 15 years of work experience and 10.7% have under 1 year of work experience, and 9.3% have over 16 years of work experience. Regarding work location during quarantine, 44.4% of respondents worked from home and 37.6% worked from both home and office. Meanwhile, a small part of them (14.1%) worked in the office only.

Furthermore, Table A1 in the appendix of this study explains constructs' statistics. The mean value of remote working employees' productivity exceeds the average value of 2.5 (out of 5). Also, the same result about LMX and work location' satisfaction was found. Regarding statistics for work location' stress, the mean value is less than 2.5, which means that the work location's stress level is low. As regards IT utilization, the mean value exceeds 2.5, which means that technology is used more than average from remote working employees during the quarantine.

4.2 Hypotheses testing

The linear regression model was used to evaluate the relationship between the dependent variable and independent variables. To assess the hypotheses, the following subsection will show the results of R^2 and unstandardized beta coefficient.

Test of the first hypothesis:

Unstandardized Beta Coefficient (refer to Table 1) shows a positive relationship (.209) between IT usage and remote working employees' productivity. Also, as long as $p < .05$, this relationship is statistically significant. Based on the results of the regression analysis, we can see that this hypothesis is accepted, because if the use of IT grows by a unit, then this would result in a growth of 2.09% of the overall perceived productivity.

Furthermore, 3.7% of the remote working productivity's variance is explained by the technology utilization (refer to Table 2). As stated before, this result will be used later for comparison between variables to find out which of the independent variables can explain most of the productivity's variance.

Test of the second hypothesis:

As long as the unstandardized beta coefficient is positive (.648) and $p<.05$, the relationship between work location' satisfaction and remote working productivity is positive and significant. Meaning that the second hypothesis is accepted. Essentially, this result tells us that with a unit increase in work location' satisfaction, the overall perceived productivity would result in a growth of 6.48%.

Furthermore, related to R^2, 43.1% of remote working productivity's variance is due to the work location's satisfaction.

Test of the third hypothesis:

Unstandardized Beta Coefficient shows a negative relationship (-.506) between work location' stress and remote working productivity. Also, as long as $p < .05$, this relationship is significant. Based on the result of the regression analysis, the third hypothesis is rejected. Namely, with a unit increase in work location's stress remote working productivity would decrease to -5.06%.

Regarding Table of R square, 17% of the remote working productivity's variance is explained by the work location' stress.

Test of the fourth hypothesis:

As long as the unstandardized beta coefficient is positive (.289) and $p<.05$, the relationship between LMX and remote working productivity is positive and significant. The former part of the hypothesis is accepted as long as remote working productivity is positively influenced by the leader-member exchange (LMX) theory. Nevertheless, the latter part of the hypothesis is rejected because of a statistically significant relationship between these variables. Furthermore, related to R^2, 5.5% of remote working productivity's variance is due to LMX.

Table 1. Table of coefficients

Coefficients[a]					
Model		Unstandardized Coefficients		Standardized Coefficients	Sig.
		B	Std. Error	Beta	
1	(Constant)	2.392	.273		.000
	IT Utilization	.209	.083	.191	.013
2	(Constant)	1.051	.185		.000
	Work location' Satisfaction	.648	.057	.656	.000
3	(Constant)	4.262	.211		.000
	Work Location' Stress	-.506	.086	-.411	.000
4	(Constant)	2.092	.325		.000
	LMX	.289	.093	.234	.002
a. Dependent Variable: Productivity					

Table 2. Model Summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.191[a]	.037	.031	.86682
a. Predictors: (Constant), Average IT utilization				
2	.656[b]	.431	.428	.66793
b. Predictors: (Constant), Average work location' satisfaction				
3	.411[c]	.169	.164	.79927
c. Predictors: (Constant), Average work location' stress				
4	.234[d]	.055	.049	.85138
d. Predictors: (Constant), Average LMX				

4.3 Limitations

This study is conducted in a period when remote working was an obligation and not a strategy to facilitate or motivate employees. Also, remote working is associated with a feeling of isolation and fear regarding health conditions not only of themselves but also of their relatives. The sample includes employees who are educated and who are called knowledge workers. Therefore, generalization should be made for public institutions that can work remotely and that their employees have higher education.

5. Discussion and conclusion

The central purpose of this study was to evaluate the impact of COVID-19 on employees' productivity under the obliged remote working conditions. This study used 205 respondents of the public sector and summarized all the findings as follows. The results that are present in Table A1 in the appendix are likely to answer the research question of this study. As such, productivity's mean value of remote working employees is greater than the average value of 2.5 (out of 5). Meaning that remote working during quarantine positively impacted employees' productivity in the public sector. So, there is a positive relationship between the control variable—remote work (work location)—and productivity. Remote working employees of the public sector appear to be productive regardless of the obliged conditions of social distance or health condition issues.

Related to data analyses of R^2, the greatest value belongs to work location' satisfaction (.431). Meaning that this variable can explain most of the remote working productivity's variance compared to other variables. Therefore, the most important variable that public institutions should take into account is, "work location' satisfaction". This result rejects Martinez-Amador, J., (2016)'s finding that IT utilization is the most important variable that explains remote working employees' productivity. Namely, a public sector' employee who is not satisfied with remote working is not going to be productive in remote working conditions, because of their positive relationship discussed earlier. After this comparison, public institutions should pay more attention to the social subsystem than to other subsystems mentioned above.

Also, the findings of this study accept Kelliher, C., & Anderson, D. (2010)'s finding that the stress level of remote working employees is low. However, the positive relationship between work location' stress and productivity stated at the study of Martinez-Amador, J., (2016) is rejected, because related to our findings the work location' stress negatively affects remote working employees' productivity.

Further research needs to be carried out to assess the relationship of remote working' intensity with social and technological variables. This specific future research should use remote working' intensity as a moderator variable between productivity and socio-technical variables.

Appendix

Table A1. Reliability and Statistics of Constructs

Reliability Statistics				**Item Statistics**		
	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items	Mean	Std. Deviation	N
Construct that measure "Productivity"	.873	.876	4	3.07	1.04	172
Construct that measure "LMX"	.791	.796	4	3.43	0.89	172
Construct that measure "Work location' satisfaction"	.939	.939	7	3.09	1.05	176
Construct that measure "Work location' stress"	.794	.811	5	2.34	0.94	174
Construct that measure "IT usage"	.580	.585	4	3.17	1.19	170

Table A2. KMO and Bartlett's Test of Validity

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.860
Bartlett's Test of Sphericity	Approx. Chi-Square	2421.795
	df	276
	Sig.	.000

Table A3. Multi-collinearity test

Coefficients[a]			
Model		Collinearity Statistics	
		Tolerance	VIF
1	Average LMX	.922	1.085
	Average Satisfaction with work location	.632	1.581
	Average Stress with work location	.639	1.564
	Average IT usage	.911	1.098
a. Dependent Variable: Average Productivity			

Table A4. Descriptive Statistics

Descriptive Statistics					
		Frequency	Percent	Valid Percent	Cumulative Percent
Gender	Male	38	18.5	18.8	18.8
	Female	164	80.0	81.2	100.0
	Total	202	98.5	100.0	
	Missing	3	1.5		
Total		205	100.0		
Civil status	Single	136	66.3	67.0	67.0
	Married	67	32.7	33.0	100.0
	Total	203	99.0	100.0	
	Missing	2	1.0		
Total		205	100.0		
During quarantine I had to take care of:	My child	30	14.6	14.9	14.9
	Other members of the family	33	16.1	16.4	31.3
	Both	10	4.9	5.0	36.3
	None	128	62.4	63.7	100.0
	Total	201	98.0	100.0	
	Missing	4	2.0		
Total		205	100.0		
Work experience	Under 1 year	22	10.7	10.9	10.9
	1-3 year/s	84	41.0	41.8	52.7
	4-7 years	46	22.4	22.9	75.6
	8-15 years	30	14.6	14.9	90.5
	Over 16 years	19	9.3	9.5	100.0

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	Total	201	98.0	100.0	
	Missing	4	2.0		
Total		205	100.0		
During quarantine I have worked at:	Home	91	44.4	46.2	46.2
	Office	29	14.1	14.7	60.9
	Home and office	77	37.6	39.1	100.0
	Total	197	96.1	100.0	
	Missing	8	3.9		
Total		205	100.0		

Table A5. Details of constructs and measures

Variable		**Number of items**	**Measurement**
Dependent variable			
Productivity	When working remotely: overall productivity improved (a outcomes or outputs improved (b the capacity to manage a growing volume of activity (e.g., transactions, serve more customers, complete more projects, etc.) increased (c work processes improved (d	4	Ordinal scale, 5-points scale (1= Strongly Disagree, 2= Disagree, 3= Neither Agree nor Disagree, 4= Agree, 5=Strongly Agree)
Independent variables			
LMX	chances that the leader would use his/her power to help member solve work' problems and 'bailout' at his/her expense (a chances that member would defend and justify the leader's decision when not present (a	4	Ordinal scale, 5-points scale (1=None 2=Small 3=Moderate 4=High 5=Very High)
	the working relationship that member and leader have built (b		Ordinal scale, 5-points scale (1=Extremely Ineffective 2=Worse than Average 3=Average 4= Better than Average 5=Extremely Effective)
Work location' satisfaction	When I work remotely, I think about how much I enjoy it. (a Working remotely is fun. (b I enjoyed working remotely very much. (c I feel pretty skilled at working remotely. (d I think working remotely is interesting. (e I would describe working remotely as very enjoyable. (f After working remotely for a while, I feel pretty competent. (g	7	Ordinal scale, 5-points scale (1= Not at all true, 2= Not true, 3= Somewhat true, 4=True, 5=Very true)
Work location' stress	I feel tense when working remotely. (a I don't have a choice but to work remotely. (b I think working remotely is boring. (c I feel pressure while working remotely. (d	5	Ordinal scale, 5-points scale (1= Not at all true, 2= Not true, 3= Somewhat true, 4=True, 5=Very true)

	I do work remotely because I have no choice. (e		
IT utilization	To perform work during quarantine, I used: Video Conference (Skype, WebEx, etc.) (a Internal Collaboration tools (Google Docs, Doc Sharing, Dropbox) (b Internal Institution Intranet (c Internal employee chat (WhatsApp, Sametime, IM, etc.) (d	4	Ordinal scale, 5-points scale (1=Never, 2=Rarely, 3=Sometimes, 4=Most of the time, 5=Always)

Table A6. Factor analyses, Rotation method: Varimax with Kaiser Normalization

Rotated Component Matrix					
	Factor*				
	F1	F2	F3	F4	F5
I enjoyed working remotely very much.	.863				
I would describe working remotely as very enjoyable.	.863				
I think working remotely is interesting.	.858				
When I work remotely, I think about how much I enjoy it.	.843				
Working remotely is fun.	.833				
I feel pretty skilled at working remotely.	.673				
After working remotely for a while, I feel pretty competent.	.653				
Improvement of outcomes or outputs.				.521	
I think working remotely is boring.		.383			
I don't have a choice but to work remotely.		.821			
I feel tense when working remotely.		.807			
I feel pressure while working remotely.		.785			
I do work remotely because I have no choice.		.519			
Chances that members would defend and justify the leader's decision when not present.			.844		
The working relationship that members and the leader have built.			.783		
Chances that the leader would use his/her power to help members 'bailout' at his/her expense.			.733		
Chances that the leader would use his/her power to help members solve work' problems.			.701		

Improvement of work processes.				.760	
Improvement of capacity to manage a growing volume of activity (e.g., transactions, serve more customers, complete more projects, etc.).				.633	
Improvement of overall productivity.				.631	
Utilization of internal employee chat (WhatsApp, Sametime, IM, etc.)					.699
Utilization of internal institution intranet.					.695
Utilization of Video Conference (Skype, WebEx, etc.).					.657
Utilization of Internal Collaboration tools (Google Docs, Doc Sharing, Dropbox).					.536
**Underling dimension in five factors: F1=work location' satisfaction, F2=work location' stress, F3=LMX, F4=productivity, F5=IT utilization.*					

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The impact of big data on business and electronic commerce

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Abstract

Every day, we leave numerous digital footprints in everyday life that can be easily tracked and collected. Due to technology, the path of our actions, as well as forecasts of future actions can also be predicted. Today, information about individuals is better known than before. However, some organizations, enterprises, and government agencies use this information to track and predict our actions. Because, once the data is collected, we cannot control who used it and how it is used.

Nowadays, users cannot perceive their life without advanced technologies and applications. The more a user interacts with the online world, the more information and data is available. Sometimes, even in offline sessions, users also provide some source of information. Thanks to the development of advanced technologies, measurement and data acquisition capabilities are also expanding. As a result, all people find too much information or too much data. So here the question is about the real size of big data. Are big data big enough? How does big data affect business and e-commerce?

This article will be structured as follows. First, after the introduction, the big data phenomenon and its features will be considered. Then the next part will be the influence of big data on the business. The last part will be devoted to the interaction of big data and e-commerce, and the article will conclude with a conclusion on the main topic.

Keywords**:** big data, big data and business, big data and e-commerce, big data features,

INTRODUCTION.

The amount of data in our world is growing rapidly. Companies collect billions of bytes of information about their customers, suppliers, and operations. Millions of network sensors are installed in devices such as cell mobile phones and machines in order to sense, create, and transfer the collected data. Nevertheless, the multimedia and individuals with smartphones and connections to social networks will continue to stimulate the exponential extension of data. (McKinsey Global Institute,2011)

Whether you like it or not, a huge amount of data will be available soon. It may already have reached you. Maybe you've been struggling for a while to figure out how to save it for later access, fix its mistakes and deficiencies, or break it up into structured categories. Now, you can really get something out of this vast database by analysing it and learning about your customers, your business, or some aspect of the environment for your business. Or even if you are not quite there, but you will find the light at the end of the data management tunnel.(Franks,2012)

People have generated data for millennia. Recently, we have seen a huge increase in the amount of data generated since the appearance of mainframes, client-server enterprise resource planning (ERP), and now all digital. For many years, the vast majority of the data received was considered useless. But data has always been an integral part of any business, large or small. Given the importance and value of data for business, the spread of data warehousing within the business has also become apparent. This data was mainly structured, standardized and strictly regulated (either through corporate programs, or through business functions or IT), typical data volumes were within a few terabytes, and in some cases, due to compliance with regulatory requirements, the volume should have increased by several levels. (Mohanty et al.,2003)

1.THE DEFINITION OF BIG DATA.

1.1.**The meaning of Big Data**:In Latin, dates mean "given things"-although in English we use them more as mass nouns than if they relate to a substance.(Jacobs,2009)Big data is the heart of the intelligent revolution.The main idea of the term "big data" is that no matter what we do in the digital world,there is always a digital footprint (or data) that we have left,and that others can use and analyse to become smarter.Drivers in this brave new world are access to ever-expanding volumes of data and our ever-growing technological ability to use this data for commercial understanding.(Marr,2015)

It is important to distinguish big data from "lots data" or "massive data".In a big data resource,all three Vs must match.It is the size,complexity,and turmoil of big data resources that are responsible for the methods by which these resources are developed,managed,and analysed.(Berman,2103)

Big data today is a relevant technology topic.Such cutting-edge topics arise every four to five years and become the "necessary" technologies that lead companies to the Promised Land-the "silver bullet" that eliminates all our technological shortcomings and suffering.Businesses are battling the confusion and exaggeration coming from sellers and analysts to understand what technology can and cannot do.In some cases,they successfully integrate technology into the technological landscape of the company-technologies such as relational databases,Enterprise Resource Planning (ERP),client-server architectures,Customer Relationship Management (CRM),data storage,e-commerce,Business Intelligence (BI) and open-source software.(Schmarzo,2013)

There is no doubt that big data is changing the world.This is already changing our lifestyle,finding love,treating cancer,doing science,improving performance,guiding cities and countries,and doing business.As a result, there is a lot of hype and excitement about big data.Everyone is discussing this.This is a hot topic that is discussed in every boardroom,in every business magazine from-The Economist to Fortune and Harvard Business Review.Big data even falls into the mainstream media.(Marr,2015)

We've all heard a lot about Big Data,but "Big" is a really distracting manoeuvre.Oil companies,telecommunications companies,and other data-based industries have long had a huge amount of data.And as the storage capacity continues to grow,today's "big thing" is certainly the "average" of tomorrow and the "small" of the next week.The most significant definition is "big data,"when the size of the data itself becomes part of the problem.For this reason,data problems between gigabytes and petabytes of data are discussed.In the end,traditional methods of working with data will exhaust themselves.(O'Reily Radar Team,2011)

1.2.The Literature review: There is no consensus on how big data should be defined in the market, but there are a few consistent themes.Two sources have understood the essence of what most agree is that everything is big data.The first definition comes from an article by M.A.Gartner in Q1,2011 Teradata magazine article.He said,"Big Data goes beyond the usual hardware and software environments to within a user-acceptable time frame to collect, manage and process".Large amounts of data are growing everywhere,and the proper use of this data creates a competitive advantage.Ignoring big data jeopardizes the company and leaves it behind competitors.To remain competitive, it is imperative that companies actively collect and analyse these new data sources in order to gain an understanding of what they need.Analysts have a lot to do!It will not be easy to integrate big data along with all the other data that has been used in the analysis for years.(Franks,2012)

Another good definition comes from an article published in 2011 by the McKinsey Global Institute,"Big data is large data pools that can be collected,transmitted,aggregated,stored and analysed-are now part of every sector and function of the global economy."(McKinsey Global Institute,2011)

Generally speaking, big data can be defined as the development of new data sets with huge amounts of data that change rapidly,are very complex and go beyond the analytical capabilities of common hardware environments and software tools for data management.In short,the amount of data has become too large to process using conventional tools and techniques.(Akhgar et al.,2015)

Big data is data sets that are so large in volume,velocity,or variety that it is difficult to store,manage,process,and analyse data using traditional databases and data processing tools.In recent years,there has been an exponential increase in both structured and unstructured data generated by information technology,industry,healthcare,the Internet of things and other systems.(Bahga and Madisetti,2016)

Big data is just one way of describing a data issue,difficulty level,data management tools,data science issues,and the records themselves.Although it was first described with features that D.Laney of Gartner Research originally was responsible for,it is now neatly called "3 V,and the three letters "V" represent volume,velocity,and variety.It is noteworthy that there is an unofficial fourth V: value.(Stimmel, 2015)

Firstly,the definition of big data is converted to 3 V (exploding data, data is generated at high velocity, and data now provides more variety).However,if you search the Internet for the definition of big data,you will find many more interpretations.There are also interesting observations of big data: it is necessary to consider not only 3Vs but also if the amount of data creates real problems for the traditional principles of data management,as well as if it is a big data problem.(Mohanty et al.,2003)

While big data certainly involves a lot of data, big data is not just about data volume.Big Data also has higher velocity (i.e.the rate at which data is sent and received),complexity,and variety compared to past data sources.Neither the fact that big data is big nor the fact that it is data contribute to inherent value.The value lies in how you analyse and respond to the data to improve your business.(Franks,2012)

At this point,you may ask,"Why not just some data?"In the end,many companies have not been able to figure out how to manage their data for some time, right?The general definitions of the popular term for the phenomenon of big data are based on the difference between the functions of obsolete database technologies and new methods and tools for data storage and processing, such as Hadoop clusters,Bloom filters and data analysis tools.Big data is too big data to be could be processed and analysed using traditional database protocols such as SQL(which makes big data a term that can change over time, and now big data can quickly become small s).In this sense, size is just one aspect of these new technologies.(Davis and Patterson,2012)

This stream of new data has required and stimulated technological innovation.Much of this is used by open source initiatives from digital media companies such as Google(Big Table),Yahoo!(Hadoop) and Facebook(Hive and H Base),as well as universities (such as Stanford,UC Irvine and MIT).All of these big data developments can paralyse companies as they wait for process dust to settle before continuing.It is time to move,as the risk of not moving can be devastating.The big data movement is driving business transformation.Enterprises that use big data as a tool for business transformation are moving from retrospective mirroring of their businesses using batch aggregated or sampled data to monitor the business for a proactive,proactive view of business operations.Structured and unstructured data located outside the four walls of the company is delivered in real-time to optimize business performance.(Schmarzo,2013)

Like oil,big data becomes more valuable only when it is "mined",processed and analysed for the relevant data,which can be used to create new values.This cumbrous process is known as big data analysis.Analytics provides a large amount of data and allows you to use them in certain cases.In short,big data goes hand in hand with analytics.Without analytics,big data is nothing more than a bunch of meaningless digital waste.(Bahga and Madisetti,2016)

Big data can be the foundation of next-generation smart applications that leverage the power of data to create smart applications.Big data applications cover a wide range of areas,including the Internet,retail and marketing,banking and finance,industry,healthcare,the environment,the Internet of things,and cyber-physical systems.(Reynalds,2016)

1.3.The features of Big Data: There are several key differences between big data and traditional data sources.Not every big data source has all the following features,but the big data sources have more than one.Key features of big data include:(Franks,2012)

Volume: Big data is a form of data whose volume is so large that it does not fit on one machine.Therefore, special tools and platforms are required for storing and analysing such data.For example,social media applications process billions of messages every day,industrial and energy systems can generate terabytes of sensor data every day, etc.The amount of data generated by modern IT and industrial companies,the Internet of things and other systems are growing exponentially as the cost of data storage and processing architectures has decreased,and valuable data need to be obtained to improve business processes,increase efficiency,and serve consumers.Although there is no fixed threshold for the amount of data that should be considered as big data,the term big data is usually used for bulk data that is difficult to store,process and process using traditional databases and data processing architectures.(Bahga and Madisetti,2016)

Velocity is the speed at which data is created,accumulated,recorded and processed.The growing global pace is prompting companies to process information in real-time or near real-time.This may mean that data is processed on the fly or during "streaming" for quick,real-time decision-making,or that monthly batch processes are performed daily to make more timely decisions.(Minelli et al.,2013)

Variety refers to data forms.Big data is presented in various forms, such as structured,unstructured,or semi-structured, including text data,images,audio,video,and sensor data.Big data systems must be flexible enough to handle such a variety of data.(Bahga and Madisetti,2016)

Veracity:Unlike carefully adjusted internal data,most of the big data come from sources that we cannot control and therefore have significant problems with accuracy or precision.Veracity means both the reliability of the data source and the suitability of the data for the target group.(Sathi,2012)

Value of data refers to the usefulness of data for its intended purpose.The ultimate goal of a large data analysis system is to extract values from the data.The value of the data also depends on the veracity or accuracy of the data.For some applications,the value also depends on how fast we can process the data.(Bahga and Madisetti,2016)

1.4 The characteristics of Big Data. Firstly,big data is often generated automatically by the machine.Instead of one person participating in the creation of new data,they are automatically generated only by machines.When you think about traditional data sources,one person has always been involved.Consider retail or

banking transactions,detailed records of phone calls,delivery of goods, or payment of bills.All this includes a person who does something to create a record.Someone had to deposit money,make a purchase,make a call,send a shipment or make a payment.In any case,there is one person who takes action when creating new data.This is often not true for big data.Many large data sources are created without human intervention at all.For example,a sensor built into the engine gives out information about its surroundings,even if no one is touching it or asking for it.(Bahga and Madisetti,2016)

Secondly,many large data sources are not intended for user convenience.In fact,some sources are not intended at all!Record text streams from a social network site.There is no way to encourage users to adhere to specific grammar rules,sentence order,or vocabulary standards.You will get what you get when people post.Working with such data can be difficult at best,and at worst very,very ugly.Most traditional data sources have been designed to be user-friendly from the start.For example,the systems used to collect transactions provide data in a clean,pre-formatted template that makes downloading and using data easier.This was partly due to the historical need for a highly efficient space.There was no room for unnecessary fluff.(Franks,2012)

Thirdly, big data is usually a completely new source of data.This is not just an extended collection of existing data.For example,using the Internet,customers can now conduct transactions with a bank or retailer online.But the transactions that they perform do not fundamentally differ from what they traditionally did.You just started transactions on another channel.An organization can record web transactions,but in reality,these are the same old transactions that have been logged over the years.(Bahga and Madisetti ,2016)

Because of these characteristics,it is difficult to handle big data and analyse it using a conventional database.Thus,big data can be well managed with specialized tools and technologies such as Hadoop and file systems. (Pavithra et al.,2016)

Thus,big data can be defined as a large volume of high-speed and valuable data that can be collected,disseminated,stored and analysed using technical means.

2.THE IMPACT OF BIG DATA ON THE BUSINESS.

Historically,enterprises have turned to large volumes of data and analytics to inform about strategy and decision-making,so why does big data have such an impact right now,and what are some main advantages?Firstly,the data itself has become easier to collect using web clicks,RFID tags,sensors,loyalty cards and barcodes.Secondly,data has become cheaper to store and analyse using some tools,as big data's the volume and productivity of these tools are constantly increasing.This means that more companies than ever have the opportunity to use new ideas.(Barker et al.,2016)

Companies differ in how they use big data and advanced analytics to gain a competitive advantage.Some companies are very careful because they are not sure where and how to start,and what new technological innovations they need to use to start their journeys with big data.Others take a more aggressive approach to integrating big data and advanced analytics into their existing business processes to improve the organization's ability to make decisions.However,some see much more than just improving their existing business processes with big data.These organizations are aggressively trying to identify and exploit new opportunities for data monetization.This means that they are looking for business opportunities where they can either sell their data (along with analytical data) to others, implement advanced analytics in their products to create smart products or use the information from big data to help them in transforming customer relationships and customer experience.(Schmarzo,2013)

In many cases,big data is not a problem that your business has never encountered before.Taming new large data sources that exceed current scalability limits is a constant topic in the analytics world.Big data is simply the next generation of such data.Analysts are very familiar with these situations.If your organization has tamed other data sources,it can also tame big data.(Franks,2012)

Big data is a combination of transaction data and interactive data.While technology dominates the ability to control transactional datasets,it is interactive data that adds variety and velocity to an ever-increasing reservoir of data and as a result,creates significant challenges for companies.Data,regardless of type,location and source has increasingly become a core business asset for a business and is now categorized as belonging to two camps:internal data (enterprise application data) and external data (e.g.,web data).This has created a new term:Big Data.(Mohanty et al.,2003)

However,big data is perceived differently,possibly because big data is not so much based on technology as it is on business transformation - transforming an organization from a retroactive,staggered,limited amount of data, monitoring the business environment into the predictable, real-time business environment.Big Data is not about business parity or using the same technologies as any other.Instead,Big Data gathers unique and powerful ideas about your customers, products, and operations to change your value creation processes,streamline your key business initiatives,and create new monetization opportunities.Big Data is about making money.(Schmarzo,2013)

There are many ways to use big data to create value in various sectors of the global economy.Many ground-breaking companies are already using big data to create value,and others need to learn how they can do the same if they want to compete.Governments also have an excellent opportunity to increase their effectiveness and value for money when public finances are limited,possibly due to an ageing population in many countries around the world.However,enterprises,other organizations and politicians face serious challenges in unlocking the full potential of big data.(McKinsey Global Institue,2011)

Big data today is more than just a marketing term.In various industries, companies are exploring ways to make more effective business decisions using this unused and abundant information.This means that with the development of big data technologies,more and more business applications are considered that require breakthrough new approaches to computing in both hardware and software.Organizations that want to innovate faster,launch innovative products,and improve customer service must find better ways to manage and use data in both internal and external firewalls.The experience of these companies in the field of big data is characterized by the following categories:(Mohanty et al.,2003)

- innovation,
- acceleration
- collaboration.

The innovation is characterized by the use of standard equipment and distributed processing, scalability using cloud computing and virtualization,as well as the incentive to use NoSQL technologies as an alternative to relational databases.Acceleration-companies in all industries are starting to harness the power of big data,which affects core business processes.Collaboration is a new trend in a big data scenario in which data stocks are commented on,shared and offered as a product of data services.The democratization of data is a key motive for this trend.(Mohanty et.al.,2003)

The McKinsey Global Institute has identified five broadly applicable ways to use big data that offer the transformative potential for value creation and are relevant to how organizations will be designed,organized,and managed:(McKinsey Global Institute,2011)

- Creating transparency through the simplification and timely provision of big data to relevant stakeholders can create tremendous value.
- Conduct experiments to identify needs,identify variability,and increase productivity.As they create and store more transactional data in digital form,companies can collect more accurate and detailed performance data (in real-time or almost near real-time) in everything from product inventories to hospital days to staff.
- By segmenting populations to customize actions,big data enables organizations to create highly specialized segmentation and adapt products and services to meet these needs.
- Replace/support human decisions with automated algorithms.Sophisticated analysis can significantly improve the decision-making process,minimize risks and disclose valuable information that would otherwise remain hidden.
- Innovation for new business models, products and services.With big data,companies can develop new products and services,improve existing ones and invent completely new business models.

Retailers and distributors strive to gather as much information as possible about the lives of their customers in order to better meet their changing needs.Manufacturing seeks to streamline processes.Device calibration parameters can be recorded and refined,and product storage conditions can be monitored to determine optimal conditions that result in minimal spoilage and waste and analytics are also changing something as subjective and human as human resources.Finding and retaining the right people is a big challenge for most companies.Each industry is learning to take advantage of big data analysis,and it is expected that in the foreseeable future,the search for innovative ways to collect,record and analyse data will play an important role in business.(Marr,2015)

3.THE BIG DATA AND E-COMMERCE.

The areas of e-commerce that have undergone significant changes in recent years are often associated with big data.There is an opinion that big data is the future of e-commerce,as it opens up new possibilities for optimizing customer service,improving personalization,analysing customer trends and ensuring secure online payments.

E-commerce is a massive activity that allows users to remotely search, compare and buy goods and services via the Internet.While most of us take this for granted, this type of service would not be possible without big data and its processing power.The use of big data in e-commerce is indicated below:(Pavithra et al.,2016)

- To provide the customer with the best experience;
- To predict user interest and behaviour;
- To use for personalization.

In fact,one of the biggest advantages of big data is simply the availability,visibility,and transparency of information.As companies collect and analyse both structured and unstructured data, decision-makers get a clearer picture of employee performance,product supply chains,quality of service,customer satisfaction,and the competitive environment.(Barker,2016)

E-commerce companies from Amazon to Netflix collect various types of data (e.g.orders,carts,visits,users,links,keywords,catalogues,social data),which can be divided into 4 categories:(a)transaction or business activity data (b)clickstream data;(c)video data;(d)voice data.In e-commerce,data is the key to tracking consumer habits in order to personalize offers that are collected over time using viewpoints and transactions for consumers.(Akter and Wamba,2016)

Big data also includes retail data and crime/intelligence data,location data from mobile devices,and video playback data.It contains voice data from call centres or news.(Davenport, 2012)

A new type of customer behaviour can easily confuse retailers who are not ready for a new trend.At the same time,information collected from this trace,with proper analysis,can even give the trader clear guidance on the behaviour and habits of individual consumers.Big data analysis is a powerful tool to solve these problems and take advantage of opportunities.(Li et al.,2017)

In most cases,e-commerce companies deal with both structured and unstructured data.While structured data focuses on demographic data such as name,age,gender,date of birth,address,and preferences,unstructured data includes clicks,likes,links,tweets,voices, etc.A large amount of customer information is available in e-commerce when customers enter the system.This data is of great interest to decision-makers in companies.Although the importance of big data for strategic decisions is recognized and understood,there is no consensus on the operational definition of big data analysis.(Akter and Wambo,2016)

Big data puts the customer at the centre of corporate strategy.Information on social platforms such as Facebook is of particular importance:users share nearly 30 billion content a day.Online business and e-commerce applications have revolutionized real-time offerings.For many years,Amazon displayed products in the format “customers who bought this product also bought these other products.”(Mohanty et al.,2003)

Organizations strive to improve customer service and better understand customer preferences and behaviour.This deeper understanding helps companies of all types and sizes find new ways to connect with existing and potential customers.This principle is clearly applicable to retail, as well as telecommunications,healthcare,government,banking and finance,as well as consumer products involving end-users and citizens,as well as business interactions between partners and suppliers.(Miele and Shockley,2013)

When it comes to consumer marketing,the potential for big data is huge and some argue that big data is the "Holy Grail" of marketing.Big data combined with the use of mobile devices can lead to offers for people who have high relevance,provided at the right time and (with tracking of mobile and geographical locations) in the right place.However, one of the most important legal issues related to big data, especially in consumer marketing, is data privacy.(Navetta,2013)

E-commerce providers analyse and forecast customer behaviour more cost-effectively and cost-efficiently.There are various predictive analytics applications for e-commerce.It can be used for product recommendations, price management and predictive search.(Vinodhini and Manju,2016)

Personalization has been investigated for its interdisciplinary characteristics in various academic fields,for example,in the areas of business,management,marketing,information systems (IS) and information technology.It is important to distinguish the meaning of the customization before to explore the personalization.,as these both terms used synonymously.Amazon.com's book and music recommendations are a good example of personalization.However,customization occurs when a customer pre-indicates one or more elements of their marketing set.MyYahoo on Yahoo.com allows users to specify elements of their homepage,which is an example of customization.(Kwon and Kim,2012)

Personalization consists of adapting costs to a specific context and user.It can be based on user profile attributes such as geographical location,academic and vocational education,group membership,interests,preferences,opinions, etc.Personalization is used by various web services for various purposes.The purpose of personalization is to provide the best possible response to the current needs of the user with the least amount of explicit information that he/she provides.Many existing systems offer some form of personalization.Google Search personalizes your search results based on information such as your geographic location,IP address,search history,and click-through.Facebook offers recommendations for friends based on the user's social network,which is already known to the service.Many location services use at least the user's geolocation to provide results near the user's current location.(Hu,2016)

There are 4 aspects of personalization:(a)what is personalized (object of personalization),(b)how far things are personalized (level of personalization),(c)who personalizes (the subject of personalization),(d)how to find out customer preferences (preferred method training for personalization).(Kwon and Kim,2012)

The main application of knowledge about big data is that sellers learn to predict the buyer's strategy and study all the optimal strategies to get a good result and the best service based on their search interests.Currently,many big data analysis tools are available daily,including predictive analytics,descriptive analytics,and survival analysis.(Pavithra et al.,2016)

When consumers buy electronic products, they are more likely to use a systematic decision-making process,evaluating certain properties of the product.In comparison,customers who buy film tickets or books are more likely to make decisions based on external keyword attributes.Therefore,when purchasing an electronic product, the consumer evaluates the technical aspects and performance of the product.The problem facing customers today is the amount of online information available to them.Many companies are less likely to use a marketing strategy only when promoting their products on the Internet.(Chong et al.,2017)

Users often buy something or make financial investments through e-commerce services,such as electronic auctions,and payment systems.Due to the availability and economic advantages of electronic commerce, more and more traditional services are being transferred to electronic mode,for example,electronic voting,electronic travellers' checks and electronic invoices.(Lee et al.,2012)

Big data carries risks.One of the risks is that the company is so overloaded with big data that it cannot make progress.Perhaps the biggest risk for many large data sources is data privacy.If everyone in the world were good and honest, we would not have to worry much about privacy.But not everyone is kind and honest.Data privacy must be regulated in relation to big data,otherwise,it may never reach its full potential.(Franks,2012)

The right to privacy was first defined by Warren and Brandeis in their article in the Harvard Law Review in 1890 as "the right to be left alone."(Herold and Hertzog,2015)

Privacy concerns with protecting disclosure of individual's data.Privacy is often confused with security.Security deals with Confidentiality,Integrity and Availability,whereas Privacy deals with appropriate use of an individual's information.(Dehghantanha and Choo,2019)

Later,the IT community became interested in this topic,which involved employees from the field of databases and data mining, as well as employees from the field of data transmission.Companies have three main motivations for using data privacy methods.These are legislation,the company's own interests and avoiding of privacy breaches.At present,privacy is a fundamental right that is protected at various levels,as the Universal Declaration of Human Rights states in its article 12 and the European Convention on Human Rights (ECHR).In the European Union on May 25,2018,the General Data Protection Regulation (GDPR) was applied,which entered into force on May 24,2016.The Regulation combines certain rights related to privacy,such as the right to be deleted and the right to rectification.In the United States, the most important laws are probably the Health Insurance Portability and Accountability Act (HIPAA,1996),the Patriot Act (2001),and the Homeland Security Act (2002).(Torra,2017)

Because big data is used in many industries,it has a strong impact on e-commerce services and plays an important role in business decisions.The use of big data in e-commerce has increased enormously.Many large retailers value the information about this data and help them predict users' interests and offer their customers a relative and interested search when they shop on their website to attract customers by providing the necessary and relevant search queries for products or items.(Pavithra et al.,2016)

Nowadays all e-commerce retails must analyse the big amount of data and manage the products,customers,transactions and take into account the importance of scalability and also mind other factors that will be successful in connection with big data technology.

CONSCLUSION.

Finally,it's obvious that big data is everywhere with its 5V features.Today's e-commerce businesses and organizations such as Amazon,Ebay would not have reached the peak of e-markets if they had never taken advantage of big data.The more data there is in big data,the more business and e-commerce can collect, analyse structured and unstructured data.

Big data's influence on the revenue of companies is undeniable and indisputable.Today's big business organizations with the help of big data can sustain their company's customer behaviour in order to allow them to remain as highly profitable companies in the world business market.By using the big data's advantages companies can develop on how to collect data, to use and secure them.As a result,it will lead them to further business development.

Meanwhile,the impact of the big data on e-commerce is going with 5G speed.Today every business start-ups or e-commerce applications are in contact with to the big data,as it considers the company's future business strategy.

Big data is now able to predict future trends in the e-commerce industry,which will allow e-commerce companies to get ahead of competitors.Predicting future trends,big data can also help analyse online customer

behaviour,as it is one of the main participants in online transactions, and this analysis will allow them to find out the needs and preferences of consumers.

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The Importance of Diplomacy for the Foreign Policy and Modern Diplomacy Challenges

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Abstract

This paper analyses the importance of diplomacy for the foreign policy of the states. The paper is analysing evolution of diplomacy from a new and innovative perspective. The key element in the analysis is a concentration on the relationship between the diplomacy and foreign policy, and between states' needs and the functioning of the foreign policy. Also its related to the history of diplomacy and the ways in which modern diplomacy is conducted.

In the paper we clarify the relations between diplomacy and foreign policy. The terms are often confused, but they are not synonymous. Diplomacy is the most important, but not the only instrument of foreign policy. Diplomacy as a method deals with the articulation of foreign policy. It is about the means, not the ends, of foreign policy. Diplomacy thus serves as an great instrument of implementing foreign policy. In recent times, due to the deepening level of globalization and transnational activities, states also have to interact with non-state actors. Modern diplomacy which is different from the traditional one, requires a variety of skills, in particular: familiarity with the art of negotiation, ability to work in a multicultural environment, and openness to co-operation with different actors, in particular, civil society. Modern foreign policy has become quite complex, therefore the modern diplomacy is facing new challenges as technical develop¬ments and digitization. Also the paper underlined that reflecting general societal devel¬opments, there is need to be absorbed by diplomacy as part of state governance.

Keywords: states, international relations, diplomatic relations, multilateral systems, foreign affairs

1. Introduction

Diplomacy - established method of influencing the decisions and behavior of foreign governments and people through dialogue, negotiation, and other measures short of war or violence. Modern diplomatic practices are a product of the post-Renaissance European state system. Historically, diplomacy meant the conduct of official (usually bilateral) relations between sovereign states. By the 20th century, however, the diplomatic practices pioneered in Europe had been adopted throughout the world, and diplomacy had expanded to cover summit meetings and other international conferences, parliamentary diplomacy, the international activities of supranational and subnational entities, unofficial diplomacy by nongovernmental elements, and the work of international civil servants.[1]

The term diplomacy is derived via French from the ancient Greek diplōma, composed of diplo, meaning "folded in two," and the suffix -ma, meaning "an object." The folded document conferred a privilege—often a permit to travel—on the bearer, and the term came to denote documents through which princes granted such favours. Later it applied to all solemn documents issued by chancelleries, especially those containing agreements between sovereigns. Diplomacy later became identified with international relations, and the direct tie to documents lapsed (except in diplomatics, which is the science of authenticating old official documents). In the

1 Encyclopaedia Britannica, link:https://www.britannica.com/topic/diplomacy, last accessed: 08.08.2020

18th century the French term diplomate ("diplomat" or "diplomatist") came to refer to a person authorized to negotiate on behalf of a state.

Foreign policy is designed to protect the national interests of the state. Modern foreign policy has become quite complex. In the past, foreign policy may have concerned itself primarily with policies solely related to national interest–for example, military power or treaties. A country's foreign policy consists of self-interest strategies chosen by the state to safeguard its national interests and to achieve its own goals through relations with other countries. The approaches are strategically employed to interact with other countries.

In recent times, due to the deepening level of globalization and transnational activities, states also have to interact with non-state actors. The aforementioned interaction is evaluated and monitored in an attempt to maximize benefits of multilateral international cooperation. Since the national interests are paramount, foreign policies are designed by the government through high-level decision making processes. National interest accomplishments can occur as a result of peaceful cooperation with other nations or through exploitation[2].

Foreign policy has general objectives that guide the activities and relationships of one state in its interactions with other states. The development of foreign policy is influenced by domestic considerations, the policies or behaviour of other states, or plans to advance specific geopolitical designs. Leopold von Ranke emphasized the primacy of geography and external threats in shaping foreign policy, but later writers emphasized domestic factors. Diplomacy is the tool of foreign policy, and war, alliances, and international trade may all be manifestations of it[3].

2. The relationship between foreign policy and diplomacy

Diplomacy is often confused with foreign policy, but the terms are not synonymous. Diplomacy is the chief, but is not the only instrument of foreign policy, which is set by political leaders, though diplomats (in addition to military and intelligence officers) may advise them. Foreign policy establishes goals, prescribes strategies, and sets the broad tactics to be used in their accomplishment. It may employ secret agents, subversion, war, or other forms of violence as well as diplomacy to achieve its objectives. Diplomacy is the principal substitute for the use of force or underhanded means in statecraft; it is how comprehensive national power is applied to the peaceful adjustment of differences between states. It may be coercive (i.e., backed by the threat to apply punitive measures or to use force) but is overtly nonviolent. Its primary tools are international dialogue and negotiation, primarily conducted by accredited envoys (a term derived from the French *envoyé*, meaning "one who is sent") and other political leaders. Unlike foreign policy, which generally is enunciated publicly, most diplomacy is conducted in confidence, though both the fact that it is in progress and its results are almost always made public in contemporary international relations[4]. The main objective of foreign policy is to use diplomacy — or talking, meeting, and making agreements — to solve international problems. They try to keep problems from developing into conflicts that require military settlements. The President almost always has the primary responsibility for shaping foreign policy, but President is not the only person responsible. Diplomats are the primary—but far from the only—practitioners of diplomacy. They are specialists in carrying messages and negotiating adjustments in relations and the resolution of quarrels between states and peoples. Their weapons are words, backed by the power of the state or organization they represent. Diplomats help leaders to understand the attitudes and actions of foreigners and to develop strategies and tactics that will shape the behaviour of foreigners, especially foreign governments. The wise use of diplomats is a key to successful foreign policy[5].

3. Modern diplomacy challenges

Traditional diplomacy is practised as the art and craft of communicating and interchanging among states acting through their representatives (diplomats) in the national interest (be it political, economic, scientific, social or other) by peaceful means. These means do not exclude the use of (political or economic) pressure (short of war) which is defined as coercive diplomacy. Raymond Aron already distinguished between "L'art de convaincre" and

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2 Boundless Political Science, "Foreign Policy", link: https://courses.lumenlearning.com/boundless-politicalscience/chapter/foreign-policy/, last accessed: 08.08.2020

3 Encyclopaedia Britannica, "Foreign Policy", link:https://www.britannica.com/topic/foreign-policy, last accessed: 08.08.2020

4 Encyclopaedia Britannica, "Diplomacy", link:https://www.britannica.com/topic/diplomacy, last accessed: 08.08.2020

5 Encyclopaedia Britannica, "Foreign Policy", link:https://www.britannica.com/topic/foreign-policy, last accessed: 08.08.2020

"L'art de contraindre"[6]. The difference between diplomacy and foreign policy is related to that of instruments (of execution) and of formulation and contents of policy. Diplomacy as a method deals with the articulation of foreign policy. It is about the means, not the ends, of foreign policy. Diplomacy thus serves as an instrument of implementing foreign policy. International relations on the other hand is the social science of analysing foreign policy. International relations deal with relations between states, while transnational relations concern transboundary interactions in which at least one societal actor is involved. Diplomacy uses a certain set of skills, tools, procedures, methods, norms and rules as social practises in order to orchestrate and moderate the dialogue between states and thus to optimize the content and quality of international relations, including the management of change[7]. Modern diplomacy requires a variety of skills, in particular, a familiarity with the art of negotiation, an ability to work in a multicultural environment, and openness to co-operation with different actors, in particular, civil society[8]. Modern diplomacy is currently experiencing fundamental changes at an unprecedented rate, which affect the very character of diplomacy as we know it. These changes also affect aspects of domestic and international politics that were once of no great concern to diplomacy. Technical developments, mainly digitization, affect how the work of the diplomat is understood; the number of domestic and international actors whose activity implicates (or is a form of) diplomacy is increasing; the public is more sensitive to foreign policy issues and seeks to influence diplomacy through social media and other platforms; the way exchange between states, as well as the interchange between government and other domestic actors, progresses is influencing diplomacy's ability to act legitimately and effectively; and finally, diplomats themselves do not necessarily need the same attributes as they previously did. These trends, reflecting general societal developments, need to be absorbed by diplomacy as part of state governance.
Ministries of Foreign Affairs, diplomats and governments in general should therefore be proactive in four areas:
1. Diplomats must understand the tension between individual needs and state requirements, and engage with that tension without detriment to the state.
2. Digitization must be employed in such a way that gains in efficiency are not at the expense of efficacy.
3. Forms of mediation should be developed that reconcile the interests of all sides allowing governments to operate as sovereign states, and yet simultaneously use the influence and potential of other actors.
4. New and more open state activities need to be advanced that respond to the ways in which emotionalized publics who wish to participate in governance express themselves[9].

The evolution of diplomacy is analysed from a new and innovative perspective by Professor Richard Langhorne. The key element in his analysis is a concentration on the relationship between the needs and the functioning of the international system. Sometimes, the needs of the international system are met, or even defined, by successful evolution of the diplomatic method, for example, in 1815 and to some extent again in 1919. On the other hand, the emergence of the resident ambassador and the current period could both be mentioned as examples of situations where the needs of the system were not met by diplomatic methods until the need eventually provoked evolution. Current developments in the international system are characterised by the emergence of a much wider range of entities operating in international relations, diffusion of power in the fields of economics and telecommunications, and decline of the sovereignty of states. These changes and challenges need to be met with evolution of diplomatic methods, which we can expect to see in the forthcoming period[10].

The 21st century world will be a very different world from the 20th century world and, much more so, the 19th century world. It is a globalized, interdependent, technology-driven world. Yet the institutions that we are living

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6 Raymond Aron, (1962), Paix et guerre entre les nations, Paris: Calmann-Lévy, p. 68

7 Wilfried Bolewski, "Diplomacy and International Law in Globalized Relations", Part I – Essentials of modern diplomacy, Link: https://link.springer.com/content/pdf/bfm%3A978-3-540-71101-8%2F2%2F1.pdf, last accessed: 08.08.2020

8 DiploFondation, "Modern Diplomacy: A preface". link:https://www.diplomacy.edu/resources/general/modern-diplomacy-preface#:~:text=Modern%20diplomacy%20requires%20a%20variety,%2C%20in%20particular%2C%20civil%20society., last accessed: 08.08.2020

9 German Institute for International and Security Affairs, Stanzel V., "New Realities in Foreign Affairs: Diplomacy in the 21st Century", link: https://www.swp-berlin.org/en/publication/new-realities-in-foreign-affairs-diplomacy-in-the-21st-century/ , last accessed 08.08.2020

10 Academic Training Institute, "Modern diplomacy", link: http://site.iugaza.edu.ps/wmodallal/files/2010/02/Modern_Diplomacy.pdf , last accessed: 08.08.2020

with and the mindset that we have belong to the 20th century. Nationalism was the idea of the 19th century. That is when the concept of nation-states was born. Today, pure nation-states do not exist. They have given way to multi-ethnic states. Earlier, we thought that a state in order to survive has to be viable. But today little state lets smaller than a district in India are recognized as independent states and are members of the United Nations. Other things have changed as well. There are new challenges that face the world today; water, food, energy security, and climate change. While the United States of America remains the leading global power, it is declining in relative terms. There is the rise of Asia: apart from China, there is a much more assertive Japan, as well as Indonesia, Vietnam, and of course, India. Europe, that once dominated the world and initiated world wars, is now pacifist and self-absorbed, focused on trying to make its integration project a success[11].

4. Conclusion

The terms "diplomacy" and "foreign policy" are often confused, but they are not synonymous. Diplomacy is the most important, but is not the only, instrument of foreign policy. Diplomacy as a method deals with the articulation of foreign policy. It is about the means, not the ends, of foreign policy. Diplomacy thus serves as a great instrument of implementing foreign policy. In recent times, due to the deepening level of globalization and transnational activities, states also have to interact with non-state actors. Modern diplomacy, beside the traditional one, requires a variety of skills, in particular, a familiarity with the art of negotiation, an ability to work in a multicultural environment, and openness to co-operation with different actors, in particular, civil society. Modern foreign policy has become quite complex, therefore we could conclude that the modern diplomacy is facing new challenges - technical developments, mainly digitization. Also, according above mentioned we could underline that reflecting general societal developments, there is need to be absorbed by diplomacy as part of state governance.

Current developments in the international system are characterised by the emergence of a much wider range of entities operating in international relations, diffusion of power in the fields of economics and telecommunications, and decline of the sovereignty of states. These changes and challenges need to be met with evolution of diplomatic methods, which we can expect to see in the forthcoming period. In recent times, due to the deepening level of globalization and transnational activities, states also have to interact with non-state actors. The aforementioned interaction is evaluated and monitored in an attempt to maximize benefits of multilateral international cooperation for the states.

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11 Rajiv Sikri, "Challenge and Strategy: Rethinking India's Foreign Policy", In: Indian Foreign Affairs Journal Vol. 9, No. 1, January–March 2014, pp.56-69

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Curatorship at the cultural institutions (Museum) Georgian and International cases.

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Abstract

Art Curatorship is the topic which is widely discussed around the world. The institute of art curator is being established in Georgia. Though, no specific research has been conducted to measure the development aspects and challenges of establishment of the institution.
The objective of the research was to study the historical development and creative value of the institute based on curatorship at the cultural institutions and mainly at the museums. Qualitative research methodology was applied, which enabled in-depth analysis of the information collected. Three specific Georgian museum exhibition cases and number of international cases were appropriate for this work.
The research findings indicate that for the art development and formation museum curatorship plays the leading role. Additionally, curatorship at the museum is discussed in two directions, temporary and permanent expositions, where curatorial approaches have been discussed.
It is concluded, therefore, that the art curatorship at the museum leads to further enhancement of the curatorship at the cultural institutions.

Keywords: Art, Curator, culture, development, Georgia, museum, exhibition

Introduction

The specifics of curatorial activities in different institutions differ according to their directions, mechanisms of functioning, etc. However, the curator of the museum has the most significant role and place for the development and formation of art. This is partly a legacy of Cultural Studies, and an attempt to broaden the notion of 'culture'—once defined by elitist institutions like the museum—to embrace the less exclusive zones of mass media and everyday life. But if mainstream Cultural Studies was content to abandon art history altogether, visual, curatorial and exhibition studies—often driven by people trained in that older tradition—may be seen as more qualified steps away from it.[1]
The museum, characterized by its history of existence, remains a leading art institute. At the same time, its functional orientation changes significantly under the influence of modern processes. The exhibition is the central aspect of museum activities (be it research or conservation, educational or visitor-oriented programs). Over the past half-century, and especially over the last two millennia, museums have come under unprecedented public interest, new galleries and exhibition halls undergoing intensive development trends, followed by new ideas in terms of the visual side of the exhibition and the relationship with visitors.
Traditionally, the activities of the museum are related to three main areas: accumulation (collection), protection (storage) and promotion (representation).
The attitude towards the museum as an institution in the "modern world" is conditioned by certain ideological stamps, which today can be characterized as "old museum science". Old museum studies perceive the museum as a "temple". In 1972, Duncan Cameron wrote that the museum-temple "always has a relevant and universal function: it uses a structured example of reality not only as a reference but also as an objective model with which one can compare one's perceptions." This understanding of the museum has classical roots - such a museum is

[1] This is a pre-publication draft of David Teh, 'Obstacles to Exhibition History: institutions, curatorship and the undead nation-state,' published in Paul O'Neill, Mick Wilson and Lucy Steeds (eds), The Curatorial Conundrum: What to Study? What to Research? What to Practice? (Cambridge MA and London: MIT Press, 2016), 26-38.

more focused on objects than on people. This is also called the "formalist" perspective, which emphasizes the priority of things and their educational potential. The museum is seen as a place where the treasures of the past are preserved and awe the uniqueness of items of great cultural importance.
In addition, old museum studies are associated with an elitist and passive approach to the museum that does not actually motivate visitors to take action and participate. It is related to traditional ideas and narrow perceptions of history. It is based on more empirical, rather than professional, standards and is not perceived as an academic discipline. As a result, the museum remains a conservative and static institution, unable to accept new ideas, where no change can take place, and which is linked to old theories, and these theories cannot pave the way for the museum to a new reality.
After the 1980s, the so-called "postmodernist" era, new theories of museology emerged. These theories are still relevant today and form the basis of dialogue in the museum world. "New Museology" P. Vergo[2] very accurately described it as "a large-scale dissatisfaction with the traditional perception of the museum (what he calls" old museology") and the need to establish new museology based on a radical revision of the role of museums in society." Contrary to the idea that old museology is "the search for origins, the tradition of searching for similarities, and the collection of images and perceptions of the past by people who are interested in it."
The new museology can be considered as "new tendency to critical thinking and approach, becoming as a basis for debates and opposed the existing unanimity." In addition, the new museum is more focused on people than things. According to the new, "analytical" perspective, museums try to spread knowledge not only about what happened but also about how and why it happened, attitudes towards things changed and it became interesting to study their essence and not only their structure. This idea promotes discussions and the active role of the museum, highlighting its educational role along with various entertaining aspects. In other words, instead of arrogant temples, museums become places where a wider cultural life takes its place. Democratization and accessibility are becoming a reality and civilization is widely represented.
The scope and development of conceptual roots over time can be illustrated
chronologically (Figure 1)
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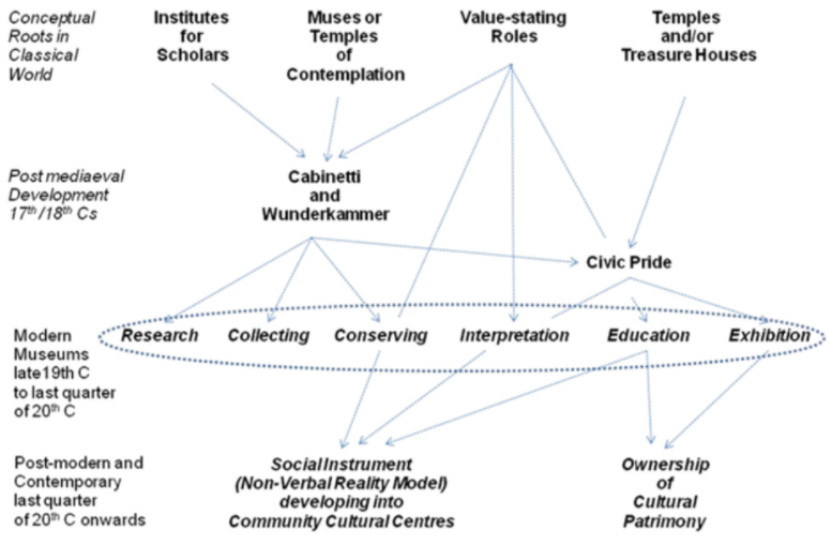

Figure 1: Accumulated social purpose[3]

An independent curator appears as an organizer of temporary exhibitions in cultural institutions such as a museum, gallery, or any other exhibition space not as an official employee. This was since in the 1960s and 1970s, institutional frameworks for the presentation of art dictated certain approaches, which prevented curators

[2] https://www.scribd.com/doc/33632033/New-Museology-edited-by-Peter-Vergo
[3]ttps://www.researchgate.net/publication/241735955_The_conceptual_roots_of_modern_museum_management_dilemmas

with an innovative approach. Specific institutional frameworks have hindered new-minded curators, who have begun to break the rules and implement interesting projects, even if it is against the museum's program.
The main credo of their work was "Independence and Radicalism" for Jean-Yuber Marten, the notion of "independent curator" associated with "independent, free-thinking".

SPECIFICS OF MUSEUM EXHIBITIONS

Exhibitions, especially in recent years, have dominated the perception of visitors so much that they have almost ruled out all other forms of museum life. The great blockbusters in the field of art history, the archaeological discoveries of some major civilizations, were at the forefront of the museum exhibition space, but there were also new exhibitions dedicated to science that revolutionized natural history museums and science centres. In museums, relatively small exhibitions have contributed to the dominance of exhibition culture, such as exhibitions based on the scientific presentation of all aspects of a single image in the National Gallery in London, as well as ethnographic exhibitions organized directly in collaboration with ethnic groups.
It should be noted that the museum is not a theatre and the exhibition does not play the same role it does for a play at the theatre. The museum has other purposes and functions that may even be a priority for the people, especially professional staff and curators. These are the functions; **Collecting:** Purchasing works of art, artefacts, or various objects is a difficult task in itself, as from different points of view (not only for professionals but also for visitors or even the future generation), it is a criterion for evaluating the work of the curator and the director. **Conservation:** Unlike the theatre, which still serves the ephemeral, the museum is dedicated to the preservation of material and spiritual cultural heritage. That is why conservation, collection management and their safety is a vital activity for the museum, which is rightly regarded as its long-term top priority. **Research**: Collections and even exhibitions in any museum are only as valuable as there is documented knowledge about it. Thus, the research with regard to the collection, conservation and exhibition of the collections, is rightly regarded as the cornerstone of all museum activities. A feature that should be preferred over exhibitions.
All three functions remain historically a priority at all stages of the development of museums. Here we have to touch on some forms of exhibition. It goes without saying that the static arrangement of the exhibition for permanent collections (which characterized many museum exhibition halls in the late nineteenth and early twentieth centuries and still characterizes some) is at best the minimal essence of the "exhibition" function.
Exhibitions, especially in recent years, have dominated the perception of visitors so much that they have almost ruled out all other forms of museum life.[4]
There was not and still is not a unified, organized system of exhibitions in museums (like a theatre organized around the staging of a play). It is understood that the curators organize, or at least give incentive and direction to, the arrangement of the exhibition. This is still the case in many museums today. But the problems that accompany curatorial work come to the fore in particular: Curators are responsible for purchasing and researching collections. In many cases, they prefer to focus on these features and attribute only the secondary role to the exhibition program.

MUSEUM CURATOR (International and Georgian cases)

With the development of contemporary art and the shift in the job of the contemporary curator, a new phenomenon called New Museology enters the scene. It focused on the visitor and elevated its status, a move that influenced and made a large impact on the role of the curator in a museum.
The involvement of the curator in organizing a permanent exhibition is very important. Constant updating, rearranging, and changing exhibits help expose the content and thus create an overall picture of art development. At the same time, the curator can influence other means of more creative perception of the permanent exhibition. The curator can and should find the grains that will modernize and revitalize the exposition.

For example, we can see the involvement of the curators at the Tate Modern Gallery in London; they decided to involve the musicians in the exhibition process and organized an exhibition accompanied by music. The Chemical Brothers band, for example, featured a sculpture by Jacob Epstein (1880–1959) called Rock Drill; "We chose to write music for The Rock Drill as it seemed so dynamic, powerful and modern - it just seemed so techno - we could imagine music as soon as we saw it," the Chemical Brothers told the BBC. "The sculpture has a feeling of movement. We wanted to capture the latent feeling of force that the figure has. Having heard music in art galleries before that is largely ambient, we wanted to make something rhythmic and structured that connected to the piece." [5]

[4] THE MANUAL OF MUSEUM EXHIBITIONS EDITED BY BARRY LORD and GAIL DEXTER LORD, page: 13-18
[5] https://www.residentadvisor.net/news/8152

The band Vavavoom musically arranged Andy Warhol's installation called Brillo. As a result of this synthesis of art and music, a new semantic space was created, where the exhibits acquired audiovisual content. A similar approach was introduced at the Hermitage in 2005 under the name Caravaggio and the Hermitage. Exhibition and installation with different flavors, where the viewer could perfectly immerse in the picture, not only semantically, but also in a sensual sense - to feel the scent of fruits and flowers depicted on the canvas.[6]

Naturally, the curator of a permanent exhibition is directly merged to the museum collection and can act as the creator/compiler of the collection. The curator knows all his strengths and weaknesses, which enables to contribute to the perfection of the collection. In this regard, the curator often determines the policy for the purchase of museum works and indicates the priority areas. In this case, the activities of the curator are directly related to the activities of the director of the museum. If in such a tandem there is a true visionary curator and an alliance of open-minded, sensible director who can devise the right strategy for creating a collection, it will predetermine the museum's reputation, affirmation and enhancement on the world art scene.

The activities of the temporary exhibition curator differ from the principles of organizing a permanent exhibition. The exhibition, in addition to general cultural significance, is a mean of self-expression, which is largely the presentation of a subjective view and the use of all means of expression. Therefore, the temporary exposition each time is the curator's subjective vision, which is a certain, rebus, puzzle to be guessed at. The museum curator is distinguished by the ability to organize exhibitions that focus on different historical segments with the available material. Historical retrospective exhibitions are another opportunity to present the museum collection to the audience and, at the same time, an essential element of the museum's educational and research activities. Thus, this is one of the most important directions in the activities of temporary exhibition curators, despite the "routine" of the exhibited rarities and the low interest of non-professional groups of visitors. In any case, the main basis of the exhibition is the original intention of the artist and the peculiarities of the epoch. At the same time, the curator is also trying to use a whole set of exposition strategies. Presentation of twentieth-century art requires a special approach; here the full potential of the curator is revealed. In addition, focusing on topicality and innovation is most interesting for the curator.

One that had the courage and the inspiration to create the first exhibition that broke out of the usual rules, "When Attitudes become Form" becoming a revolutionary event in the art world. The Swiss curator put on this show where he offered artists freedom to exhibit how and where they want, going out of the walls of the gallery, and at the same time having a clear idea in his mind of what should be displayed and how it was going to happen. He was the first curator that also took on the role of artist, opening the world to the idea of exhibition as a place of feeling and meditation through the objects of art. He threw out convention out of the window, and continued doing so with all his work that followed, putting on the base for grand exhibitions that are the norm today, creating the independent curator, offering it artistic and creative attributes and opening up a new world for exhibiting art.

It is especially noteworthy to arrange exhibitions of contemporary art in the space of traditional museums, the spaces of which are not ready for exhibitions. Consequently, it is particularly stimulating for curators to create a new associative field. At first glance, it is simple, but in fact no less, and perhaps even more difficult because of its status, to organize exhibitions directly in the museums of modern exhibitions.

One of the most important and interesting curatorial exhibitions is the project called "AN in the present must be transformed"[7], which was held in 2007 at the Peggy Guggenheim Museum. The exhibition was curated by Nancy Spector, curator of the Solomon Guggenheim Museum in New York. The exhibition examined affinities between the two artists who, though separated by generation and geography, share aesthetic and conceptual convictions. The exhibition focused on the metaphoric use of materials, metamorphosis, and the relationship between action and its documentation in their respective practices. It also revealed philosophical differences between Matthew Barney and Joseph Beuys that, in turn, further enhanced our understanding of each artist's work.[8] The main "exhibit" of the exhibition is a specially printed catalogue consisting of illustrations and analytical articles, where the curator and three well-known contemporary art scholars (Mark Taylor, Chris Scheidman and Net Trottman) talk about the work of two (Matthew Barney and Joseph Beuys) artists.

It also important to name exhibitions with a special idea/concept that characterize the curators of modern museums. An exhibition called Rakastaa, ei rakasta ... "("love me or leave me "), held from April 3, 2004 to February 27, 2005, at the Museum of Contemporary Art Kiasma, Finland.

Already the name of the exhibition itself indicated that there would be no admiration for the traditional exhibits and classic aesthetics. From the beginning, the focus was on active interaction with the audience. The exhibition

[6] http://www.museum.ru/N24277

[7] https://www.e-flux.com/announcements/40817/all-in-the-present-must-be-transformed-matthew-barney-and-joseph-beuys/

[8] https://www.guggenheim-venice.it/en/whats-on/exhibitions/all-in-the-present-must-be-transformed-matthew-barney-and-joseph-beuys/

included a huge number of installations, which meant a choice. According to the idea of the curators, the viewer who likes this or that installation can show their interactivity towards it. Or in case of dissatisfaction with the presented work - just skip the page for the exhibit. The main focus of the exhibition is not on the coherent, "correct" perception of the works, but on the unexpected contact that affects all types of sensory approach - sight, hearing, smell, touch, taste - and the development of the exhibition's pure personal impression, personal message.[9]
The curators also suggest the use of artefacts preserved in the museum when creating the contemporary exposition. For example, Teona Japaridze's (Georgia) project entitled "The dog barks, the caravan goes" at Tbilisi History Museum. Since the building of Tbilisi History Museum was a caravanserai in the 19th century, the curator linked the project to the Silk Road, because due to its old function and the phenomenon of marketplace (bazaar) in general, the caravanserai is a small mock-up model of integration, ties with the external world, trade in everyday stuffs, exchange of information, encounter of cultures and religions, and, ultimately, globalisation.
The idea of the project was to stop time and place in the exhibition hall the energy and information that crossed small countries when following great historical and geopolitical thoroughfares, keeping the countries dynamic.
The curator used items kept in Georgian National Museum to visualise the process. (figure 2) These were everyday stuff imported from the east along caravan tracks or from the west by rail and luxury items. Video and audio installations for the project were made together with artists involved in the project on the basis of materials found in the photo archives of the museum, Globalization, wars and love. The curator mentions in the interview that her experiment was to "integrate museum exhibits with the modern exhibition space and bring them to life in contemporary art."[10]

(Figure 2)

A miniature painting from a manuscript of *Yusuf and Zulaikha* (Iran, 19th century, paper, watercolour. the oriental department of the Georgian National Museum).

It should also be noted that the curator, and especially the curator of the museum, with the great historical material, also acts as a researcher. Consequently, it sometimes offers not only a good exhibition but also an exhibition-discovery. I would like to mention Curatorial Exhibition, 'Red Terror and Georgian Artists at the Georgian National Museum. The project included three stages: a "scientific" research, an exhibition reflecting the Soviet occupation and the publication.
The exhibition Red Terror and Georgian Artists represents the creativity of the repressed artists and the general atmosphere of 1930-40s Georgian art. "The exhibition incorporates two parts. The first focuses on five artists that experienced the worst pressure and were shot," Eka Kiknadze, the head of the National Gallery and organizer of the project, told: "The works of Dimitri Shevardnadze, Petre Otskheli, Vakhtang Kotetishvili, Richard Sommer and Henryk Hryniewski are being exhibited on the first floor. The second part of the display is devoted to Georgian artists of the 1920s-1940s. Through these works, we aim to show how the Soviet regime and its ideology influenced art. The exhibition clearly shows the transformation of the artists, how they worked before and after the severe repressions. The Red Terror was especially painful for the artists who worked in the 1910s and so were able to experience Georgia as an independent country with easy access to Europe until they were separated from it by the Iron Curtain. When the Bolsheviks came to power, the artists were given the order to portray the Soviet regime in a good way, and therefore, they were restricted from freely expressing themselves in their artworks. They were forced to lie and create an illusion of the cruel reality," she added. One highlight of the exhibition is that visitors will be able to discover sculptor Vakhtang Kotetishvili. "He is known to society as a splendid writer, but he is less known as a sculptor," Kiknadze told us. "His wooden statue of a man on his knees represents a

[9] http://nomi.spb.ru/img/pdf/2004_39.pdf
[10] https://www.youtube.com/watch?v=bBzmcZcz5L0

symbol of that epoch and people persecuted and oppressed by the totalitarian rule. We chose his sculpture as the main hero of the exhibition since whereas all the artists in the 1930s were ordered to paint happy Soviet citizens and countries, Kotetishvili dared to carve a statue of a man on his knees, demonstrating a devastated and unhappy man living in the Soviet Union."

All five artists presented on the first floor are exceptional personalities who contributed to Georgian culture. Dimitri Shevardnadze is the founder of the National Gallery of Georgia, having himself collected almost all the artworks by Niko Pirosmanashvili (Pirosmani). He also actively took part in establishing the Tbilisi Academy of Arts with Henryk Hryniewski. Shevardnadze also founded a program of museum management in Georgia and was both initiator and participant of the cultural life of Georgia in the 1920-30s.
Yet another victim and important personality whose bold and cutting-edge artworks are presented at the venue is Petre Otskheli, recognized as a modernist and one of the most progressive artists of his time, not only in Georgia but internationally.
"The second part of the display showcases how artists were influenced by the totalitarian regime and show the contrast between their paintings, before the occupation and after it. This can be clearly seen in famous Georgian artist Elene Akhvlediani's two works, the first painted in the 1920s in a free manner, where the artist's style and signature is visible, while the second artwork, named 'Abastumi Resort' was made in 1940 on order," Kiknadze said. "At that time, Soviet censorship approved and supported only naturalist paintings. At the venue, one can see examples of Soviet censorship and the artworks that were criticized or prohibited due to their distinctiveness. At the time, jury members instead of art critiques, representatives of the Communist Workers' Party, evaluated the paintings not from an artistic or aesthetic point of view but based on how it coincided with Soviet ideology.".
It should be noted that the exhibition was followed by curatorial tours, artistic talks and various educational programs.

Summary/Conclusion

The Curator of the exhibition provides information, connections, and even contrasts to understand what makes art relevant today, and not only reflects meaning but contribute to debates and new understandings. The curator is, more and more, an auteur who experiments with different formats, different ways of experiencing the art, and creating different meanings. Like an artist, the contemporary curator tests old formats and invents new ones.
In general, the activities of a museum curator can be considered in two directions: the first is the curator of temporary and permanent exposition. It views its activities through the prism of the institution it represents. The curator thoroughly studies all the features and characteristics of the collection preserved in the museum, in addition he/she fully appreciates the specifics of the museum halls and has the best analyzed planned curatorial exposition, at the same time does not violate the museum policy. Thus, the curator of the museum acts as a researcher and exhibitor as the main practitioner of organizing the artistic process of the museum.
On the second level is the director of the museum, who is the lead curator of this institution. The museum is not only an institution for the director but also an art project, which is especially visible when he/she is the founder of the museum. (For example, the most important achievement of Walter "Chico" Hopps was the formation of the Menil Collection. It was this collection that laid to the establishment of the foundation and later the museum, of which he became director in 1973). The director of the museum combines two functions: administrative and creative. Creative means involving the museum in the exhibition policy, creating a team of curators and defining the development strategy of the museum, which involves the representation of this institution in international cultural projects. As scholars, Barry Lorde and Dexter Lorde put it, "the management of the museum is intended to facilitate decisions that will justify the purpose of the museum, the implementation of its mandate, and the achievement of its goals and objectives for all functions of the museum."
Thus, while the curator, in the traditional sense, is responsible for solving specific issues, the director tries to solve general tasks, leading to an integral tandem of "director-curator" as each serves to a mutual goal - to create a holistic and comprehensive institution called a museum.

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The Greek alphabet: charting its evolution by analysing ancient Greek inscriptions

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Abstract

The ability to read and write has always been recognised as one of the highest achievements of human civilization. The oldest evidence of writing in Greece are from Crete and are dated to the middle of the Bronze Age. Crete, which held a dominant position in the Mediterranean area, was the cradle of a great civilisation known as the Minoans. This paper seeks to discuss the evolution of the Greek alphabet and Greek writing, to present three pre-alphabetical writing systems, developed in Crete (Hieroglyphic writing, Linear A and Linear B) and to provide an overview of this evolution by introducing the most important example of hieroglyphic writing, the Phaistos Disc dated to 1700 BCE, plates of Linear A and B from the Cretan palaces of Phaistos, Knossos and Pylos, as well as Greek inscriptions of the 8th century BCE engraved upon vessels (skyphos of Pithecusae, oinochoe of Dipylos) and the inscription of Nikandre. These representative surviving specimens of the Greek writing evolution state that the completion of the writing system followed a long procedure of developments and adjustments to the features and needs of the ancient Greek societies.

Keywords*:* Greek alphabet, evolution, pre-alphabetical writing systems, inscriptions

Introduction

The ability to read and write has always been recognised as one of the primary achievements of human culture. The oldest examples of writing in Greece are from Crete and date back to the Middle Bronze Age. At that time, Crete held a dominant position in the Mediterranean and through trading it came into contact with countries that created great civilizations during antiquity. Furthermore, Crete itself was the cradle of the Minoan civilization. During the second millennium BC three pre-alphabetical writing systems were developed on the island, named conventionally by the famous archaeologist Arthur Evans who participated in excavations on Crete, as the following***: Hieroglyphic, Linear A and Linear B.*** (Zopidakis, 1999:360)

The birth of writing in ancient Greece: the pre- alphabetical writing systems

The first examples of Minoan writing were found on seal stone ideograms. It was named by Evans, Hieroglyphic writing, due to an alleged similarity to the Egyptian hieroglyphics. It is an iconographic writing system, meaning it uses figurative symbols of the same value as the ideograms. (Hooker, 1996:37) Testimonies of this writing were found at Knossos, Malia, Zakros and elsewhere in Crete and from the date of the archaeological findings we assume that it was in use during the period 2000 - 1700 BC. (Zopidakis, 1999:360) However, seals have been discovered (seal-stones imprinted on clay) with pictorial symbols side by side with linear symbols, at the end of this period. They probably belong to a transition stage between the Hieroglyphic and the Linear A writing system. (Robinson, 2007:110)

Iconographical symbols thus coexisted with the linear system and gradually the simplified linear points replaced the pictorial symbols. Figurative writing was then substituted for a more elegant and systematic way of writing, Linear A, which was found mainly on 150 small clay plates from the area of Agia Triada (near Phaistos) and referred to transactions and storage. It was in use in the Minoan urban centres from approximately 1800 to 1450 BC. (Polatof, 2001:70) Ceramists engraved the inscriptions in a right-handed writing, with 90 syllabic letters. In conjunction with the ideograms a decimal enumeration system was used, as is evident on signs with accounting content. While the so-called Linear A was registered as the local language of Crete its meaning still remains unknown, because no one has been able so far to decode it. From Crete its use spread to several Aegean islands and the mainland. (Zopidakis, 1999:360)

An adaptation of Linear A, called the Cypro-Minoan writing system, was used in Cyprus between 1600 and 1100 BC. (Hristidis, 2005:83) This system has also not been deciphered, so we have knowledge of the types of syllabic letters, but we cannot appreciate their vocal value. (Polatof, 2001:78)

Linear B (or the "double writing system") evolved from Linear A, probably as a result of the need for an adjustment of the previous writing to the demands of the Greek language. (Hristidis, 2005:71) However, this evolution is uncertain, because since the structure of Linear A remains unknown it is only possible to speculate why a new writing system was required.

The adaptation of the new writing system may have been completed during the 15th century BC at Knossos, because more than 3000 samples were found there. Yet it was not until many centuries later that the Greek language would be registered for the first time. This happened around the middle of the second pre-Christian millennium with a syllabic writing system, named by modern scholars as Linear B. After the destruction of Knossos, this writing system spread to the mainland of Greece, as proven by the 1500 inscriptions found in Tiryns, Pylos, Eleusis, Mycenae and elsewhere. These clay plates are dated to circa 1200 BC. Like its antecedent Linear A, Linear B is written from left to right (clockwise). (Hooker, 1996:87). It contains 90 syllabic letters and a decimal system. The alphabet of Linear B had five vowels (a, e, o, i, u) which were combined with the consonants (g, w, r, m, n, p, t, d, k, q, s, z). The general opinion of scholars is that it is an imperfect system of writing, invented to express a non-Greek language. We presume that very few people knew how to read the system and even fewer knew how to write it. It was a system that owed its existence to the accounting needs of the administration of the Mycenaean palaces. In any case the contribution of the indications of Linear B is invaluable not only for the evolution of Greek writing and language, but also for a variety of issues such as governance, place names, professions, and the worship of gods. (Zopidakis, 1999:362-363)

Alphabetical writing

Alphabetic writing is the culmination of a long series of efforts to gradually improve and adapt writing to the demands of the expression of thoughts and ideas of the ancient Greeks, while fixing points with the greatest response to the sounds of the language. Many scholars attribute the authorship of the Greek alphabet to the Phoenicians. However, if we acknowledge that the alphabet is really of Phoenician origins, it's reasonable to assume that the Greeks borrowed this writing system for reasons related to trade, since the relationship they shared with the Phoenicians was mainly commercial. Even if we accept that the paternity of the alphabet belongs to the Phoenicians, it is the ancient Greeks who were responsible for its completion. (Zopidakis, 1999:365) The Greeks may have adopted the new system of writing between the 11th and 9th centuries BC, having applied fundamental changes to adapt it to their language. (Robinson, 2007:167) They maintained the five vowels that we find in Linear B. Although Linear B had marks for simple vowels, especially when they were at the beginning of a word, the new system, which was based on the principle of "one sound - one letter", completely ignored the old symbols of Linear B. In 1952, the historian Ignace Gelb[1] argued that the ancient Greek alphabet perhaps uses Phoenician characters, but that Greek is the first true alphabet (as defined by each letter equalling one sound), while the Phoenician and other alphabets, which preceded it, were "*syllavaria*" in which each character represents a specific combination of accord-vowel, forming a syllable. (Hooker, 1996:97) The Greeks took the Phoenician alphabet and made a few key changes. The Greek vowel letters A (alpha), E (epsilon), I (iota), O (omicron), Y (upsilon) and H (eta), came into being as adaptations of Phoenician letters for consonant sounds that were absent in the Greek language. By using individual symbols to represent vowels and consonants, the Greeks created a writing system that could, for the first time, represent speech in an unambiguous manner.[2]

By the 7th century BC, all Greek city-states had already developed and used the alphabet, each one applying its local characteristics. The full Greek alphabet originally had 26 or 27 letters (while the Phoenician consisted of 22 symbols[3]). No Greek city, however, seemed to use them all. Every city used those letters that were required according to its dialect. Only five of the letters of the alphabet were wholly invented by the Greeks: the two vowels υ (ypsilon) and ω (omega) and the consonants φ, χ and ψ. The other 22 - their characters and names – were derived from the north-Semitic writing system (including the *digamma*).

The domestic alphabets remained in use until the late fifth century BC. From then on, the Ionic alphabet - in fact, the alphabet of Miletus, one of the greatest cultural and intellectual centres at that time - gradually dominated. [4] The Greek alphabet was the basis for the formation of the Latin alphabet. Indeed, the Latin alphabet

[1] Gelb I., (1952). *A study of writing: the foundations of grammatology*, University of Chicago Press.
[2] Greek alphabet, Ancient History Encyclopedia, https://www.ancient.eu/Greek_Alphabet/
[3] Writing and Music, Museum of Cycladic Art, https://cycladic.gr/page/grafi-mousiki
[4] Ibid

is derived mainly from the Etruscan alphabet, which according to the most prevalent theory is based on the Greek one.

The advantages of alphabetical writing systems are illustrated by their high degree of versatility, economical nature (they include a small number of symbols), their completeness (they allow the possibility of an easily written impression of any word) and to the clarity and precision they can provide to written texts (each word is comprehended easily and uniquely). These advantages enabled every person, from childhood onwards, to have the ability to read and write, a fact which had a major impact on the widespread use of writing and the evolution of culture. Current alphabetic writing systems only differ from the original Greek one in their use of lower-case letters and punctuation. Punctuation had begun to be used before 500 BC, but its usage was systematically introduced by Aristophanes the Byzantius (circa 257-180 BC), along with the marks of points and spirits. (Mioni, 1998: 57-58)

Fig. 1 Clay- vessel decorated with letters from the ancient Greek alphabet, National Archaeological Museum, Athens (**shorturl.at/zKLT3**)

The development of writing through archaeological findings

a) The Phaistos Disc (fig. 2)

The most important example of the hieroglyphic writing system is the disc of Phaistos, made of clay, which is exhibited at the Archaeological Museum of Heraklion (Crete) and was found in 1908, during excavations in a 17th century BC layer of the ruins of the old Minoan palace of Phaistos. Its precise date is not possible to be determined but it is believed to belong to the Middle-Minoan IIB period. The contents of the disc are an anomaly when compared to the basic linear and pictorial traditions of Minoan Crete. Nevertheless, its Cretan origin cannot be denied because in 1935 a double axe "*pelekis*", which has fifteen engraved symbols with obvious similarities to the symbols of the Phaistos disc, was discovered in excavations at Arkalohori (Crete) (Robinson, 2007:111). The dimensions of the disc range from 15.8 to 16.5cm in diameter and 1.6 to 2.1cm in thickness, the variations in size suggest that it was handmade. [5]The mysterious inscriptions on both sides of the disc consists of 242 ideograms of 45 different types of figurative symbols (according to some scholars there are 246 symbols), 122 on side A and 119 on side B, imprinted in a spiral order. (Zopidakis, 1999: 360) These 45 types were imprinted on the clay and then the disc was fired. The impressive technique used to make the disc, where for each ideogram a seal was used,

[5] Phaistos Disc, ENCYCLOPEDIA OF ANCIENT GREEK LANGUAGE AND LINGUISTICS, Volume 3P–Z, Index https://www.researchgate.net/publication/266209262_Phaistos_Disc

could be regarded as a forerunner of the printing press.[6] This ideographic script, probably syllabic, whose text (language), despite the numerous efforts made to decode and measure the *ideograms* by many different methods, remains still unknown. The disc has spurred the imagination of many archaeologists, professional and otherwise, who have made several attempts to decode its enigmatic content. [7]Among the interpretations that have been proposed are its relation to a prayer, a hymn the narration of a story, a geometric theorem and a calendar, among others. Nevertheless, so far, the scientific community has not officially accepted any of the proposed decodings and the content of the disc remains an unsolved mystery.

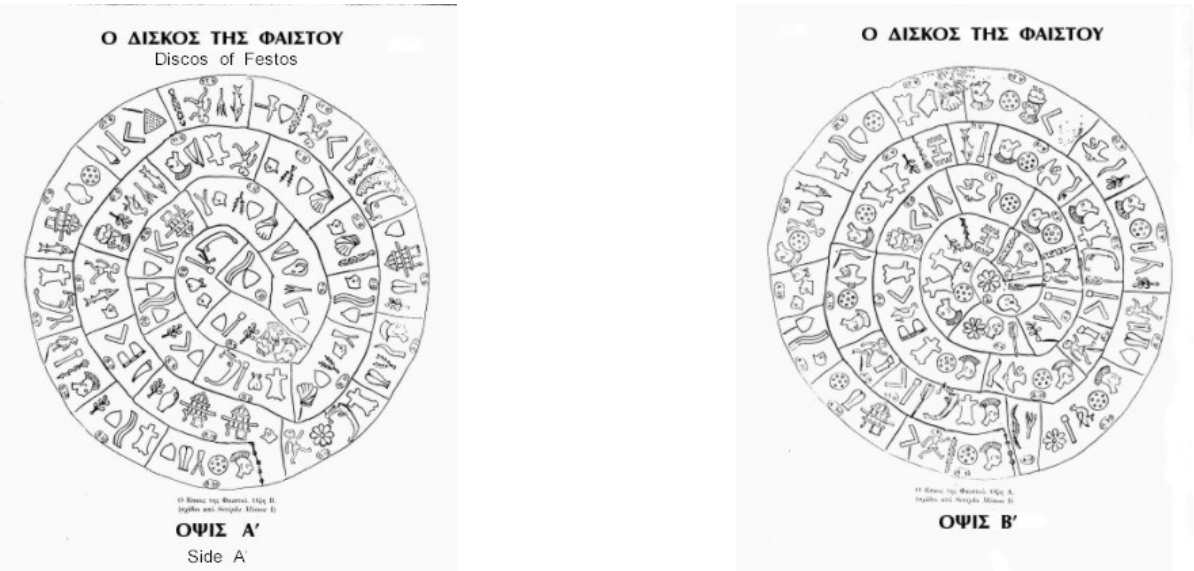

Fig. 2 The Faistos Disc
http://users.uoi.gr/gramisar/prosopiko/vlaxopoulos/ergasies_2hxilietia/Kali_o_diskos_tis_faistou.pdf

b) The ancient Greek inscriptions

The content of early inscriptions, including names and simple expressions either for moments of private entertainment involving dancing and drinking, or regarding religious issues, contrasts the new alphabetic writing with Linear B, which, as we have seen, was mainly used by the royal scribes for the official records of the palace (Polatof,2001: 102) and occasionally by technicians to communicate with each other in a very limited circle. The archaic inscriptions are characterised by their simplicity and showing a disregard for the form and the symmetrical and elaborate design of the letters, representing perhaps an "*immature and childish*" phase of Greek writing, or simply because they are produced by ordinary people who were not professional scribes. The inscriptions are written from right to left, in ancient Greek "*επί τα λαιά" (epi ta laia)* or otherwise "*βουστροφηδόν"* (*boustrophedon*, meaning the course of the oxen while plowing).[8] The oldest known Greek inscriptions, dating

[6] The Faistos Disc, Archaeological Museum of Heraklion, http://odysseus.culture.gr/h/4/gh430.jsp?obj_id=7881

[7] Phaistos Disc, ENCYCLOPEDIA OF ANCIENT GREEK LANGUAGE AND LINGUISTICS, Volume 3P–Z, Index https://www.researchgate.net/publication/266209262_Phaistos_Disc

[8] Writing and Music, Museum of Cycladic Art, https://cycladic.gr/page/grafi-mousiki

back to the middle of the 8th century BCE, are mostly imprinted upon pots. Among them are the ***Oinochoe of Dipylon*** (a kind of jug used to pour wine into cups), the ***Skyphos of Pithekoussai*** (Iscia-Italy) and the ***Inscription of Nikandre***.

1. The Dipylon Oinochoe

It is by far the oldest known specimen of alphabetic writing in the ancient Greek world, engraved on a geometric style vessel, dated to the third quarter of the eighth century BC at approximately 740 BC. (fig. 3) The inscription includes some Phoenician characters, so therefore it seems that at this period the alphabet had not yet been completed. On the jug is written, from right to left, the inscription:
ΝΙΜΝΑΚΕΔΟΤΟΤΙΕΖΙΑΠΑΤΑΤΟΛΑΤΑΝΟΤΝΑΙΠΝΟΤΣΕΧΡΟΝΥΝΣΟΗ and from left to right:
ΗΟΣ ΝΥΝ ΟΡΧΕΣΤΟΝ ΠΑΝΤΟΝ ΑΤΑΛΟΤΑΤΑ ΠΑΙΖΕΙ ΤΟΤΟ ΔΕΚΑΝ ΜΙΝ (fig. 3-4), meaning "Whoever from the dancers is dancing now more lightly" ... The rest is illegible, but it is likely that it said "will take the prize", meaning the vessel. The inscription on the Oinochoe of Dipylon probably indicated the prize of an orchestral contest, as it is evidenced by the one verse metrical inscription engraved "*epi ta laia*".
(Hristidis, 2005:104)

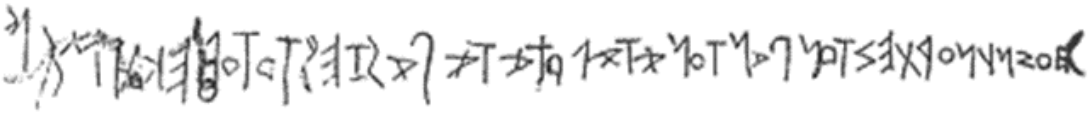

Fig. 3 The inscription on the Dipylon Oinochoe (Hristidis, 2005:104)

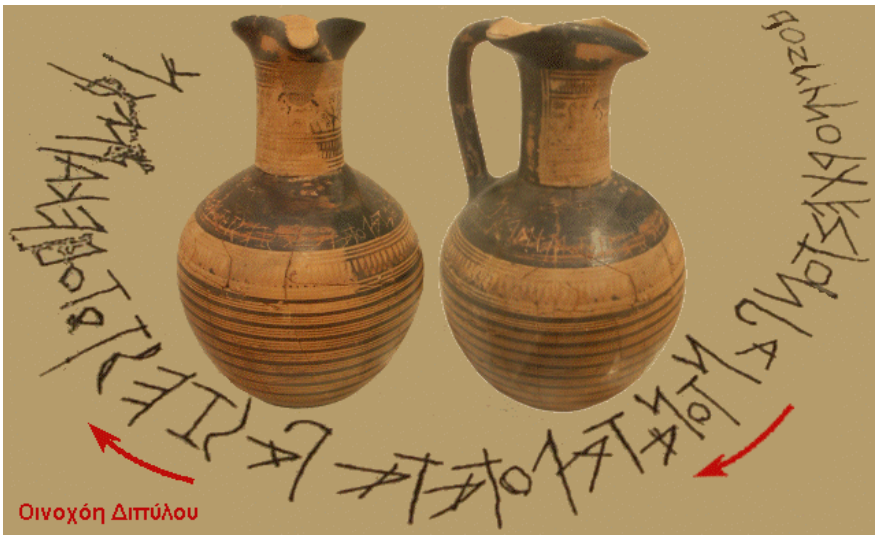

Fig. 4 The Dipylon Oinochoe https://www.timetoast.com/timelines/arxaia

2. Skyphos of Pithekoussai (Iscia-Italy)

Another vessel of the same period is the Skyphos of Pithekoussai - also known as the cup of Nestor – which was excavated in 1954 at the Euboean colony Pithekoussai (now Ischia in Italy) in the Adriatic. It is a green proto-Corinthian style drinking cup with two handles and a footed base, dated to the late 8th century BC and discovered in a tomb. The engraved inscription on the skyphos bears a triple metrical verse inscription, with "halkidic " - Eubeoan characters, also engraved from right to left. (Zopidakis, 1999:366)
Upon it is written (fig. 5) "I am the mellow cup of Nestor. Whoever drinks from this cup, will immediately be captured by the desire of Venus with the beautiful crown". This is probably the oldest Greek inscription ever found in the West.

Fig. 5 The inscription on the "cup of Nestor" - Skyphos of Pithekoussai (Hristidis, 2005:103)

3. The Nikandre Inscription (fig. 6-7)

Of the significant inscriptions of the subsequent century (7th BCE) we can mention the type of "talking object" inscription of Nikandre from the Aegean island of Delos. The inscription also refers to the name of Nikandre, its dedicator, and is engraved on the left thigh of an early Greek female figure, dedicated to the Goddess Artemis, running a course from left to right and right to left. It consists of three *dactylic hexameters* in the archaic alphabet of the Ionic dialect.[9] The inscription in continuous writing is the following: "Nikandre daughter of Deinodikos the Naxian outstanding amongst women, sister of Deinomenes and now wife of Phraxos, dedicated me to the far-shooting archeress".

[9] Kore of Nikandre, Museum of Classical Archaeology Databases. University of Cambridge, https://museum.classics.cam.ac.uk/collections/casts/kore-nikandre
The goddess honored with this gift is not named, but is described as being an accurate long-distance archer — it can only be Artemis.The first line of the inscription is written left to right, the second right to left (boustrophedon)

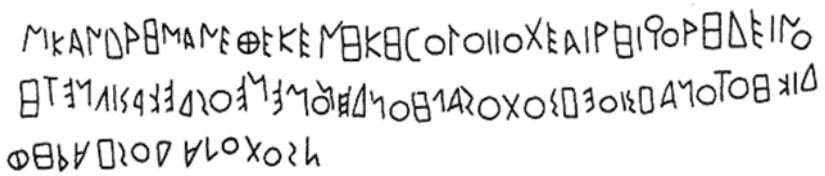

Fig. 6 Kore of Nikandre
National Archaeological Museum
(Athens)

Fig. 7 The Nikandre Inscription
https://www.researchgate.net/figure/Nikandre-inscription-6-th-century-b- c_fig1_2417759

Conclusion

The development and completion of the writing system followed a long procedure of developments and adjustments to the features and needs of the ancient Greek societies, as seen from the selected examples of inscriptions on the archaeological findings listed above. The use of figurative ideograms - Hieroglyphic Minoan script – was followed by a transition period where the syllabic writing system was used by introducing linear symbols (Linear A and B) which resulted in an alphabetic writing system that contributed to the proliferation of the use of writing and the development of civilisation.

The mysterious writing with figurative symbols, which was used to imprint a prayer, a calendar, to tell a story, or to express a geometric theorem, gave way to a linear system aimed at an intellectual "elite" – such as royal scribes who used the writing system in order to serve the accounting needs of the Mycenaean palaces. The next milestone in the development of writing was the alphabetic system. Until its introduction writing had limited and selective use, but with the advent of the alphabetic system writing could be used to express every aspect of human activity, from administration to private moments and commercial transactions to cult events. It is obvious that the archaeological inscriptions that were selected are not unique, but they are some of the most representative surviving specimens of the Greek writing evolution.

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