UNIVERSITETI I EVROPËS JUGLINDORE
УНИВЕРЗИТЕТ НА ЈУГОИСТОЧНА ЕВРОПА
SOUTH EAST EUROPEAN UNIVERSITY

POSTGRADUATE STUDIES – SECOND CYCLE

THESIS:

"Factors That Influence EMIS Post-Adoption in the Context of Republic of Macedonia"

Mentor:

Asst. Prof. Dr.

Gjoko Stamenkov

Candidate:

Rezarta Zhaku - Hani

I hereby declare that I am the sole author of this thesis. All sentences cited in this thesis from other articles and books have been properly cross-referenced.

Rezarta Zhaku - Hani

_____

ABSTRACT

The purpose of this paper is to investigate the most important factors that influence the post adoption use of Education Management Information System (EMIS) in the primary public schools in Struga. To better understand the key factors of EMIS post adoption, a conceptual model of factors was developed. The conceptual model was grounded on Technology Acceptance Model (TAM) framework and Technology Organization Environment (TOE) framework. Data collection was done by surveying and interviewing the teachers of the primary public schools in Struga. The analysis of the data was done by using SPSS software, and later on the results are used to test the hypotheses. The research findings show that, post adoption in personal level and post adoption in school, depend on different independent variables and that Benefits, External ICT Support and Technology Knowledge are the key factors that influence the post adoption of EMIS.

АБСТРАКТ

Целта на оваа теза е да ги истражи најважните фактори кои влијаат на прифаќање за користење на информациониот систем за управување со едукација во основното образование (ЕМИС) во Струга. Со цел подобро да се разберат клучните фактори на прифаќање на системот, во оваа теза е развиен концептуален модел. Коцептуалниот модел е базиран на теориите Technology Acceptance Model (TAM) и Technology Organization Environment (TOE). Собирање на податоци е извршено преку прашалници и интервјуа на учители во училишта на основно образование во Струга. Анализа на податоците е направена со SPSS, и поставените хипотези се тестирани со помош на податоците. Резултатите посочуваат дека прифаќањето на лично ниво и на ниво на училиште зависат од различни фактори, и дека клуните фактори за прифаќање на EMIS се бенефит од користење на системот, надворешна ИКТ поддршка и технолошко знаење.

ABSTRAKT

Qëllimi kryesor i këtij studimi është të hetojë faktorët më të rëndësishëm që ndikojnë në pranimin e Sistemit të Arsimit të Menaxhimit të Informacionit (EMIS), në shkollat publike fillore në Strugë. Për të kuptuar më mirë faktorët kryesore të pranimit të EMIS, zhvilluam një model konceptual të faktorëve. Modeli konceptual është bazuar në kornizat e Technology Acceptance Model (TAM) dhe Technology Organization Environemt (TOE). Mbledhja e të dhënave është bërë përmes pyetësorëve dhe intervistimit të mësuesëve të shkollave publike fillore në Strugë. Analiza e të dhënave është bërë duke përdorur SPSS, dhe më vonë këto rezultatet janë përdorur për të testuar hipotezat. Rezultatet e hulumtimit tregojnë se, pranimi i sistemit në nivel personal dhe në nivel të shkollës, varen nga variabla të ndryshme dhe që faktorët kryesorë që ndikojnë në pranimin e EMIS janë benefitet e shfrytzimit të sistemit, mbështetja e jashtme IKT dhe njohuria teknologjike.

Table of Contents

List of Tables

List of Figures

1. INTRODUCTION

The field of this research is implementation of information system (IS) in education in Republic of Macedonia. There are many definitions of IS, but they all include the notion of data. We present one definition: “An information system (IS) is a set of interrelated components that collect, manipulate, store, and disseminate data and information and provide a feedback mechanism to meet an objective” (Reynolds & Stair, 2010, p. 4). It is the feedback mechanism that helps organizations achieve their goals, such as increasing profits or improving customer service. Businesses can use information systems to increase revenues or reduce costs (Reynolds & Stair, 2010) .

Today we live in an information economy whereby information becomes a valuable resource, and information exchange becomes a dominant, instead of tangible goods exchange (Reynolds & Stair, 2010). Integration of the IS components, i.e., application programs, information resources like databases and/or knowledge bases, and user interfaces enables to accomplish a business purpose (Guarino, 1998). Education is one of the main factors on the development growth. Thus, we need to monitor and evaluate constantly the learning system. In this way we will be able to assure more resources for maximizing student learning in the education system (Hua & Herstein, 2003) .

In our research the Information System that we are studying is an Education Management Information System (EMIS). There are many definitions of EMIS, but here we are presenting the following: “The education management information system (EMIS) is a sub-system of an education system whose aim is to collect, store, process, analyze and disseminate information” (Carrizo, Sauvageot, & Bella, 2002, p. 12). EMIS purpose is to provide with information and knowledge the decision making system and the operating system of an organization (Carrizo, Sauvageot, & Bella, 2002).

Macedonia is one of the newest countries that started using EMIS in its Education Institutions through implementation of E-Dnevnik. By using EMIS the public primary and secondary schools in Macedonia will be able to collect, verify, process and report the data about the students and their attainment.

1.1 Research question

The main goal of this research is to investigate the most important factors and gaps regarding the EMIS appliance in the Education System in Macedonia. We have to mention that regarding to the Cambridge dictionary the word adoption can refer to the post adoption phase as well. EMIS was a project that was implemented by the government without consulting with teachers of the public schools that were going to use it. Taking into consideration that the usage of EMIS was not voluntary for teachers of these public schools, we thought that there might be some turbulent situation on the adoption of this system.

The purpose of this study is to find out the most important independent variables that influence EMIS adoption, and to find out the gaps of EMIS that is used in the education system of Macedonia for primary and secondary schools. To the best of our knowledge, there is no other research done on this topic and that is one of the main reasons why we decided to work on it.

There are two main aims of this research:

1. Theoretical: the aim is to find out which are the independent variables with the highest impact on the EMIS. To achieve this we will use the Technology Acceptance Model (TAM) and Technology Organization Environment (TOE) model;

2. Practical: the aim is to find out the gaps of the implemented EMIS; to achieve this aim we will do a critical analysis of the current system which might show future directions to improve the system.

Figure 1 shows this study's conceptual framework. The conceptual framework presents the theories adopted in this study: TAM and TOE. Based on the theoretical background, conceptual framework and interviews, we declare the hypotheses.

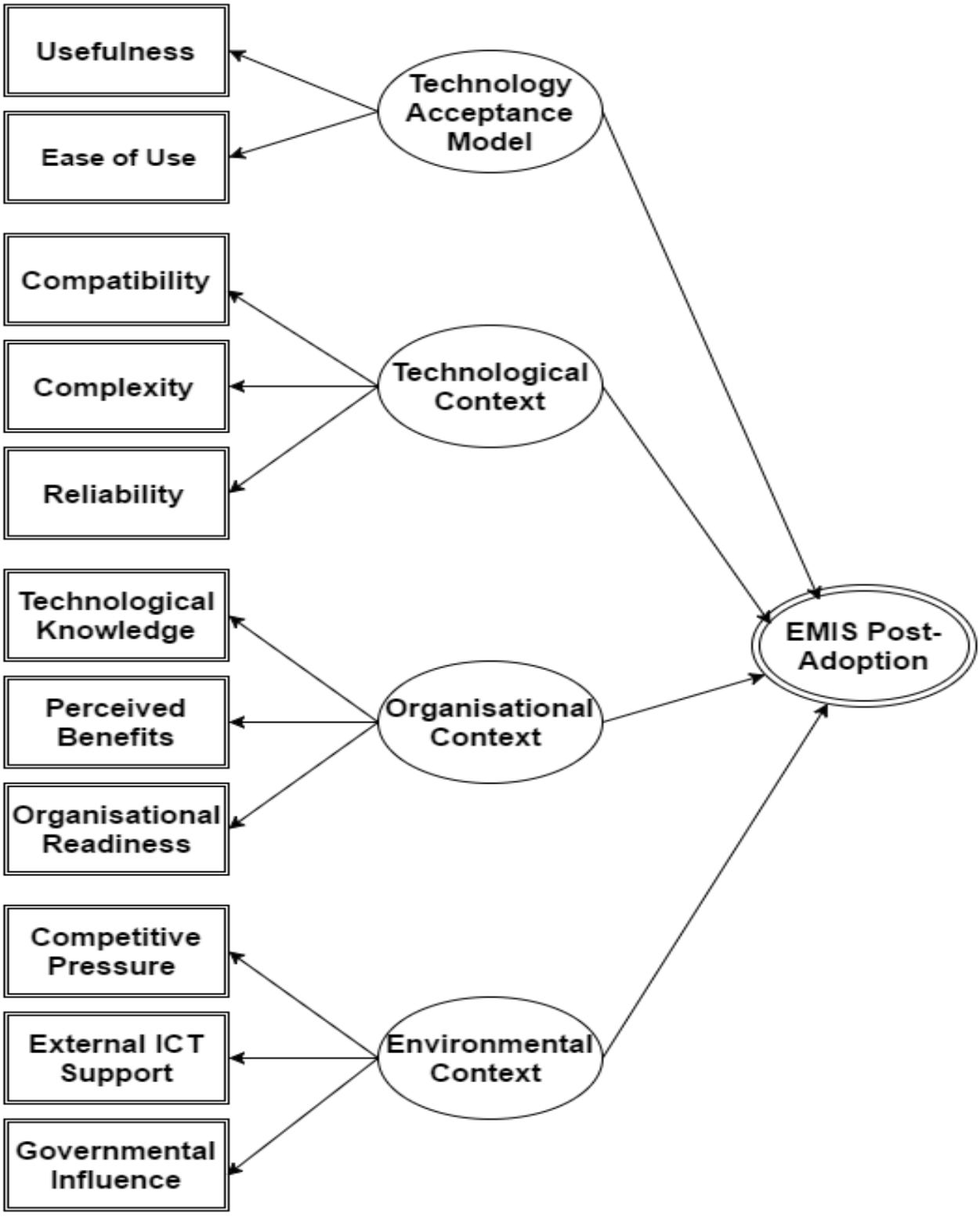

Figure 1. Conceptual Model

It has passed more than five years since the implementation of EMIS, and based on our research there is no evidence of a research study that has been done to analyze its functionalities or its effect on the education system of Macedonia for Primary and Secondary Schools. On the other side through conducting interviews with teachers in the primary schools of Struga, I found out that they have complaints about EMIS implementation and its functionalities which leads to a low level of user acceptance. Despite the previous findings, the government wants to raise the user acceptance by raising punitive measures towards employees who don't use it. The above described situation motivated us to do a research and investigate how EMIS is being used in the primary schools of Struga and what are the requirements for facilitating its use. Another aim is, with the results of the study, to raise awareness of the situation and to use this study's results for future improvements of EMIS in the Education System of Macedonia.

Therefore, we want to research how and which factors influence adoption of the information systems in education, focusing on the EMIS in Republic of Macedonia.

1.2 Why it is important?

The final results of the research document, will be able to show which are the factors and problems that have created the turbulent situation in the user acceptance of EMIS, and if there is something that we could do in order to fix it. During the study, theoretical and practical analysis are applied and based on the results, recommendations for improving EMIS are proposed. All the data are gathered through a mixed method and it is going to show the overall user satisfaction of the teachers that use EMIS. The research will be also useful for the Ministry of Education and Science in Macedonia, for the EMIS maintenance and future investments in this field.

The Education Management Information System is a very important factor of the Education System in Macedonia, therefore the importance of the research study is considered of a very high level.

1.3 Who will benefit?

This research study can be very useful for the Ministry of Education and Science in Macedonia. They can use the results of our study for maintaining EMIS and for future investments in this field. Taking into consideration that the Education Management Information System is a very important factor of the Education System in Macedonia and that to the best of our knowledge there is no other research done that addresses this topic, the importance of the research study is considered of a very high level.

2 RESEARCH BACKGROUND AND HYPOTHESES DEVELOPEMENT

2.1 Research Background

In this chapter a research background is presented that is foundation of our research. The literature is presented that is related to usage and acceptance (adoption) of information technologies. The theoretical background serves as a tool to understand and interpret our research study findings in the context of primary public schools in Struga, Republic of Macedonia (Joseph, 2011) .

Nowadays education has become a huge field of interest (Moses, 2000, cited in , Joseph, 2011). The management quality of educational process can be indirectly influenced by technology, thus influencing positively the education delivery (Konopka & Korrapati, 2006, cited in, Joseph, 2011). According to Lewis, Agarwal and Sambamurthy (2003, p. 658) organizations increasingly depend on information technology for the execution of a variety of operational, tactical, and strategic processes (Joseph, 2011). Nevertheless, a single computer can do nothing on the enhancement of the educational services. The entire information sharing together with the elements of software, hardware, and networking is what creates a framework of operations (Konopka & Korrapati, 2006, cited in, Joseph, 2011).

According to (Yong Zhao, 2003)there are two factors that determine the degree of computer use by teachers: (a) the nature of the uses, and (b) the result of the teacher's analysis of the uses, whilst all other factors contribute to these two. An example of indirect influence of technology use could be IT training of teachers. Their IT training experience could influence the

facilitation of the ease of use before using the technology, based on training's helpfulness to teachers (Joseph, 2011).

Nevertheless the acceptance of new technology and adoption of it may be also influenced by the organizational environment as: customers, suppliers, government regulations, etc. These could provide incentives or barriers on the adoption of the new technology (Govindarajulu & Lippert, 2006).

To examine the adoption of Information Systems there have been used several theories: Technology Acceptance Model (TAM) (e.g. (Angeles, 2013)), Theory of Planned Behavior (TPB) (e.g. Harrison et al., 1997); Diffusion of Innovations (DOI) (e.g. Premkumar, 2003), combined TPB and TAM (e.g. Riemenschneider et al., 2003); Technological-Organizational-Environmental model (TOE) (e.g. (Govindarajulu & Lippert, 2006)), combination of TAM andTOE (e.g. (Joseph, 2011)); etc. While these research have produced a huge amount of findings, researchers focus mostly on investigating only the impact of a limited number of variables that have been empirically tested before on their influence on the adoption of IS (Jeyaraj et al., 2006, cited in, Ramdani, 2013). In our study we are going to use a combination of technology acceptance model (TAM) and technological organizational environmental model (TOE) in order to analyze properly the EMIS that is being used by the primary and secondary public schools in the R. of Macedonia.

By using EMIS the public primary and secondary schools in Macedonia are able to collect, verify, process and report the data about the students and their attainment. EMIS, which is a responsibility of the State Educational Inspectorate, can do all these processes and procedures by providing the supervision model. There is another module for export/import of data which is used to cooperate with stakeholders such as: Ministry of Health, Ministry of Finance, State Statistical Office, etc (Ultra Computing, 2010).

We mentioned above that the scope of our research is E-Dnevnik that is being used as a component of EMIS. With an intention of improving communication between parents and teachers, to enable fast access and detailed information by the teachers at every school, to enable quick and centralized statistical analysis from Ministry of Education and Science (MES)

and different institutions, etc., Ministry of Education and Science (MES) decided to bring in use the project called E-Dnevnik. In order for E-Dnevnik to be built as a web-based application, hardware and software platforms of the Ministry of Education and Science were used. The crucial data for E-Dnevnik such as: schools, pupils, classes and teachers, are taken from another educational system which is responsible for collection, processing, verification and presentation of data that are important for the educational system for primary and secondary education in Macedonia. The synchronization of these two systems is done on daily basis (MOES, 2015). Every academic year since 2010-2011, E-Dnvenik is improving its functionalities and getting better. In the beginning it started operating only with a few modules, but now it has been upgraded in order to comply with new functionalities for the education system. Based on the authorization the users have towards the data when using E-Dnevnik, it's users' profiles are divided as follows: teachers, management staff (director), non-teaching staff (teacher, psychologist), parent and inspector (MOES, 2015).

The functionalities that are covered by EMIS are: maintenance of schools (school directory), maintenance of students (registration), maintenance of teachers (registration), maintenance of teachers (post), maintenance of non-teaching staff, maintenance of student outcomes, excluding matura results, maintenance of student absences, school building and school assets, finance - expenditure, school annual plan, maintenance of staff absence, maintenance of pupil / class allocation, entry of text book catalogue, identification of text book usage, maintenance of training catalogue, maintenance of school inspection details, maintenance of ad-hoc investigations, entry of finance data (by school administration), entry of finance data (by municipality administration), maintenance of list of inspectors; load of Matura Results, maintenance of look up lists, sending data to MoF, delivery of data to SSO, maintenance of work structures of the Ministry of Education and public schools, personnel administration - employment and deployment details, employment history, career management, training and professional development administration, employee administration, absence monitoring and accrual plan, compensation and benefits. Total number of users of the system is about 1200 (440 schools times 2 staff each plus municipalities: 83 municipalities times 3 staff each) (Ultra Computing, 2010).

2.2 Hypotheses

In this part we are going to present theoretical backgrounds and our conceptual model. There are also hypotheses that are created based on the interviews that we did with the teachers, because of the lack of theoretical background.

During the interviews we discovered two things regarding the analysis of the post adoption phase.

1. We should divide the post adoption phase in two parts, where one belongs to the post adoption phase in the context of the institution where they work and the other one is the post adoption phase in the context of their personal believes and preferences.
2. They suggested that the factor benefits might be in the role of the mediator between the post adoption factor and the other factors.

From this we can conclude that:

- Our dependent variables are: Benefits (a), Post Adoption in the context of the institution - Post_Adoption_sc (b) and Post Adoption in the personal context - Post_Adoption_p (c).

Technology Acceptance Model

TAM is one of the most influential theories for describing an individual's acceptance of information systems (Lee, Kozar , & Larsen, 2003). According to TAM, an individual's information systems acceptance is determined by two variables, i.e. perceived usefulness (PU) and perceived ease of use (PEOU) (Davis, 1989).

Perceived usefulness is defined as "the degree to which a person believes that using a particular system would enhance his or her job performance" (Davis, 1989, p.320). This comes from the definition of the word useful: "capable of being used advantageously". Promotions, salary rises, bonuses, and other rewards are the main reason that people are motivated to perform better, within an organization context (Pfeffer, 1982, cited in Davis, 1989). Perceived ease of use is defined as "the degree to which a person believes that using a particular system

would be free of effort" (Davis, 1989, p.320). This follows from the definition of "ease": "freedom from difficulty or great effort". Effort is defined as a finite resource that a person allocates to the activities" (Radner & Rothschild, 1975, cited in Davis, 1989, p. 320).

Since both of these variables are compatible with our research we are going to use both of them as hypotheses under the TAM model.

H1: Perceived usefulness has a positive effect on benefits(a), EMIS Post_Adoption_sc(b) and EMIS Post_Adoption_p(c).

H2: Perceived ease of use has a positive effect on benefits(a), EMIS Post_Adoption_sc(b) and EMIS Post_Adoption_p(c).

Technology Organization Environment

According to Technological-Organization-Environment theoretical framework, three aspects that mostly influence technological adoption are: environmental context, organization context, and technological context (Micheni, 2015). Besides the factors that are identified within the TOE framework there exist other factors as well. Factors such as technical issues, software, training and support, EMIS leadership and EMIS access, all affected the use of the EMIS (Joseph, 2011).

Technological context

The technological context refers to the technology, internal or external that are related to the institution (Zhu, Kraemer, & Xu, 2002). If one organization has a strong technical competence, then it will help the adoption of new information technology, since it is a basis upon which these technologies are built (Gibs & Kraemer, 2004).

A technological context refers to the adoption of a new technology or application. This context is divided into three considered most important variables, based on existing research studies. The three variables are: security concerns, reliability and deployability (Lippert & Govindarajulu, 2006). Nevertheless there exist other variable as well, and their usability

depends on the type of the research study. In our study the variables that fit most under the technological context are: Complexity, Compatibility and Observability.

When an innovation is perceived as difficult to use and understand, it means that the level of complexity is relatively high (Rogers, 2003, cited in Ramdani, 2013). The uncertainty of a successful implementation is caused by the technology complexity, which therefore increases the risk of adoption (Premkumar and Roberts, cited in Ramdani, 2013). Therefor we state the following hypotheses:

H3: Perceived complexity has a negative effect on benefits (a), EMIS Post_Adoption_sc (b) and EMIS Post_Adoption_p (c).

Compatibility represents the degree to which the new system is similar to the old one, in the context of values, experiences and needs (Rogers, 2003, cited in Lippert & Govindarajulu, 2006). In our study we propose the following hypothesis:

H4: Perceived compatibility has a positive effect on benefits(a), EMIS Post_Adoption_sc(b) and EMIS Post_Adoption_p(c)

Nambisan and Wang (1999) identified the issue of security, both real and perceived, as a factor affecting the intention to adopt and actual adoption behavior. This variable is not appropriate for our study since our study is a post adoption research. The EMIS adoption is a project that is approved from the MOES, and whether it is secure enough or not, the decision for adoption will not change.

Organizational context

"Organizational context refers to the effect of organizational characteristics on the decision to adopt web services" (Govindarajulu & Lippert, 2006, p. 153). The organizational context relates to firm's business scope, top management support, organizational culture, complexity of managerial structure measured in terms of centralization, formalization, and vertical differentiation, the quality of human resource, and size and its related issues such as internal slack resources and specialization (Awa, Ukoha, & Emecheta, 2012) .

Most of the adoption research and information system literature, consider the firm scope and firm size of the organization as the most important variables under organizational context (Rogers, 1995; Tomatzky and Fleischer, 1990, cited in Govindarajulu & Lippert, 2006). But none of them are relevant for our research, since the adoption is mandatory. There are other variables which go under organizational context, that are relevant to our research. In our study we adopt technological knowledge, since it represents the institutional technological knowledge of an organization (Govindarajulu & Lippert, 2006).

H5: Technological knowledge has positive effect on benefits(a), EMIS Post_Adoption_sc(b) and EMIS Post_Adoption_p(c)

Perceived benefits is a very important factor in the adoption of a new technology. Perceived benefits can be explained as the degree to which a person can perceive positive consequences after using a particular system (Govindarajulu & Lippert, 2006). Thus this factor is considered as relatively important to our study.

H6: Perceived benefits have a positive effect on EMIS Post_Adoption_sc(b) and EMIS Post_Adoption_p(c)

Environmental context

Environmental context is defined by the will of organizational users and their preparation on new technology adoption (Yang, Sun, Zhang, & Wangd, 2014). The environmental context relates to the external factors as institutions surroundings, stakeholders such as sponsors, government, community, and competitive pressure and these factors can be key success factors for making organizations pursuing information, do innovations, and achieving competitive advantage (Angeles, 2013). The above mentioned factors are considered with very high impact on EMIS, regarding TAM and TOE framework.

There are several variables that are used under Environmental Context, but the ones that are more relevant to our study are: competitive pressure, governmental influence and external ICT support.

One of the best determinants of new technology adoption is competitive pressure. If the most of the competition is adopting a new technology, then most probably the decision makers would feel the pressure to do the same, so they can gain a competitive advantage (Yang, Sun, Zhang, & Wangd, 2014). We can see that competitive pressure is a very important variable in the Environmental Context, but while discussing this with the teachers during the interviews we found out that it is not relevant for our case. Instead they pointed out that there exists some kind of pressure from the parents of the students. Based on what they said we replaced Competitive Pressure with the variable Pressure from Parents.

H7: Pressure from Parents has a positive effect on benefits(a), EMIS Post_Adoption_sc(b) and EMIS Post_Adoption_p(c)

Based on the interviews with some professors, we found that governmental influence could be a very strong variable used under environmental context.

H8: Governmental cooperation has a positive effect on benefits(a), EMIS Post_Adoption_sc(b) and EMIS Post_Adoption_p(c)

External ICT support facto refers to the support that the organization is able to receive for implementation and usage of ICT. Studies have proved that this factor has a positive impact on the success of the ICT support of an organization and that it is positively related with the ICT adoption for organizations. The popularity of outsourcing has been and indicator for the adoption of the external ICT support by different organizations (Premkumar and Roberts, 1999, cited in Ramdani, 2013).

H9: External ICT support has a positive effect on benefits(a), EMIS Post_Adoption_sc(b) and EMIS Post_Adoption_p(c)

The goal of this study is to investigate the most important factors and gaps of EMIS. Based on the theoretical review we have articulated the hypotheses in the previous sections. To achieve the goals we will use Technology Acceptance Model (TAM) and Technology Organization Environment (TOE) framework.

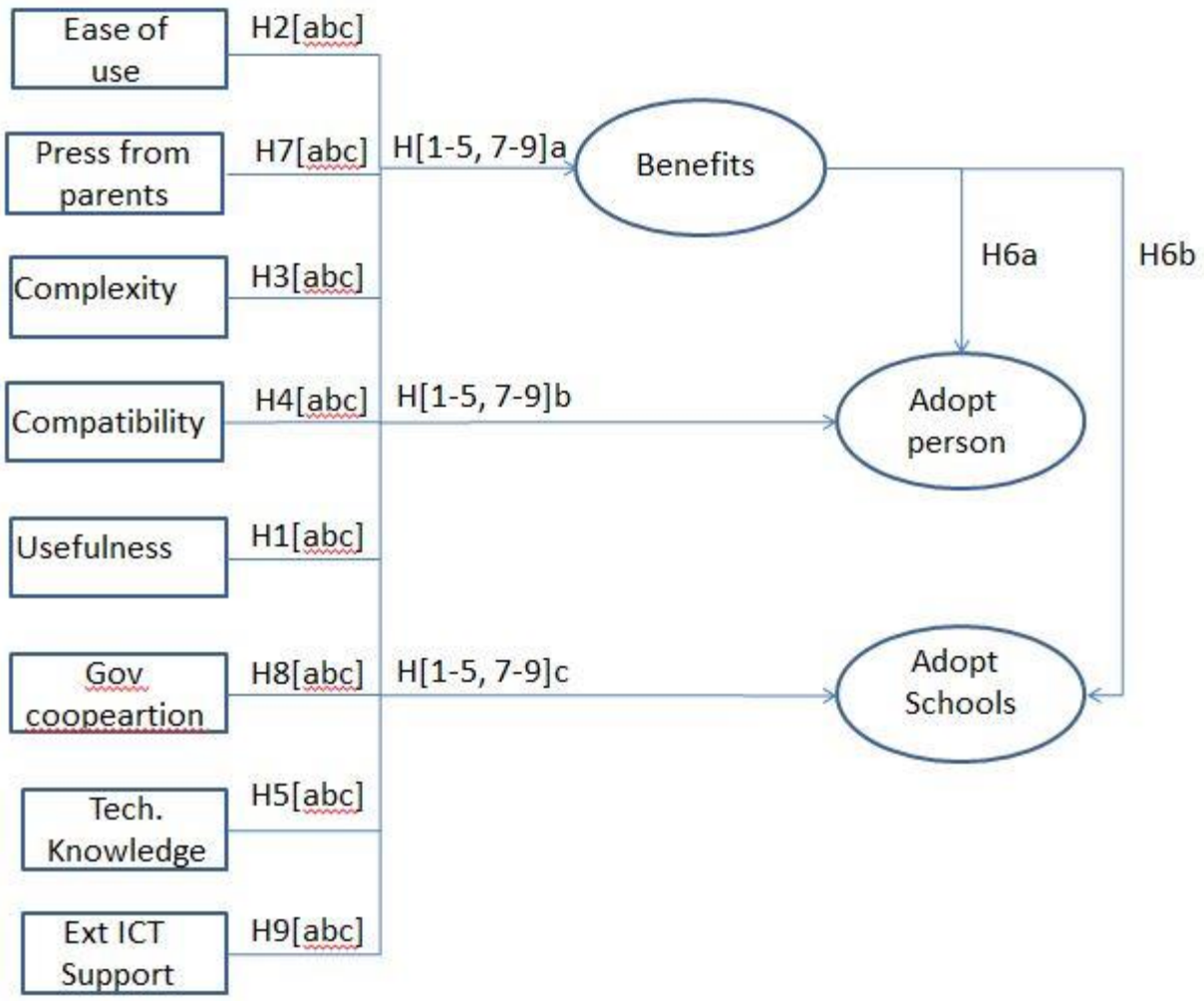

Figure 2. Proposed Model

We present Figure 2 that shows our proposed model with the declared hypotheses

3 METHODS

In this chapter we will discuss the population and sample, type of analysis, operationalization of factors, instrument development, content and face validity of the questions and the tool that we are using to analyze the results.

3.1 Population and sample

In this research study the population will be all the teachers in Macedonia. Our sample consists of the teachers from primary schools in Struga. The scope of our research is E-Dnevnik, which is a component of EMIS.

3.2 Qualitative and quantitative analysis

Types of research methods are: quantitative, qualitative and mixed-method. Depending on the research goals, there are several mixed-methods types.

"A mixed methods approach is one in which the researcher tends to base knowledge claims on pragmatic grounds (e.g., consequence-oriented, problem-centered, and pluralistic)" (Creswell, 2003, p. 21). The data could be collected either simultaneously or sequentially, in order to understand the problem. Data could be numeric or alphabetic, thus the results at the end could be quantitative or qualitative. (Creswell, 2003)

When mixed method is used on a research, it means that the problem is more important than the method, and researchers mix all the necessary approaches to understand the essence of the problem (Rossman and Wilson, cited in Creswell, 2003).

Pragmatism, in the mixed methods research, provides researchers with the right of choosing and mixing methods, making assumptions, having different world views, and different methods of collecting data and making analysis. (Creswell, 2003)

According to (Creswell, 2003) there are three main strategies that are used when doing a mixed methods research, such as: sequential procedures, concurrent procedures and transformative procedures.

1. Sequential procedures relate to elaboration on or expansion of the findings of one method with another method (Creswell, 2003).
2. Concurrent procedures- “In which the researcher converges quantitative and qualitative data in order to provide a comprehensive analysis of the research problem” (Creswell, 2003, p.19).
3. Transformative procedures-“In which the researcher uses a theoretical lens as an overarching perspectives within a design that contains both quantitative a qualitative data (Creswell, 2003, p.19).

For our research we choose the sequential procedures of mixed methods, first performing qualitative method, then quantitative. The quantitative method deployed a survey with questions that are based on the TAM and T-O-E framework. We have adopted questions from the existing studies which we have also adapted for our context that is already described above. Before sending surveys to the prospective respondents we have checked their validity with respondents that approved whether question wording is appropriate and with subject matter expert to check whether questions extract the factor essence.

The results that we have obtained from questionnaires and interviews are the base sources of our findings and discussions.

3.3 Operationalization of the factors

According to (Shuttleworth, 2015) “operationalization is the process of strictly defining variables into measurable factors. The process defines fuzzy concepts and allows them to be measured, empirically and quantitatively”. An example would be if a school is going to expel students based on their aggression, first they would need to define what aggression means. To explain that first they would need to do operationalization which means that they are going to explain at what point a student’s behavior is considered aggressive.

In our research we are going to operationalization for each of the factors that we are using, in order to have a deeper understanding of the situation we are analyzing. We are using ten factors which are: Usefulness(U), Ease of Use (EoU), Complexity (C), Compatibility (Comp),

Technological Knowledge (TK), Benefits (B), Pressure from Parents (PfP), Governmental Cooperation (GC), External ICT Support (EICTS), Post Adoption (PA).

Usefulness. The definition of usefulness is "the degree to which a person believes that using a particular system would enhance his or her job performance" (Davis, 1989, p.320). In our research we have used efficiency, productivity, quality, and speed of accomplishing tasks, as variables through which we measured usefulness. Four of them were used from (Gangwar & Date, 2015) and one was extracted from the interviews with the teachers. In our case if the teachers believe that using E-Dnevnik would help their job performance to enhance then they would answer positively towards questions under the factor of Usefulness.

Ease of Use. Perceived ease of use is defined as "the degree to which a person believes that using a particular system would be free of effort" (Davis, 1989, p.320). This follows from the definition of "ease": "freedom from difficulty or great effort. Effort is defined as a finite resource that a person allocates to the activities"(Radner & Rothschild, 1975, cited in Davis, 1989, p. 320). We are measuring this factor through four indicators from (Gangwar & Date, 2015). They are all related to the effort a teacher should put on using the system. In our case this would mean that if a teacher believes that using E-Dnevnik would be free of effort then they would answer positively towards the questions under the factor of Ease of Use.

Complexity. When an innovation is perceived as difficult to use and understand, it means that the level of complexity is relatively high (Rogers, 2003, cited in Ramdani, 2013). The uncertainty of a successful implementation is caused by the technology complexity, which therefore increases the risk of adoption (Premkumar and Roberts, cited in Ramdani, 2013). We are measuring this factor through four variables. The first and second variables are taken from (Gangwar & Date, 2015) whereas the third and fourth variables are taken from An Empirical Analysis of Factors Influencing Internet/E-Business Technologies Adoption by SMEs in Canada., (Ifinedo, 2011). In our case if a teacher believes that using E-Dnevnik is complex, then they would answer negatively towards the questions under the factor of Complexity.

Compatibility. Compatibility represents the degree to which the new system is similar to the old one, in the context of values, experiences and needs (Rogers, 2003, cited in Lippert &

Govindarajulu, 2006). We are explaining compatibility through five indicators. The first two questions are taken from (Gangwar & Date, 2015), the third question is taken from An Empirical Analysis of Factors Influencing Internet/E-Business Technologies Adoption by SMEs in Canada., (Ifinedo, 2011) and the fourth and fifth questions are taken (Gibs & Kraemer, 2004).In our case, if the teachers believe that the new system is compatible with the old one then they would answer positively towards all the questions under the factor of Compatibility.

Technological knowledge. Technological knowledge represents the institutional technological knowledge of an organization (Govindarajulu & Lippert, 2006). We are measuring this factor through four variables. The first three variables are taken from (Lee M. S., 2009) and the fourth one is created based on the interviews we did with the teachers.

Benefits. Perceived benefits is a very important factor in the adoption of a new technology. Perceived benefits can be explained as the degree to which a person can perceive positive consequences after using a particular system (Govindarajulu & Lippert, 2006). Thus this factor is considered as relatively important to our study (Govindarajulu & Lippert, 2006). We are using five variables to measure this factor. All of them are taken from (Infinedo, 2011). In our case if the teachers believe that using E-Dnevnik is beneficial to them they would answer positively to all the questions under the factor Benefits.

Pressure from Parents. One of the best determinants of new technology adoption is competitive pressure. If the most of the competition is adopting a new technology, then most probably the decision makers would feel the pressure to do the same, so they can gain a competitive advantage (Yang, et al., 2014). We can see that competitive pressure is a very important variable in the Environmental Context, but while discussing this with the teachers during the interviews we found out that it is not relevant for our case. Instead they pointed out that there exists some kind of pressure from the parents of the students. Based on what they said we replaced Competitive Pressure with the variable Pressure from Parents. We are using four variables to measure this factor. All of the variables are extracted from the interviews with the teachers. In our case if the teachers believe there is pressure from parents to use E-Dnevnik

then they would answer positively to all the questions under the factor of Pressure from Parents.

Governmental Cooperation. Based on the interviews with some professors, we found that governmental influence could be a very strong variable used under environmental context. We are using five variables to measure this factor. The first, second and third variables are taken from (Infinedo, 2011) whereas the fourth and fifth questions are taken from (Looi, 2005). If the teachers believe there is no cooperation from the government on using E-Dnevnik then they would answer negatively to all the questions under the factor of Governmental Cooperation.

External ICT support. This factor refers to the support that the organization is able to receive for implementation and usage of ICT. Studies have proved that this factor has a positive impact on the success of the ICT support of an organization and that it is positively related with the ICT adoption for organizations. The popularity of outsourcing has been and indicator for the adoption of the external ICT support by different organizations (Premkumar and Roberts, 1999, cited in Ramdani, 2013). We are using four variables for measuring this factor. The first variable is extracted from the interviews with the teachers, the second and the fourth variable are taken from (Ghobakhloo, Sabouri, Hong, & Zulkifli, 2011), and the thir variable is taken from (Igbaria, Zinatelli, Cragg, & Cavaye, 1997).

Post Adoption. This factor refers to the post adoption phase of E-Dnevnik on two levels: personal and school level. First three questions measure the post adoption in the school level, while the fifth one measures the adoption in the personal level

3.4 Instrument development

By observing Table 1 we can see the instrument, the factors, questions from the questionnaire, and item notations. If any of the questions does not have an origin, it means that it was created based on the authors' opinion regarding the interviews done with the teachers. The content validity of the instrument was assessed by acquiring opinions by two experts on that if our questions were representative and relevant of the factors they were supposed to measure. The

number of measurement level was 5 (1=Strongly Disagree, 5= Strongly Agree) (Stamenkov & Dika , 2015).

Factor	Question	Measurement	Item
Usefulness	Using E-Dnevnik allows me to manage education in an efficient way	Efficiency	U1
	Using E-Dnevnik allows me to increase my productivity	Productivity	U2
	Using E-Dnevnik enables me to accomplish my tasks more quickly	Speed of accomplishing tasks	U3
	The use of E-Dnevnik improves the quality of education	Quality	U4
	E-Dnevnik is a very useful tool	/	U5
Ease of Use	The procedure of using E-Dnevnik is understandable	Understandment	EoU1
	It is easy for us to learn how to use E-Dnevnik	Degree of difficulty to be learnt	EoU2
	It is easy to use E-Dnevnik	Degree of difficulty to be used	EoU3
	It is not required to have deep knowledge of IT to use E-Dnevnik	Level of IT knowledge to use E-Dnevnik	EoU4
Complexity	E-Dnevnik is not flexible to interact with	Flexibility	C1
	When I perform many tasks together, using	Degree of	C2

Factor	Question	Measurement	Item
	E-Dnevnik takes up too much of my time	wasted time	
	Using E-Dnevnik requires a lot of mental effort	Level of mental effort	C3
	Using E-Dnevnik is frustrating	Frustration	C4
Compatibility	E-Dnevnik is compatible with existing technological architecture of the school I work for	Level of similarity with the old system	Comp1
	The changes introduced by E-Dnevnik are consistent with existing practices in the school I work for	Consistency	Comp2
	Using E-Dnevnik fit into our working style	Level of suitableness	Comp3
	The time to learn E-Dnevnik didn't influence negatively the productivity of our work	Productivity	Comp4
	E-Dnevnik didn't require an overall change in the values, norms and culture within the school I work for	Level of change required by using E-Dnevnik	Comp5
Technological Knwoledge	Our employees have the ability to use E-Dnevnik system	Levele of existed ability to use E-Dnevnik	TK1
	Our employees have the overall knowledge about E-Dnevnik system	Level of existed knowledge to use E-Dnevnik	TK2
	Our employees know the advantage of E-Dnevnik compared with traditional system	Level of information on E-dnevnik	TK3

Factor	Question	Measurement	Item
	Our employees have sufficient knowledge about computer and Internet technology	Level of knowledge on IT	TK4
Benefits	E-Dnevnik allows the school I work for to manage the process of education efficiently	Management of education processes	B1
	E-Dnevnik improves the quality of the education process	Quality improvement	B2
	E-Dnevnik enhances the effectiveness of the education process	Enhancement of Effectiveness	B3
	E-Dnevnik enables us to perform the education process more quickly	Performance of education processes	B4
	E-Dnevnik gives us a greater control over the education process	Level of Control on Education Processes	B5
Pressure from Parents	Parents complain when certain information regarding their children does not figure on E-Dnevnik.	Parents influence	PfP1
	We are under pressure from parents to use E-Dnevnik properly	Parents influence	PfP2
	Parents know the importance of E-Dnevnik and are using it very often	Parents influence	PfP3
	Parents prefer E-Dnevnik over traditional way of getting information about their children	Parents preferences on old and new system	PfP4
Governmental	The school I work for is not under pressure	Governemntal	GC1

Factor	Question	Measurement	Item
Cooperation	from some government agencies to use E-Dnevnik.	Pressure	
	The government is providing us with incentives (motivation) to adopt E-Dnevnik	Governmental motivatio	GC2
	The government is active in setting up the facilities to enable E-Dnevnik	Facilities offered by Government	GC3
	The government often inform us about the good points of E-Dnevnik	Information received from Government	GC4
	The government is helping in giving all kinds of assistance to help the school I work for to use E-Dnevnik properly	Help received by Government	GC5
External ICT Support	Inclusion of External ICT Company will have a very positive effect on EMIS post-adoption	Effect of External ICT	EICTS1
	Inclusion of External of ICT support Company helps me to execute tasks in a proper way	Degree of help received from External ICT company	EICTS2
	External technical support has a direct effect on post adoption	Effect of External ICT	EICTS3
	The competence of external company will improve the usage of EMIS	Effect of External ICT	EICTS4
Post Adoption	The school I work for makes use of E-Dnevnik, very often	Degree of usage of E-Dnenik by the schools	PA1
	The number of operations and activities, in	The level of	PA2

Factor	Question	Measurement	Item
	the school I work for, that require usage of E-Dnevnik is high	required use of E-Dnevnik	
	E-Dnevnik is used for all critical educational processes	Level of usage of E-Dnevnik on critical educational processes	PA3
	E-Dnevnik is the main channel through which parents get to know about their children	Use of E-Dnevnik by the Parents	PA4
	I am willing to use E-Dnevnik for my daily tasks	Use of E-Dnevnik for private tasks	PA5

Table 1. Instrument Development

3.5 Content and face validity of the questions

It was nearly impossible to capture all the factors for E-Dnevnik post adoption phase, based only on the literature. To strengthen the validity of our questions we did 10 interviews with the teachers from the primary school “Nuri Mazari” and “Aki Dika”. They mostly agreed with our model and also added some more factors that they thought might influence the EMIS post adoption (Stamenkov & Dika , 2015).

3.6 Result’s Analysis Tool

We have mentioned above that in order to collect the data we decided to use sequential procedures of mixed methods. Thus first we did interviews with 10 teachers and then the questionnaires. The interviews were a very important asset for helping us later on to build the questionnaire’s questions. After building the questionnaires we printed 170 copies and distributed them on 6 primary schools on the region of Struga. After 15 days we collected the questionnaires and performed a listwise-deletion, which made us end up with only 144 questionnaires. We used Microsoft Excel to import the data and SPSS to analyze it.

4 RESULTS

4.1 Sample and sample size

The subject of our study was the public schools of RM. We focused on the public primary schools in the region of Struga. The unit of analysis were the teachers that are working in these schools and are using E-Dnevnik to complete their duties. The study was conducted at one point in time, which means it was cross-sectional. The questionnaire was accessible for 15 days during January of 2017 (Stamenkov & Dika , 2015).

We collected 167 completed questionnaires. In all 51 were males and 93 were women. Totally 3% of the teachers had experience less than 2 years, 8% of teachers had experience in the range of 2 - 5 years, 14% of the teachers had experience between 6 - 10 years, 37% of teachers had experience between 11 - 20 years, and 37% of teachers had experience more than 20 years. To solve the missing data problem we used the listwise-deletion method, from which we were left with a sample of 144 respondents (Stamenkov & Dika , 2015).

The rule of thumb for the model complexity and sample size is N:q, where N represents the number of cases and q represents the number of parameters that require statistical measures (Jackson, 2003; Kline, 2011 ,cited in Stamenkov & Dika , 2015). Our sample size was 144 and the number of parameters was 45, a ratio of 3.2:1. Under ideal circumstances (no missing data and correct measurements) sample size of 50 cases provide stable and valid results. According to (Hair et al., 2009, cited in, Stamenkov & Dika , 2015) our sample of 144 cases is considered as appropriate based on: we removed all observations with missing data; all communalities were above 0.5; data examination did not detect deviations that would influence results; and all our factor have more than 2 variables. For this study we have used factor scores where the number of parameters is 11 and the ratio is 144/11=13,09, which satisfies the requirement of minimum 10.

4.2 Dimension Reduction Analysis- Exploratory Factor Analysis

Before proceeding with the reductions in the factor analysis first we have to check for collinearity. When two variables are co-linear they do measure the same factor by different means. If we measure our weight twice by two different weight measure instruments and then correlate the results we would have collinearity, which is different if we correlate people's height and weight. We do not want to measure the same thing twice, that's why collinearity is not good for our research.

In factor analysis we can calculate Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO test) which is related to this. This test measures whether the data is adequate for a factor analysis. The cut-off point for this test is 0.5 and we can continue doing factor analysis only if the result is above 0.5($p > 0.05$) (Hinton, Brownlow, McMurray, & Cozens, 2005).

Except KMO test there is another analysis that can be performed before continuing with factor analysis and it is called Bartlett's test. This test measures whether the data is significant or if there is a relationship between the variables. If the significance is below 0.05($p < 0.05$) it means that it is significant and that we can continue; if not there's no point to continue with factor analysis and the data are not useful. If $p<0.001$ then there is a relationship between the variables (Hinton, Brownlow, McMurray, & Cozens, 2005).

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,813
Bartlett's Test of Sphericity	Approx. Chi-Square	3614,771
	df	741
	Sig.	,000

Table 2. KMO and Bartlett's Test

In Table 2 by observing the results we can see that the Kaiser-Meyer-Olkin Measure of Sampling Adequacy or KMO test is 0 .813 and Bartlett's Test is 0.000. Taking into consideration that both of them are good results we can come up with conclusions like the following: from $0.813>0.5$ we understand that our data is adequate for factor analysis, from $0.000<0.05$ we can understand that our data is significant, and from $0.000 < 0.001$ we can understand that there is

a relationship between the variables. These conclusions are a green light for us to continue with the factor analysis (Hinton, Brownlow, McMurray, & Cozens, 2005).

Exploratory factor analysis can be performed on different methods. Nevertheless, we have chosen the most popular one, principal component analysis, which will help us find the maximum amount of variances by the minimum number of underlying factors (Hinton, Brownlow, McMurray, & Cozens, 2005). Data collected in a questionnaire can be summarized and reduced by using factor analysis. The correlation between variables is used do see if there is any associations between variables, which would help on determining if there are any underlying factors (Hinton, Brownlow, McMurray, & Cozens, 2005) .

Factor analysis just like any other statistical analysis, has its own terminology. The word component and factor have the same meaning which refers to the variables that can explain the variability in the original data (Hinton, Brownlow, McMurray, & Cozens, 2005).

By performing this analysis we have to make a decision on the number of the factors that are important statistically. In order to do this decision we have to go through three sources of information which are: variance explained by each factor; the eigenvalue of each factor and examination of the scree plot of the factors and eigenvalue. A combination of these three sources of information would help us chose the most important factors for our research (Hinton, Brownlow, McMurray, & Cozens, 2005).

1. Variance explained by each factor

The output of the analysis calculates the variance each of the variables can explain. Usually the cut-off chosen point is 50 percent, and if any of the factors is listed below, it is said that it is not an important underlying factor (Hinton, Brownlow, McMurray, & Cozens, 2005).

What we are looking for in factor analysis is the variability of one variable that is common to other variables. This will show us the underlying factors that link the variables. At the beginning SPSS gives to every variable a communality of 1.000, based on that it assumes that 100% of the variance of each variable is common variance. Nevertheless, later when it extracts the factors, it works out how much of the variability can explain each of the extracted

factor, and gives us a new value of communality (Hinton, Brownlow, McMurray, & Cozens, 2005).

Communalities

	Initial	Extraction		Initial	Extraction
U1	1	0.695	PA3	1	0.58
U2	1	0.726	Comp1	1	0.786
U3	1	0.713	Comp2	1	0.753
U4	1	0.719	Comp3	1	0.574
U5	1	0.674	TK1	1	0.799
EoU1	1	0.822	TK2	1	0.78
EoU2	1	0.898	TK3	1	0.704
EoU3	1	0.869	TK4	1	0.757
EoU4	1	0.852	GC1	1	0.565
B1	1	0.691	GC3	1	0.495
B2	1	0.802	GC4	1	0.703
B3	1	0.775	GC5	1	0.747
B4	1	0.788	PfP1	1	0.713
B5	1	0.724	PfP2	1	0.671
EICTS1	1	0.813	PfP3	1	0.684
EICTS2	1	0.812	PfP4	1	0.661
EICTS3	1	0.89	C2	1	0.563
EICTS4	1	0.863	C3	1	0.823
PA1	1	0.715	C4	1	0.772
PA2	1	0.752			

Extraction Method: Principal Component Analysis.

Table 3. Communalities

By observing the Table 3 we can see the extraction value of each variable which tells us the proportion of variance for each of them (Hinton, Brownlow, McMurray, & Cozens, 2005).

If we see more in detail EoU (Ease of Use) variables they are all above 0.8 which means that the communality value of these variables is on an advanced level. EoU2 has the highest communality value of 0.898. This indicates that 89.8 percent of its variability is explained by the factors (Hinton, Brownlow, McMurray, & Cozens, 2005).

GC3 (Governmental Cooperation) is the variable that has the lowest communality value of 0.495. This indicates that 49.5 percent of its variability is explained by the factors.

By comparing the results we can observe that the lowest communality value (0.495) is lower than the cut-off line which is 50 percent (49.5%< 50%) but we keep it since it is close to 0.50 (Hinton, Brownlow, McMurray, & Cozens, 2005).

After defining the most important factors we did dimension reduction (exploratory factor analysis) and the results did not turn out good. To improve the results we can do a rotation to see which of the variables contribute the most on each factor.

2. The eigenvalue of each factor

During analysis performance for each factor is calculated an eigenvalue. If the eigenvalue is equal to one it means that the factor can represent as much variability as a single original variable. That is why each factor that has an eigenvalue equal or above 1 is considered as an important factor (Hinton, Brownlow, McMurray, & Cozens, 2005).

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	9,101	23,335	23,335	9,101	23,335	23,335	3,938	10,097	10,097
2	4,390	11,257	34,592	4,390	11,257	34,592	3,851	9,873	19,971
3	3,273	8,393	42,984	3,273	8,393	42,984	3,734	9,575	29,545
4	3,036	7,785	50,770	3,036	7,785	50,770	3,639	9,330	38,876
5	2,214	5,677	56,447	2,214	5,677	56,447	2,913	7,469	46,345
6	1,596	4,094	60,541	1,596	4,094	60,541	2,612	6,697	53,042
7	1,505	3,859	64,400	1,505	3,859	64,400	2,137	5,481	58,522
8	1,359	3,485	67,885	1,359	3,485	67,885	2,076	5,324	63,846
9	1,245	3,193	71,078	1,245	3,193	71,078	2,011	5,157	69,003
10	1,002	2,569	73,648	1,002	2,569	73,648	1,811	4,645	73,648
11	,899	2,305	75,952						

Extraction Method: Principal Component Analysis.

Table 4. Total Variance Explained

Taking into consideration our criterion of selecting eigenvalues over 1, in Table 4 we can see that 10 factors meet the requirements.

- The column Initial Eigenvalues Total shows the eigenvalues we are interested in. 10 factors have eigenvalue greater than 1.
- The % of Variance show how much variance each of the components can explain. If we had chosen to select all factor that had. In this case our factor analysis would have been different from what we are going to have on this research. Nevertheless we have decided to select the factor based on the eigenvalue of each of them.
- The Cumulative % column shows the amount of variance accounted for by each consecutive factor added together (Hinton, Brownlow, McMurray, & Cozens, 2005).

From our example in the Table 3 we can see that factor 1 has an eigenvalue of 9.101, which accounts for 23.335 percent of the variance. Based on our criterion of eigenvalue greater than 1, we have 10 factors which can explain 73.648% of the variance in data.

In SPSS there is also an option that allows us to choose the number of factors, but we have chosen to extract them based on criterion of the eigenvalue greater than 1.

3. Examination of the scree plot of the factors and eigenvalue

Scree Plot is graphical presentation of the same results as Table 3. Each important factor has an eigenvalue equal or greater than one. Starting from the first factor, the eigenvalue of the other factors starts to decrease until we reach a point where the line in the scree plot has a break and we have reached the eigenvalue of 1. Every factor above this break is retained and considered as an important factor, and all the other factors below the break point that have eigenvalues lower than 1 are considered statistically not important factors (Hinton, Brownlow, McMurray, & Cozens, 2005).

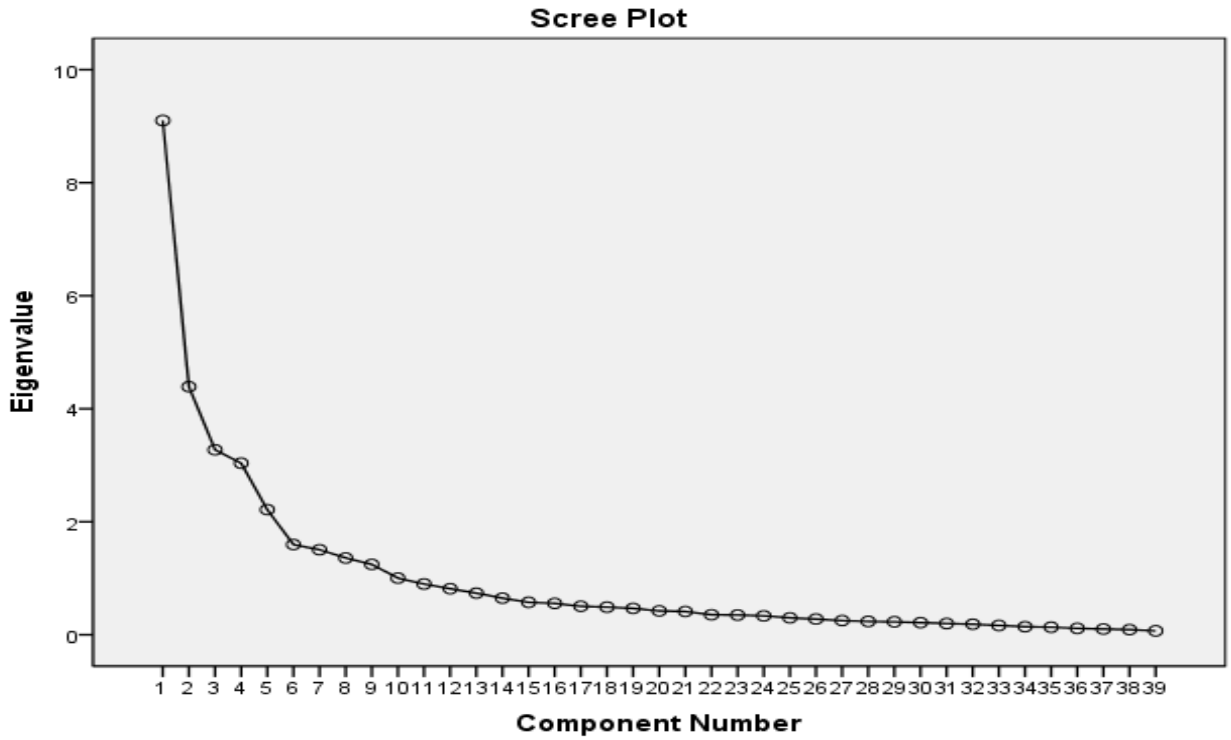

Figure 3. Scree Plot

In Figure 3 on the X-axis are presented the factors, whereas on the Y-axis are presented eigenvalues. The highest eigenvalue has the first factor, then the second highest Eigenvalue has the second factor, and so on (Hinton, Brownlow, McMurray, & Cozens, 2005). By observing the figure we can see that where the line starts to level out is a criterion for selecting how many factors to extract. In Figure 1 in the Scree Plot we can see that 10 factors are above Eigenvalue 1 and all the other potential factor are below to that value.

We have done dimension reduction (exploratory factor analysis) without rotation but the results were not good. Thus we can do a rotation to see which of the variables contribute the most on each factor. This is similar to when we have to move a picture on a wall horizontally or vertically, just so we could see it clearer. In this case we do a rotation of the variables to see more clear which of them is contributing enough on a given factor. All of the variables will load on all of the given factors, but as a given rule is that if the loading is equal or above 0.3, then that variable is making a contribution to a specific factor, otherwise the variable

is considered not significant and it should be deleted (Hinton, Brownlow, McMurray, & Cozens, 2005).

Rotated Component Matrix[a]

	Component									
	1	2	3	4	5	6	7	8	9	10
U1		,787								
U2		,792								
U3		,819								
U4		,806								
U5		,739								
EoU1				,870						
EoU2				,897						
EoU3				,905						
EoU4				,898						
B1	,692									
B2	,773									
B3	,780									
B4	,800									
B5	,778									
EICTS1			,842							
EICTS2			,856							
EICTS3			,896							
EICTS4			,872							
PA1							,712			
PA2							,838			
PA3							,660			
Comp1										,756
Comp2										,717
Comp3										,419
TK1					,835					
TK2					,845					
TK3					,653					
TK4					,750					
GC1								,608		
GC3								,506		
GC4								,714		
GC5								,730		
PfP1						,806				
PfP2						,687				
PfP3						,739				
PfP4						,691				
C2									,616	
C3									,840	
C4									,789	

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 8 iterations.

Table 5. Rotated Component Matrix

Because of selecting the Principal Component Analysis with a Varimax rotation, the Rotated Component Matrix gives us a clearer picture than the Component Matrix of our factor loadings onto the three factors (Hinton, Brownlow, McMurray, & Cozens, 2005).

By observing Table 5 we can now see a clearer picture of the 10 most important factors. Rotation shows that different variables load onto different factors.

The factors that were extracted well are:

- Factor 1 is related to variables that measure the benefits of E-Dnevnik. This factor was extracted well since all five variables loaded onto the same factor.
- Factor 2 is related to variables that measure the usefulness of E-Dnevnik. This factor was extracted well since all five variables loaded onto the same factor.
- Factor 3 is related to the variables that measure the external ICT support for E-Dnevnik. This factor was extracted well since all four variables loaded onto the same factor.
- Factor 4 is to the variables that measure the ease of use of E-Dnevnik. This factor was extracted well since all four variables loaded onto the same factor.
- Factor 5 is to variables that measure the technological knowledge of teachers for using E-Dnevnik. This factor was extracted well since all five variables loaded onto the same factor.
- Factor 6 is related to the variables that measure the pressure from parents to teachers on using E-Dnevnik. This factor was extracted well since all four variables loaded onto the same factor.
- Factor 7 is related to the variables that measure the post adoption phase of E-Dnevnik. This factor was not extracted well since variable 4 and 5 were loaded on more than one factor. We had to remove those two variables in order for factor 6 to be extracted well.

- Factor 8 is related to the variables that measure the governmental cooperation for E-Dnevnik. This factor was not extracted well since variable 2 was loaded on more than one factor. We had to remove this variable in order for factor 7 to be extracted well.
- Factor 9 is related to the variables that measure the complexity of E-Dnevnik. This factor was not extracted well since variable 1 and 5 were loaded on more than one factor. We had to remove those two variables in order for factor 8 to be extracted well.
- Factor 10 is related to the variables that measure the compatibility of E-Dnevnik. This factor was not extracted well since variable 4 and 5 were loaded on more than one factor. We had to remove those two variables in order for factor 9 to be extracted well.

4.3 Reliability Analysis

Doing factor analysis or even other analysis like descriptive analysis or regression analysis, etc. would take a lot of effort and time, but none of it would matter if the results are not reliable. It would be same as if we are measuring a person's weight and one moment it would show 65kg and the other moment it would show 75kg. In this case we are dealing with an unreliable weight measuring instrument, so we are not taking into consideration neither of the results.

Reliability could be assessed by different ways. In our research we are using the Cronbach's Alpha because it's flexibility in the application and measurement of data in a larger scale. Cronbach's Alpha happens to be also the most popular method of testing reliability.

The output of Cronbach's Alpha analysis is calculated based on the number of the questions in the questionnaire (N of Items) and the average inter-item correlation. The maximum value for Cronbach's Alpha reliability would be 1 and the maximum value for Cronbach's Alpha unreliability would be 0. As for the value that we need for measuring Chronbach's Alpha in a questionnaire for the measure to be reliable, there are debates where some statisticians say 0.7 and others say 0.8. On the other hand there are other statisticians who have made a scale and say that, 0.50 and below shows low reliability, 0.50 to 0.70 shows moderate reliability, 0.70 to 0.90 show high reliability and 0.90 and above shows excellent reliability.

Before EFA		After EFA	
Reliability Statistics		**Reliability Statistics**	
Cronbach's Alpha	N of Items	Cronbach's Alpha	N of Items
0,861	45	0,876	39

Table 6. Reliability Statistics- All variables vs only chosen

By observing the results from Table 6 we can see that the Cronbach's alpha value for all variables is 0.861. This indicates that the reliability that we have is very high.

Nevertheless, based on factor analysis we had to reduce the number of the variables from 45 to 39. With 6 variables less from the table 6 we can see that reliability has increased to 0.876. The most important thing here is that our reliability hasn't decreased when the number of variables decreased. Since 0.876 is between 0.7 and 0.9 we can say that we have a high reliability.

4.4 Descriptive Analysis

Descriptive Statistics provides us with accurate description of large data set quickly and easily. The descriptive statistics that we have used are: mean standard deviation, variance, skewness, and kurtosis (Hinton, Brownlow, McMurray, & Cozens, 2005).

The distribution of data can deviate from normal. There are two ways: skewness and kurtosis (Field, DISCOVERING STATISTICS USING SPSS, 2011).

By observing the skewness column we can measure the symmetry of the distribution of the data, where the normal distribution would have value of zero for skewness and be symmetric. According to (Brown, 2016) we can say that:

- We have a highly skewed distribution of data if skewness is less than -1 or greater than +1

- We have moderately skewed distribution of data if skewness is -1 and -0.5 or between 0.5 and +1.
- We have approximately skewness distribution of data if skewness is between -0.5 and 0.5.

By observing the kurtosis column in descriptive statistics table we can find how high the peak of the data is (peakedness) or what is the flatness of the distribution of the data (flatness). If the result of kurtosis is peak than most of the sample is very similar and if it is more flat then we have wide distribution of different subjects on our sample.

- When the kurtosis result is >3 it means that we have reached peakedness and it is called Leptokurtic.
- When the kurtosis result is =3 it means that we have normal results and it is called Mesokurtic
- When the kurtosis is <3 it means that we have reached flatness and it is called Platykurtic.

(Ntoumanis, 2005)

In Descriptive Analysis we are doing the Descriptive Statistics table two times, once for all the factor scores and once only for the selected factor scores.

Descriptive Statistics

	N	Mean	Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
U1	144	1.85	.709	.503	.456	.202	-.092	.401
U2	144	1.82	.686	.471	.644	.202	.750	.401
U3	144	1.76	.682	.465	1.153	.202	3.582	.401
U4	144	1.79	.635	.404	1.033	.202	4.263	.401
U5	144	1.88	.705	.496	.778	.202	1.231	.401
EoU1	144	2.42	1.113	1.238	.228	.202	-1.182	.401
EoU2	144	2.44	1.126	1.269	.262	.202	-1.220	.401
EoU3	144	2.35	1.105	1.221	.536	.202	-.747	.401
EoU4	144	2.26	1.206	1.454	.642	.202	-.875	.401

C1	144	3.78	.856	.733	-.435	.202	-.321	.401
C2	144	3.69	.948	.899	-.949	.202	.413	.401
C3	144	3.99	.857	.734	-1.069	.202	1.567	.401
C4	144	4.05	.847	.718	-1.142	.202	1.869	.401
Comp1	144	2.20	.866	.749	.384	.202	-.435	.401
Comp2	144	2.24	.778	.605	.360	.202	-.101	.401
Comp3	144	2.20	.715	.512	.380	.202	.200	.401
Comp4	144	2.01	.762	.580	1.143	.202	2.327	.401
Comp5	144	2.31	.823	.678	.429	.202	-.229	.401
TK1	144	2.09	.793	.628	.692	.202	.430	.401
TK2	144	2.31	.933	.871	.399	.202	-.650	.401
TK3	144	2.26	.828	.685	.222	.202	-.460	.401
TK4	144	1.93	.716	.513	.798	.202	1.247	.401
B1	144	1.99	.748	.559	.328	.202	-.336	.401
B2	144	1.78	.628	.394	.712	.202	1.843	.401
B3	144	1.81	.625	.391	.505	.202	1.039	.401
B4	144	1.78	.684	.468	1.644	.202	6.527	.401
B5	144	1.94	.786	.618	.898	.202	1.404	.401
PfP1	144	2.78	1.005	1.009	.109	.202	-1.145	.401
PfP2	144	2.58	1.007	1.014	.206	.202	-.992	.401
PfP3	144	2.48	.900	.811	.296	.202	-.454	.401
PfP4	144	2.33	.981	.963	.520	.202	-.538	.401
GC1	144	1.76	.579	.335	.287	.202	.756	.401
GC2	144	2.04	.590	.348	.199	.202	.582	.401
GC3	144	2.04	.590	.348	.199	.202	.582	.401
GC4	144	1.94	.594	.353	.423	.202	1.446	.401
GC5	144	1.90	.600	.360	.238	.202	.580	.401
EICTS1	144	2.82	.906	.820	.195	.202	-.662	.401
EICTS2	144	2.57	.987	.974	.335	.202	-.756	.401
EICTS3	144	2.74	.982	.965	.149	.202	-.975	.401
EICTS4	144	2.78	.993	.985	.199	.202	-1.003	.401
PA1	144	3.67	.868	.753	-.744	.202	-.143	.401
PA2	144	3.20	.905	.819	-.353	.202	-1.065	.401
PA3	144	2.99	.901	.811	-.031	.202	-1.116	.401
PA4	144	2.03	.663	.439	.547	.202	.995	.401
PA5	144	1.58	.620	.385	.927	.202	1.585	.401
Valid N (listwise)	144							

Table 7. Factor Scores Descriptive Statistics ALL

In the Table 7 we have the results for descriptive statistics for all the variables. By observing the skewness column we can measure the symmetry of the distribution of our data. In our case we have approximately skewness which is a very good result because it means that our data set is approximately symmetric (Ntoumanis, 2005).

In the same table from the Kurtosis column we can explain if the data distribution is too peak, too flatter or normal. By observing the results in this column we can see that most of the kurtosis value are lower than 3 and that we have platykurtic. This means that the data set has flatness and that we have wide distribution on our data set (Ntoumanis, 2005).

Descriptive Statistics

	N	Mean	Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Use_12345	144	9.1042	2.84007	8.066	.842	.202	3.084	.401
EoU_1234	144	9.4653	4.18775	17.537	.422	.202	-1.038	.401
Benefits_12345	144	9.2986	2.92584	8.561	.730	.202	1.989	.401
EICTS_1234	144	10.9028	3.56620	12.718	.292	.202	-.792	.401
Comp_123	144	6.6458	1.91596	3.671	.354	.202	.330	.401
TK_1234	144	8.5903	2.74413	7.530	.361	.202	.377	.401
GC_1345	144	7.6389	1.69578	2.876	.826	.202	4.124	.401
PfP	144	10.1736	2.99960	8.998	.182	.202	-.538	.401
C_234	144	11.7361	2.08889	4.363	-1.440	.202	3.864	.401
PA_123	144	9.8611	2.13401	4.554	-.342	.202	-.395	.401
Valid N (listwise)	144							

Table 8. Descriptive Statistics- Factor Scores

In Table 8 we have the results for descriptive statistics for all the variables. By observing the skewness column we can measure the symmetry of the distribution of our data. In our case we have approximately skewness which is a very good result because it means that our data set is approximately symmetric (Ntoumanis, 2005).

In the same table from the Kurtosis column we can explain if the data distribution is too peak, too flatter or normal. By observing the results in this column we can see that most of the kurtosis value are lower than 3 and that we have platykurtic. This means that the data set has flatness and that we have wide distribution on our data set (Ntoumanis, 2005).

Statistics

		Use_12345	EoU_1234	Benefits_12345	EICTS_1234	Comp_123	TK_1234	GC_1345	PfP	C_234	PA_123
N	Valid	144	144	144	144	144	144	144	144	144	144
	Missing	26	26	26	26	26	26	26	26	26	26
Mean		9.1042	9.4653	9.2986	10.9028	6.6458	8.5903	7.6389	10.1736	11.7361	9.8611
Std. Error of Mean		.23667	.34898	.24382	.29718	.15966	.22868	.14132	.24997	.17407	.17783
Std. Deviation		2.84007	4.18775	2.92584	3.56620	1.91596	2.74413	1.69578	2.99960	2.08889	2.13401

Table 9. Descriptive Analysis – Frequencies

From observing Table 9 we can see that most of skewness value are between 0.5 and +1 and it means that we have approximate skewness which is a good result because it means that our data set is approximately symmetric. As for kurtosis we can see that most of values are below 3 which is not a very good result since it means there is flatness in our data set (Ntoumanis, 2005).

In the Correlation table we have information about the Pearson correlation of every pair of variables, the significance or the probability value and the number of the participants (Hinton, Brownlow, McMurray, & Cozens, 2005).

Correlations

The following table contains correlations between all factors/variables.

Correlations

	Use_12345	EoU_1234	Benefits_12345	EICTS_1234	Comp_123	TK_1234	GC_1345	PfP	C_234	PA_123	PA5

Use_12345	Pearson Correlation	1	,296**	,466**	,243**	,376**	,178*	,321**	,087	-,208)*	,049	,295**
	Sig. (2-tailed)		,000	,000	,003	,000	,033	,000	,298	,013	,563	,000
	N	144	144	144	144	144	144	144	144	144	144	144
EoU_1234	Pearson Correlation	,296**	1	,240**	,116	,393**	,190*	,173*	-,028)	-,099)	,161	,212*
	Sig. (2-tailed)	,000		,004	,167	,000	,022	,039	,742	,236	,053	,011
	N	144	144	144	144	144	144	144	144	144	144	144
Benefits_12345	Pearson Correlation	,466**	,240**	1	,154	,439**	,516**	,455**	,046	-,294)**	,056	,497**
	Sig. (2-tailed)	,000	,004		,065	,000	,000	,000	,585	,000	,505	,000
	N	144	144	144	144	144	144	144	144	144	144	144
EICTS_1234	Pearson Correlation	,243**	,116	,154	1	,433**	,133	,194*	,395**	,099	,357**	,127
	Sig. (2-tailed)	,003	,167	,065		,000	,112	,020	,000	,238	,000	,129
	N	144	144	144	144	144	144	144	144	144	144	144
Comp_123	Pearson Correlation	,376**	,393**	,439**	,433**	1	,404**	,277**	,059	-,036)	,262**	,316**
	Sig. (2-tailed)	,000	,000	,000	,000		,000	,001	,479	,671	,002	,000
	N	144	144	144	144	144	144	144	144	144	144	144
TK_1234	Pearson Correlation	,178*	,190*	,516**	,133	,404**	1	,411**	-,013)	-,130)	,229**	,380**

	Sig. (2-tailed)	,033	,022	,000	,112	,000		,000	,881	,120	,006	,000
	N	144	144	144	144	144	144	144	144	144	144	144
GC_1345	Pearson Correlation	,321**	,173*	,455**	,194*	,277**	,411**	1	,162	-,260)**	,096	,308**
	Sig. (2-tailed)	,000	,039	,000	,020	,001	,000		,052	,002	,251	,000
	N	144	144	144	144	144	144	144	144	144	144	144
PfP	Pearson Correlation	,087	-,028)	,046	,395**	,059	-,013)	,162	1	-,095)	,149	,148
	Sig. (2-tailed)	,298	,742	,585	,000	,479	,881	,052		,256	,075	,076
	N	144	144	144	144	144	144	144	144	144	144	144
C_234	Pearson Correlation	-,208)*	-,099)	-,294)**	,099	-,036)	-,130)	-,260)**	-,095)	1	,152	-,231)**
	Sig. (2-tailed)	,013	,236	,000	,238	,671	,120	,002	,256		,069	,005
	N	144	144	144	144	144	144	144	144	144	144	144
PA_123	Pearson Correlation	,049	,161	,056	,357**	,262**	,229**	,096	,149	,152	1	,030
	Sig. (2-tailed)	,563	,053	,505	,000	,002	,006	,251	,075	,069		,722
	N	144	144	144	144	144	144	144	144	144	144	144
PA5	Pearson Correlation	,295**	,212*	,497**	,127	,316**	,380**	,308**	,148	-,231)**	,030	1
	Sig. (2-tailed)	,000	,011	,000	,129	,000	,000	,000	,076	,005	,722	
	N	144	144	144	144	144	144	144	144	144	144	144

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 10. Correlations

By observing Table 10 we can see if there is a correlation between a given pair of variables based on Pearson correlation and probability value. According to Table 10 explanation, based on Pearson Correlation, a correlation is significant at 0.01 level and based on probability value a correlation is significant at 0.05 level.

Significant correlations

1. Independent variables to Benefits

a. TK_1234 to Benefits

For this factors we can see that Pearson coefficient is 0.516. From the ** we can see that SPSS indicates that this correlation is significant at 0.01 level. The p value is 0.000. This results indicate that as the Technological Knowledge increases the Benefits will also increase, which is a positive correlation. Since r value is positive and $p<0.01$ we can say that we have a positive correlation and these two variables and the null hypothesis that there is no association between two variables is rejected.

b. Use_12345 to Benefits

For this factors we can see that Pearson coefficient is 0.466. From the ** we can see that SPSS indicates that this correlation is significant at 0.01 level. The p value is 0.000. These results indicate that as the Usefulness increases the Benefits will also increase, which is a positive correlation. Since r value is positive and $p<0.01$ we can say that we have a positive correlation and these two variables and the null hypothesis is rejected.

c. GC_1345 to Benefits

For this factors we can see that Pearson coefficient is 0.455. From the ** we can see that SPSS indicates that this correlation is significant at 0.01 level. The p value is 0.000. These results indicate that as the Governmental Cooperation increases the Benefits will also increase, which is a positive correlation. Since r value is positive and $p<0.01$ we can say that we have a positive correlation and these two variables and the null hypothesis is rejected.

d. C_234 to Benefits

For this factors we can see that Pearson coefficient is -294. From the ** we can see that SPSS indicates that this correlation is significant at 0.01 level. The p value is 0.000. These results indicate that as the Complexity increases the Benefits will decrease, which is a negative correlation. Since r value is positive and $p<0.01$ we can say that we have a positive correlation and these two variables and the null hypothesis is rejected.

e. Comp_123 to Benefits

For this factors we can see that Pearson coefficient is 0.439. From the ** we can see that SPSS indicates that this correlation is significant at 0.01 level. The p value is 0.000. These results indicate that as the Compatibility increases the Benefits will also increase, which is a positive correlation. Since r value is positive and $p<0.01$ we can say that we have a positive correlation and these two variables and the null hypothesis is rejected.

2. Independent variables to Adoption_123

a. EICTS_1234 to Adoption_123

For this factors we can see that Pearson coefficient is 0.357. From the ** we can see that SPSS indicates that this correlation is significant at 0.01 level. The p value is 0.000. These results indicate that as the External ICT Support increases the Adoption_123 will also increase, which is a positive correlation. Since r value is positive and $p<0.01$ we can say that we have a positive correlation and these two variables and the null hypothesis is rejected.

b. TK_1234 to Adoption_123

For this factors we can see that Pearson coefficient is 0.229. From the ** we can see that SPSS indicates that this correlation is significant at 0.01 level. The p value is 0.000. These results indicate that as the Technological Knowledge increases the Adoption_123 will also increase, which is a positive correlation. Since r value is positive and $p<0.01$ we can say that we have a positive correlation and these two variables and the null hypothesis is rejected.

3. Independent variables to Adopt_5

Since we don't have the correlation of PA5 with its independent variables we created Table 11 in SPSS with the necessary data.

		Benefits_12345	TK_1234	PA5
Benefits_12345	Pearson Correlation	1	.516**	.497**
	Sig. (2-tailed)		.000	.000
	N	144	144	144
TK_1234	Pearson Correlation	.516**	1	.380**
	Sig. (2-tailed)	.000		.000
	N	144	144	144
PA5	Pearson Correlation	.497**	.380**	1
	Sig. (2-tailed)	.000	.000	
	N	144	144	144

**. Correlation is significant at the 0.01 level (2-tailed).

Table 11. Correlation

a. TK_1234 to Adoption_5

For this factors we can see that Pearson coefficient is 0.380. From the ** we can see that SPSS indicates that this correlation is significant at 0.01 level. The p value is 0.000. These results indicate that as the Technological Knowledge increases, the Adoption_5 will also increase, which is a positive correlation. Since r value is positive and $p<0.01$ we can say that we have a positive correlation and these two variables and the null hypothesis is rejected.

b. Benefits_12345 to Adoption_5

For this factors we can see that Pearson coefficient is 0.497. From the ** we can see that SPSS indicates that this correlation is significant at 0.01 level. The p value is 0.000. These results indicate that as the Benefits increases the Adoption_5 will also increase, which is a positive correlation. Since r value is positive and $p<0.01$ we can say that we have a positive correlation and these two variables and the null hypothesis is rejected.

4.5 Regression Analysis

In this research study we are doing multiple regression analysis. In order to do multiple regression analysis we have to divide variables in dependent variable which is also called as criterion variable and independent variables which are also called as predictor variables (Hinton, Brownlow, McMurray, & Cozens, 2005).

Multiple regression when compared with single regression is more complex since it has more than one independent variable as predictors for the dependent variable (Hinton, Brownlow, McMurray, & Cozens, 2005).

In order to do regression analysis we are going to use stepwise method which is different from the enter method. This method is adding only predictor variables in the output and doesn't show the independent variables that correlate the least.

The regression model we will use is:

$$Y = B_1 + B_2 X_1 + B_3 X_2 + u_i$$

Y- Represents the dependent variable. In our case the dependent variable is Benefits.

X- Represents the independent variable. This variable is the one which is thought to have a considerable impact on the dependent one. We have five independent variables X_1 is Technological Knowledge, X_2 is Usefulness, X_3 is Governmental Cooperation, X_4 is Complexity and X_5 is Compatibility.

U_i- Is the stochastic variable or error term. Represents all unobservable factors, that indicate on the results of the dependent variable. It is an unobservable variable which can have positive and negative values.

We have done three times the regression analysis, since we have used different variables as dependent and independents one.

- In the first analysis we have put the variable Benefits_12345 as the dependent variable and all the other variables as independent. But since we are using the stepwise method only some of the variables will be selected as statistically significant independent variables.
- In the second analysis we have put the variable PA_5 as the dependent variable and all the other variables as independent. But since we are using the stepwise method only some of the variables will be selected as statistically significant independent variables.

- In the third analysis we have put the variable PA_123 as the dependent variable and all the other variables as independent. But since we are using the stepwise method only some of the variables will be selected as statistically significant independent variables.

ALL TO BENEFITS

First we did regression analysis with Benefits_12345 as the dependent variable and TK_1234, Use_12345, GC_1345, C_234 and Comp_123 as the independent variables.

The table of Variable Entered/Removed lets us know which are the independent variables that are predictors for the independent variable (Hinton, Brownlow, McMurray, & Cozens, 2005).

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	TK_1234	.	Stepwise (Criteria: Probability-of-F-to-enter <= ,050, Probability-of-F-to-remove >= ,100).
2	Use_12345	.	Stepwise (Criteria: Probability-of-F-to-enter <= ,050, Probability-of-F-to-remove >= ,100).
3	GC_1345	.	Stepwise (Criteria: Probability-of-F-to-enter <= ,050, Probability-of-F-to-remove >= ,100).
4	C_234	.	Stepwise (Criteria: Probability-of-F-to-enter <= ,050, Probability-of-F-to-remove >= ,100).
5	Comp_123	.	Stepwise (Criteria: Probability-of-F-to-enter <= ,050, Probability-of-F-to-remove >= ,100).

a. Dependent Variable: Benefits_12345

Table 12. All to Benefits

By observing the table 12 we can see that the independent variables that are chosen by using the stepwise method are: Technology Knowledge, Usefulness, Governmental Cooperation, Complexity and Compatibility. These variables are the only variables that are significantly correlated with Benefits which is the dependent variable.

Model Summary is the second table on the regression analysis output. Since we have five independent variables, five models have been produced. The R Square column shows for each variable the amount of the variance in the dependent variable they can explain.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,516[a]	,266	,261	2,51477
2	,641[b]	,411	,403	2,26154
3	,662[c]	,439	,427	2,21516
4	,675[d]	,456	,440	2,18906
5	,689[e]	,475	,456	2,15812

a. Predictors: (Constant), TK_1234

b. Predictors: (Constant), TK_1234, Use_12345

c. Predictors: (Constant), TK_1234, Use_12345, GC_1345

d. Predictors: (Constant), TK_1234, Use_12345, GC_1345, C_234

e. Predictors: (Constant), TK_1234, Use_12345, GC_1345, C_234, Comp_123

Table 12. All to Benefits- Model Summary

By observing table 13 we can see that:

- The first independent variable which is Technology Knowledge (all questions) can explain 0.261*100%=26.1% of the variance for the dependent variable Benefits (all questions);
- The second independent variable which is Usefulness (all questions) can explain 0.403-0.261=0.175; 0.142*100%=14.2 % of the variance for the dependent variable Benefits (all questions);
- The third independent variable which is Governmental Cooperation (only question 1,3,4 and 5) can explain 0.427-0.403=0.024; 0.024*100% =2.4% of the variance for the dependent variable Benefits (all questions);
- The fourth independent variable which is Complexity (only questions: 2,3 and 4) can explain 0.440-0.427=0.013; 0.013*100%=1.3% of the variance for the dependent variable Benefits (all questions);

- The fifth independent variable which is Compatibility (only questions 1,2 and 3) can explain 0.456-0.440= 0.016; 0.016*100%=1.6% of the variance for the dependent variable Benefits (all questions).

The ANOVA table tests the significance of the regression model. Since we are using the stepwise method, there is produced an ANOVA for each model. This table serves to test the significance of each model, in order to see if there is explained a significant amount of the variance of the dependent variable by the independent variables.

In this table the Sig. column determines if our independent variables are good predictors or not. The alpha value for Sig is 0.05, so any p value which is lower than 0.05 would be considered as a good predictor. The values for the Mean Square column can be calculated by dividing the values on the Sum of Squares with the degree of freedom values for each variable. Mean Square is the amount of variance. The Sums of Squares gives a measure of the variability in the scores due to a particular source of variability. F value shows the significance of our factor (p=0.000) , the higher the F value the more likely that are real effects.

There are already existing tables from which the F value of our table has to be compared. If our value is higher from the value of those tables then there are good results.

ANOVA[f]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	326,140	1	326,140	51,571	,000[a]
	Residual	898,020	142	6,324		
	Total	1224,160	143			
2	Regression	503,007	2	251,504	49,174	,000[b]
	Residual	721,152	141	5,115		
	Total	1224,160	143			
3	Regression	537,186	3	179,062	36,491	,000[c]
	Residual	686,974	140	4,907		
	Total	1224,160	143			
4	Regression	558,074	4	139,518	29,115	,000[d]
	Residual	666,086	139	4,792		

	Total	1224,160	143			
5	Regression	581,428	5	116,286	24,967	,000[e]
	Residual	642,732	138	4,657		
	Total	1224,160	143			

a. Predictors: (Constant), TK_1234

b. Predictors: (Constant), TK_1234, Use_12345

c. Predictors: (Constant), TK_1234, Use_12345, GC_1345

d. Predictors: (Constant), TK_1234, Use_12345, GC_1345, C_234

e. Predictors: (Constant), TK_1234, Use_12345, GC_1345, C_234, Comp_123

f. Dependent Variable: Benefits_12345

Table 13. All to Benefits- ANOVA

By observing Table 14 we can see that:

- The first independent variable which is Technology Knowledge (all questions) is a good predictor since its Sig. value is 0.000 which is lower than 0.05 (0.000<0.05). The F value is F(1,142)=51.571. From the obtained results we can conclude that the effects would be statistically significant.
- The second independent variable which is Usefulness (all questions) is a good predictor since its Sig. value is 0.000 which is lower than 0.05 (0.000<0.05). The F value is F(2,141)= 49.174. From the obtained results we can conclude that the effects would be statistically significant.
- The third independent variable which is Governmental Cooperation (only questions 1, 3,4 and 5) is a good predictor since its Sig. value is 0.000 which is lower than 0.05 (0.000<0.05). The F value is F(3,140)=36.491. From the obtained results we can conclude that the effects would be statistically significant.
- The fourth independent variable which is Complexity (only questions 2,3 and 4) is a good predictor since its Sig. value is 0.000 which is lower than 0.05 (0.000<0.05). The F value is F(4,139)=29.115. From the obtained results we can conclude that the effects would be statistically significant.
- The fifth independent variable which is Compatibility (only questions 1, 2 and 3) is a good predictor since its Sig. value is 0.000 which is lower than 0.05 (0.000<0.05). The F

value is F(5,138)= 24.967. From the obtained results we can conclude that the effects would be statistically significant.

Coefficients Table is the next table which gives us the regression equation, it shows us the most individually predictor variables for the dependent variable. Since we are using the stepwise method we will be able to see only the selected variables for the final model.

From the Unstandardized Coefficients B, for each model, we can understand the coefficients of the independent variables of the regression equation. Standardized Coefficient Beta gives us the information about how much contribution each independent variable is making for the model. T tests are performed for confirming if beta value is significantly higher or lower than zero. Which can help us to investigate furthermore if the given predictors are significant or not. Sig. column in the Coefficients table informs about the significance of each model.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4,571	,691		6,616	,000
	TK_1234	,550	,077	,516	7,181	,000
2	(Constant)	1,577	,803		1,964	,052
	TK_1234	,477	,070	,447	6,813	,000
	Use_12345	,398	,068	,386	5,881	,000
3	(Constant)	,161	,952		,169	,866
	TK_1234	,403	,074	,378	5,430	,000
	Use_12345	,348	,069	,337	5,038	,000
	GC_1345	,329	,125	,191	2,639	,009
4	(Constant)	2,980	1,646		1,811	,072
	TK_1234	,400	,073	,375	5,454	,000
	Use_12345	,328	,069	,319	4,771	,000
	GC_1345	,280	,125	,162	2,234	,027
	C_234	-,191)	,092	-,137)	-2,088)	,039
5	(Constant)	2,680	1,628		1,646	,102
	TK_1234	,342	,077	,321	4,460	,000
	Use_12345	,276	,072	,268	3,845	,000

	GC_1345	,263	,124	,153	2,125	,035
	C_234	-,211)	,091	-,151)	-2,329)	,021
	Comp_123	,246	,110	,161	2,239	,027

Table 14. All to Benefits- Coefficients

By observing the results on table 15 we can see that:

- Unstandardized Coefficients B:

Model 1:

Benefits= 4.571 + 0.550TK_1234+ U_i

From the regression results of Model1 we can say that an increase of the Technological Knowledge for 1 unit on average would increase the Benefits for 0.550% .

Model2:

Benefits= 1.577 + 0.477TK_1234 + 0.398Use_12345+ Ui

From the regression results of Model2 we can say that: an increase of the Technological Knowledge for 1unit on average would increase the Benefits for 0.477% ; an increase of the Usefulness for 1unit on average would increase the Benefits for 0.398%.

Model3:

Benefits=0.161 + 0.403TK_1234 + 0.348Use_12345 + 0.329GC1345+ Ui

From the regression results of Model2 we can say that: an increase of the Technological Knowledge for 1unit on average would increase the Benefits for 0.403% ; an increase of the Usefulness for 1 unit on average would increase the Benefits for 0.348%; an increase of the Governmental Cooperation for 1% on average would increase the Benefits for 0.329%.

Model4:

Benefits= 2.980 + 0.400TK_1234 +0.328Use_12345 + 0.280GC_1345 + (-0.191C_234)+ Ui

From the regression results of Model2 we can say that: an increase of the Technological Knowledge for 1unit on average would increase the Benefits for 0.400% ; an increase of the Usefulness for 1unit on average would increase the Benefits for 0.328%; an increase of the Governmental Cooperation for 1unit on average would increase the Benefits for 0.280%; an increase of the Complexity for 1unit on average would increase the Benefits for 0.191%.

Model5:

Benefits= 2.680 + 0.342TK_1234 +0.276Use_12345 + 0.263GC_1345 + (-0.211C_234 + 0.246Comp_123)+ Ui

From the regression results of Model2 we can say that: an increase of the Technological Knowledge for 1unit on average would increase the Benefits for 0.342% ; an increase of the Usefulness for 1unit on average would increase the Benefits for 0.276%; an increase of the Governmental Cooperation for 1unit on average would increase the Benefits for 0.263%; an increase of the Complexity for 1unit on average would increase the Benefits for 0.211%; an increase of Compatibility for 1unit on average would increase the Benefits for 0.246%.

Taking into consideration that standard error has small values for every variable on each model we can say that the independent variables have significant influence on the dependent variable.

- Standardized Coefficient Beta:

From the results we can see what contribution each independent variable is making on each model. For example in model5 the independent variable with the highest contribution is TK_1234 (Technological Knowledge, all questions).

Note: we do not interpret the results of t statistics since they have to be compared with the t critical value from the statistics book.

By observing the values from the Sig. column we can see that the best model do be used would be the fifth one since all the p values for all the independent variables are significant ($p<0.05$).

ALL TO POST ADOPTION- VARIABLE 5

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method

1	Benefits_12345	.	Stepwise (Criteria: Probability-of-F-to-enter <= ,050, Probability-of-F-to-remove >= ,100).
2	TK_1234	.	Stepwise (Criteria: Probability-of-F-to-enter <= ,050, Probability-of-F-to-remove >= ,100).

a. Dependent Variable: PA5

Table 15. All to Post Adoption Variable 5- Variables Entered/Removed

By observing Table 16 we can see that the independent variables that are chosen by using the stepwise method are: Benefits and Technology Knowledge. These variables are the only variables that are significantly correlated with Post Adoption 5(question 5) which is the dependent variable.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,497[a]	,247	,242	,540
2	,517[b]	,268	,257	,535

a. Predictors: (Constant), Benefits_12345

b. Predictors: (Constant), Benefits_12345, TK_1234

Table 16. All to Post Adoption Variable 5- Model Summary

By observing table 17 we can see that

- The first independent variable which is Benefits (all questions) can explain 0.242*100%=24.2% of the variance for the dependent variable Post Adoption 5 (only l question 5).

- The second independent variable which is Technology Knowledge (all questions) can explain 0.257-0.242= 0.15; 0.15*100%=1.5% of the variance for the dependent variable Post Adoption 5 (only question 5).

ANOVA[c]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	13,576	1	13,576	46,539	,000[a]
	Residual	41,424	142	,292		
	Total	55,000	143			
2	Regression	14,716	2	7,358	25,755	,000[b]
	Residual	40,284	141	,286		
	Total	55,000	143			

a. Predictors: (Constant), Benefits_12345

b. Predictors: (Constant), Benefits_12345, TK_1234

c. Dependent Variable: PA5

Table 17. All to Post Adoption Variable 5- ANOVA

By observing table 18 we can see that

- The first independent variable which is Benefits (all questions) is a good predictor since its Sig. value is 0.000 which is lower than 0.05 (0.000<0.05). The F value is F(1,142)=46.539. From the obtained results we can conclude that the effects would be statistically significant.
- The second independent variable which is Technology Knowledge (all questions) is a good predictor since its Sig. value is 0.000 which is lower than 0.05 (0.000<0.05). The F value is F(2,141)= 25.755. From the obtained results we can conclude that the effects would be statistically significant.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,604	,150		4,016	,000
	Benefits_12345	,105	,015	,497	6,822	,000
2	(Constant)	,449	,168		2,672	,008

	Benefits_12345	,087	,018	,410	4,873	,000
	TK_1234	,038	,019	,168	1,997	,048

a. Dependent Variable: PA5

Table 18. All to Post Adoption Variable 5- Coefficients

By observing the results on table 19 we can see that:

- Unstandardized Coefficients B:

  Model 1: PA5= 0.604 + 0.105Benefits_12345+ U_i

  From the regression results of Model1 we can say that an increase of the Benefits for 1% on average would increase the PA5 for 0.105%.

  Model2: PA5= 0.449+ 0.087Benefits_12345 + 0.038TK_1234 + U_i

  From the regression results of Model2 we can say that: an increase of the Benefits for 1% on average would increase the PA5 for 0.087%; an increase of the Technological Knowledge for 1% on average would increase the PA5 for 0.038%.

  Taking into consideration that standard error has small values for every variable on both model we can say that the independent variables have significant influence on the dependent variable.

- Standardized Coefficient Beta:

  From the results we can see what contribution each independent variable is making on each model. For example on model2 the independent variable with the highest contribution is Benefits_12345 (Benefits, all questions).

  Note: we do not interpret the results of t statistics since they have to be compared with the t critical value from the statistics book.

- By observing the values from the Sig. column we can see that the best model to be used would be the second one since all the p values for all the independent variables are significant ($p<0.05$).

ALL TO POST ADOPTION- VARIABLE 1,2, 3 (SHOOL ORIENTED)

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	EICTS_1234	.	Stepwise (Criteria: Probability-of-F-to-enter <= ,050, Probability-of-F-to-remove >= ,100).
2	TK_1234	.	Stepwise (Criteria: Probability-of-F-to-enter <= ,050, Probability-of-F-to-remove >= ,100).

a. Dependent Variable: PA_123

Table 19. All to Post Adoption Variable 1,2,3- Variables Entered/Removed

By observing the table 20 we can see that the independent variables that are chosen by using the stepwise method are: External ICT Support and Technological Knowledge. These variables are the only variables that are significantly correlated with Benefits which is the dependent variable.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,357[a]	,127	,121	2,00074
2	,401[b]	,161	,149	1,96884

a. Predictors: (Constant), EICTS_1234

b. Predictors: (Constant), EICTS_1234, TK_1234

Table 20. All to Post Adoption Variable 1,2,3- Model Summary

By observing table 21 we can see that

- The first independent variable which is External ICT Support (all questions) can explain 0.121*100%=12.1% of the variance for the dependent variable Post Adoption 123 (only questions 1, 2 and 3).
- The second independent variable which is Technology Knowledge (all questions) can explain 0149-0.121=0.028; 0.028*100%=2.8% of the variance for the dependent variable Post Adoption 123 (only questions 1,2 and 3).

ANOVA[c]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	82,802	1	82,802	20,685	,000[a]
	Residual	568,420	142	4,003		
	Total	651,222	143			
2	Regression	104,662	2	52,331	13,500	,000[b]
	Residual	546,560	141	3,876		
	Total	651,222	143			

a. Predictors: (Constant), EICTS_1234

b. Predictors: (Constant), EICTS_1234, TK_1234

c. Dependent Variable: PA_123

Table 21. All to Post Adoption Variable 1,2,3- ANOVA

By observing table 22 we can see that

- The first independent variable which is Benefits (all questions) is a good predictor since its Sig. value is 0.000 which is lower than 0.05 (0.000<0.05). The F value is F(1,142)=20.685. From the obtained results we can conclude that the effects would be statistically significant.
- The second independent variable which is Technology Knowledge (all questions) is a good predictor since its Sig. value is 0.000 which is lower than 0.05 (0.000<0.05). The F value is F(2,141)= 13.500. From the obtained results we can conclude that the effects would be statistically significant.

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.

1	(Constant)	7,535	,538		14,005	,000
	EICTS_1234	,213	,047	,357	4,548	,000
2	(Constant)	6,460	,696		9,277	,000
	EICTS_1234	,199	,047	,332	4,265	,000
	TK_1234	,144	,061	,185	2,375	,019

a. Dependent Variable: PA_123

Table 22. Coefficients

By observing the results on table 23 we can see that:

- Unstandardized Coefficients B:

  Model 1: PA_123= 7.535 + 0.213EICTS_1234+ U_i

  From the regression results of Model1 we can say that an increase of the Benefits for 1% on average would increase the PA_123 for 0.213%.

  Model2: PA_123= 6.460+ 0.199 EICTS_1234+ 0.144TK_1234 + U_i

  From the regression results of Model2 we can say that: an increase of the Benefits for 1% on average would increase the PA_123 for 0.199%; an increase of the Technological Knowledge for 1% on average would increase the PA_123 for 0.144%.

  Taking into consideration that standard error has small values for every variable on both model we can say that the independent variables have significant influence on the dependent variable.

- Standardized Coefficient Beta:

  From the results we can see what contribution each independent variable is making on each model. For example on model2 the independent variable with the highest contribution is External ICT Support (EICTS, all questions).

  Note: we do not interpret the results of t statistics since they have to be compared with the t critical value from the statistics book.

- By observing the values from the Sig. column we can see that the best model to be used would be the second one since all the p values for all the independent variables are significant ($p<0.05$).

The Excluded Variable table contains all the variables that are excluded when doing the stepwise regression analysis. When they are excluded in this table you can see their Beta In value, t value and significance value.

Beta in provides us with the information of the significance this variable would hav it it was included in the regression analysis output models.

The t column also provides us with the probability values of each independent variable.

Sig. Column provides us with the significance value each variable has.

Partial Correlation provides us with the value of the indication each variable would have if we put them back in the model.

Collinearity Statistics provides us with the information about collinearity in our data. As a rule of thumb is that any collinearity above 0.1 would cause big problems (Hinton, Brownlow, McMurray, & Cozens, 2005).

Excluded Variables[c]

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
1	Use_12345	-,040)[a]	-,498)	,619	-,042)	,941
	EoU_1234	,122[a]	1,550	,123	,129	,987
	Comp_123	,132[a]	1,523	,130	,127	,813
	TK_1234	,185[a]	2,375	,019	,196	,982
	GC_1345	,028[a]	,349	,727	,029	,962
	PfP	,010[a]	,113	,910	,010	,844
	C_234	,118[a]	1,500	,136	,125	,990
	Benefits_12345	,001[a]	,012	,990	,001	,976
2	Use_12345	-,071)[b]	-,876)	,382	-,074)	,920
	EoU_1234	,092[b]	1,166	,246	,098	,955
	Comp_123	,062[b]	,670	,504	,057	,690
	GC_1345	-,055)[b]	-,636)	,526	-,054)	,811
	PfP	,024[b]	,285	,776	,024	,840
	C_234	,147[b]	1,899	,060	,158	,969
	Benefits_12345	-,125)[b]	-1,383)	,169	-,116)	,726

a. Predictors in the Model: (Constant), EICTS_1234

b. Predictors in the Model: (Constant), EICTS_1234, TK_1234

Excluded Variables[c]

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
1	Use_12345	-,040)[a]	-,498)	,619	-,042)	,941
	EoU_1234	,122[a]	1,550	,123	,129	,987
	Comp_123	,132[a]	1,523	,130	,127	,813
	TK_1234	,185[a]	2,375	,019	,196	,982
	GC_1345	,028[a]	,349	,727	,029	,962
	PfP	,010[a]	,113	,910	,010	,844
	C_234	,118[a]	1,500	,136	,125	,990
	Benefits_12345	,001[a]	,012	,990	,001	,976
2	Use_12345	-,071)[b]	-,876)	,382	-,074)	,920
	EoU_1234	,092[b]	1,166	,246	,098	,955
	Comp_123	,062[b]	,670	,504	,057	,690
	GC_1345	-,055)[b]	-,636)	,526	-,054)	,811
	PfP	,024[b]	,285	,776	,024	,840
	C_234	,147[b]	1,899	,060	,158	,969
	Benefits_12345	-,125)[b]	-1,383)	,169	-,116)	,726

a. Predictors in the Model: (Constant), EICTS_1234

b. Predictors in the Model: (Constant), EICTS_1234, TK_1234

c. Dependent Variable: PA_123

Table 23. All to Post Adoption Variable 1,2,3- Excluded Variables

By observing the results of table 24 we are able to see the independent variable that are not having a significant indication in the dependent variable of the model. If we see in detail we would be able to notice that each of the variables that is in this table is statistically insignificant to be part of the model and also has a very high collinearity (Hinton, Brownlow, McMurray, & Cozens, 2005).

4.6 Final Results

Based on the results that we have gained from the SPSS analysis some of the hypotheses are going to be accepted and some others are going to be rejected.

Accepted hypothesis are: H1(a), H3(a,) H4(a), H5(abc), H6(c), H8(a) and H9(b)

Rejected hypothesis are: H1(bc), H2(abc), H3(bc), H4(bc), H6(ab), H7(abc), H8(bc) and H9(ac)

5 DISCUSSION

In this chapter we are developing analytic and critical thinking, on gained results, referenced from theoretical arguments found in the literature review. Each hypothesis is analyzed and the results are compared with the literature review, to find similarities and differences.

Limitation and Future Research are to additional parts that are included in this section. Through them we are going to present relevant limitation for our study and guidelines on further elaboration on this study.

5.1 Significant Relationships

By observing Figure 3 we would be able to see which of the relationships are significant and which are not.

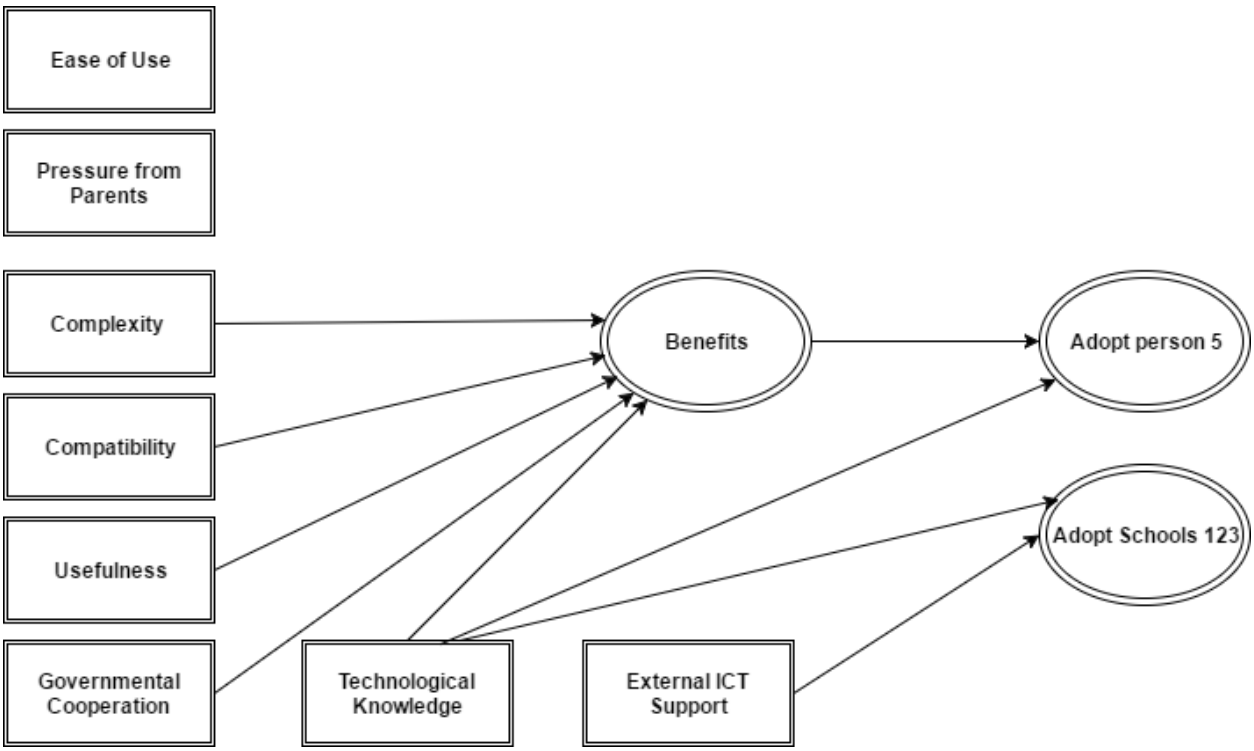

Figure 4. Significant Relationships

5.2 Discussion

During the research study we have mentioned several times that our objectives are to find the gaps and most important factors that influence EMIS post adoption. The main reason of this study was to contribute on the practice and theory of EMIS in the Republic of Macedonia. We used several questions through which we investigated the EMIS post adoption phase. We wanted to find which fields of EMIS usage where more problematic to the teachers and then how they could be improved.

Our findings for H1(abc) reveal that the only significant relation of Usefulness is towards Benefits (H1a). Perceived usefulness is defined as "the degree to which a person believes that using a particular system would enhance his or her job performance" (Davis, 1989, p.320). In our case this means that if a teacher believes that his/her job performance will increase by efficiency, productivity, speed of completing tasks or quality, then they will see EMIS as a beneficent system. Thus the H1a is accepted, and the other two hypotheses H1b and H1c are rejected.

Our findings for H2(abc) reveal that there are no significant relationship of the independent variable Ease of Use towards neither of the three dependent variables. Thus all the hypothesis H2a, H2b and H2c are rejected. It means that professors do not see any benefit if the system is easy to use. The reason for this might be the experience that professors accumulated by using the system insofar and they are accustomed to the system, therefore they do not see any increased benefit by increasing the easiness of the data and screen manipulation.

Our findings for H3(abc) suggest that the only significant relation of Complexity is towards Benefits. This means that H3(a) is accepted and H3(b) and H3(c) are rejected. When an innovation is perceived as difficult to use and understand, it means that the level of complexity is relatively high (Rogers, 2003, cited in Ramdani, 2013). In our case this means that if a teacher belives that using E-Dnevnik is not flexible, takes too much time, requires a lot of mental effort, and is furstrating then this will have a significant negative influence on the benefits of EMIS.

Our findings for H4(abc) suggest that the only significant relation of Compatibility is towards Benefits. This means that the only accepted hypothesis is H4(a) which is accepted and H3(b) and H3(c) are both rejected hypotheses. Compatibility represents the degree to which the new system is similar to the old one, in the context of values, experiences and needs (Rogers, 2003, cited in Lippert & Govindarajulu, 2006). In our case: if the teachers believe that the level of similarity with the old system is acceptable, then it means that E-Dnevnik is compatible with the old system; if there is consistency then it means that E-Dnevnik is compatible with the old system; if the level of change since E-Dnevnik started to be used is acceptable and that the time to learn E-Dnevnik didn't influence negatively the productivity of their work then this means that E-Dnevnik is compatible with the old system. In this case if there is compatibility, it will influence positively on the benefits of EMIS.

Our findings for H5(abc) reveal that the relations of Technological Knowledge are significant towards all the dependent variables (benefits, post adoption in institutional context and post adoption in personal context). This means that all the hypotheses H5(a), H5(b) and H5(c) are accepted. Technological Knowledge represents the institutional technological knowledge of an organization (Govindarajulu & Lippert, 2006). In our case the first significant relationship is between Technological Knowledge and Benefits. This can be explained as if the teachers believe that level of existed ability to use E-Dnevnik is acceptable; level of existed knowledge to use E-Dnevnik is acceptable; level of knowledge on IT is acceptable and level of information on E-Dnevnik is acceptable. If all these are on an accepted level then it means that the Technological Knowledge on their school is on an acceptable degree. In this case if the teachers are satisfied with the technological knowledge level it will influence positively on the benefits of EMIS.

Our findings for H6(bc) suggest that the only significant relation of Benefits is towards Post Adoption in the personal context. This means that H6(c) is accepted and H6(b) is rejected. Perceived benefits can be explained as the degree to which a person can perceive positive consequences after using a particular system (Govindarajulu & Lippert, 2006). In our case if the teachers believe that by using E-Dnevnik they would be able to: manage the process of

education more efficiently; improve the quality of the education process; enhance the effectiveness of the education process; speed the performance of education processes and the level of control on education processes would be acceptable; then they believe that using E-Dnevnik is beneficial. Our results say that if using E-Dnevnik is beneficial then it influences positively the Post Adoption of EMIS in a personal context. The independent variable (Benefits) that is used in this hypothesis to describe the dependent variables Post Adoption in the institutional context and also the Post Adoption in the personal context. Nevertheless during all the other hypothesis the same variable is used as a dependent one.

Our findings for H7(abc) reveal that there are no significant relationship of the independent variable Pressure from Parents towards neither of the three dependent variables. Thus all the hypothesis H7a, H7b and H7c are rejected. Therefore, out assumption based on the interviews about potential influence of the Pressure from Parents on the benefits and post-adoption proves to be wrong.

Our findings for H8(abc) suggest that the only significant relation of Governmental Cooperation is towards Benefits (H8a). This means that H8(a) is accepted and H8(b) and H8(c) are both rejected. Through the qualitative research method we were able to find that the authority level for EMIS decision making process was highly authoritarian. Regarding to (Beckford (1999, p. 3), cited in Joseph, 2011) we can say that this management style can be the manifestation of the plantation system, which is seen as the dominant social, politic and economic institution in the colonial era. Also according to (Beckford (1999, p. 5), cited in, Hinton, Brownlow, McMurray, & Cozens, 2005) 'the plantation will continue to persist because it has become deeply rooted in the environment of many underdeveloped countries and to shake it may well threaten the entire economic and social order'. This administration style based on the interviews and SPSS results is affecting negatively the acceptance of EMIS. Taking into consideration that in the modern world people seek for democratic, collaborative and participative managements approaches and for more qualified and trained stuff, approaches that tend lack of participation are likely to be counter-productive (OECS 2000, p. 40,cited in, Hinton, Brownlow, McMurray, & Cozens, 2005). The results of our research have the same

output as these other mentioned research. It is clear that if the teachers believe that there is cooperation from the government then it would influence positively on EMIS benefits.

Our findings for H9(abc) reveal that the only significant relation of External ICT Support is towards Post Adoption in the institutional context (H9b). This means that H9(b) is the only accepted hypothesis and H9(a) and H9 (c) are both rejected. One of the teachers mentioned that when they were attending seminars for IT knowledge it was much easier for them to adjust with the new system, but during the recent years, the MOES has not organized such seminars and the teachers are suffering the consequences. This makes it very clear that if there is External ICT support it would influence positively the acceptance of EMIS on a personal context.

5.3 Importance of the factors

The most important factor that is influencing benefits is Technology Knowledge, followed by Usefulness, Governmental Cooperation, Compatibility and Cooperation. Therefore, to have the most powerful increase in Benefits, Technology Knowledge must be increased. Of course, efforts should not be directed only towards increasing Technology Knowledge, but also other factors must be continually, if not continuously improved, and the balance must be achieved among the factors.

The most important factor for post-adoption on the personal level is Benefits, followed by the Technology Knowledge. The influence of the Benefits is much higher than the influence of the Technology Knowledge. Therefore, Benefits must be improved. Technology Knowledge has two effects: direct, which is much lower than the effect of Benefits, and indirect through the mediator Benefits. By improving Technology Knowledge, basically we improve Benefits, and through Benefits we improve post-adoption. In the same time there is an existing, but a weak effect on Post-Adoption on a personal level.

The most important factor for post-adoption on the school is External ICT Support, followed by the Technology Knowledge. The influence of External ICT support is much higher than the influence of the Technology Knowledge. Thus, External ICT Support must be improved.

5.4 Relationships conclusion

Based on the significant relationships and on the hypothesis explanations we can conclude that we have 3 important relationships.

1. All independent variables towards Benefits: the significant independent variables are: Technology Knowledge, Usefulness, Governmental Cooperation, Complexity and Compatibility. The dependent variable is Benefits. We have this relationship since all this independent variables do not influence directly the Post Adoption in the personal context. Nevertheless they do have an influence on the Post Adoption on the personal context, but indirectly, through the variable Benefits. Therefore, the factor Benefits is a mediator towards post-adoption in the personal context. That's why this variable stands as both dependent (towards all the other variables) and independent (Towards Post Adoption in both contexts). The statistical results indicate that professors have benefits if the EMIS satisfies certain criteria. EMIS must be less complex. The professors do not want to obtain system that is more complex than the previous one. Also, professors want to work on a system that is compatible with their prior experiences and procedures. EMIS must be accepted as useful. The definition of usefulness must be thoroughly analyzed: What is usefulness for the professors? Since the governmental initiative is to use EMIS, there must be governmental support. The government must take care about the system, maintenance, support, upgrades from the infrastructure and functional perspectives, and to increase and renew professors' technology knowledge, as the last factor is exactly related to this specific knowledge. These can be considered as the gaps of the EMIS.
2. All independent variables towards Post_Adoption_sc(b): the significant independent variables are: External ICT Support and Technological Knowledge. The dependent variable is Post_Adoption_sc(b). By these results we can confirm that if there is External ICT support and enough technological knowledge it would help the user acceptance of EMIS in the institutional context. The accepted hypotheses clearly show that schools will adopt EMIS if there is technology knowledge related to the

system, and external ICT support is present covered with the contract with the appropriate governmental body or external ICT Company. Obviously, schools are facing a problem with financing ICT support, which can be considered as a huge gap on the adoption of EMIS, and therefore this issue must be put on the agenda with the high priority. Recommendations to the government are:

- Government must continually train and educate school's employees

- They must provide ICT support for the infrastructure and installed applications.

3. All independent variables towards Post_Adoption_p(c): the significant independent variables are: Benefits and Technological Knowledge. The dependent variable is Post_Adoption_p(c). By these results we can confirm that if there are perceived benefits and enough technological knowledge it would help the user acceptance of EMIS in the personal context. Therefore, the professors will adopt the EMIS if they a) perceive benefits from the EMIS usage, and b) have sufficient technology knowledge. Since these can be considered as the gaps of EMIS the recommendations that we can give to the government, based on this study's outcomes are:

   - Professors should be included as stakeholders on a higher scale during all phases of the systems development life cycle. Based on the inputs from the professors, the EMIS could have potential to be perceived as a beneficial to the professors;

   - To increase the adoption of the EMIS, the government must organize and conduct continual training to increase the professors' technical knowledge.

It is interesting to note that there is no association between post_adoption on a personal level and post adoption of the school. If the school adopt EMIS by providing management support for its implementation, it does not mean that professors will adopt as well. The oposite is also valid: if the professors adopt the EMIS, it does not mean that school will adopt it. Maybe professors want to use it for their daily activities, but the school might not allocate financial resources for its support. In ideal case, both post adoptions should happen. In

that case, professors will be responsible for fulfillment of their obligations, while the school will be ultimately accountable for smoothly running the system, either by their own effors or by pushing the government to help and support.

5.5 Limitations

Even though this research was carefully prepared, we are still aware of some unavoidable limitations. The main limitations are the financial and time limits. We have studied the post adoption of EMIS only on primary schools of Struga. These schools are very small in number compared to all the public primary and secondary schools in the Republic of Macedonia. If done differently it would have taken a longer amount of time and more financial support. Besides during our research there were factors for which were not found validated instruments. We had to adapt and use items that were used in other similar studies (Straub, 1989, cited in, Stamenkov & Dika , 2015)

5.6 Future research

Since this study is a case study and the results cannot be generalized, there is a lot of space for future research. We would mention some of them since they would too help on understanding the post adoption phase of EMIS.

First we would recommend to be done an investigation for selecting the appropriate EMIS for our country. Since Macedonia is a small developing country and facing a lot of challenges at the same time, an EMIS that would suit our particular needs would be valuable since it would address the issues of complexity and governmental cooperation, both that influenced negatively the EMIS post adoption.

Since the results of this study cannot be generalized another similar study can be conducted to determine whether the results of this study would be similar as in other schools under the same conditions. The usefulness of this would be that, if the results are similar they could be generalized.

The last proposition would be on conducting a similar research in the neighboring countries. The results of this study would help us know whether the development of a country is a significant factor that influences its post adoption.

6 CONCLUSION

The main contribution of this study is to theoretically and empirically discover the most important factors that influence EMIS post adoption. The gained results showed that TAM and TOE are very powerful tools to analyze the post adoption of EMIS in the education system of Macedonia. This study reveals that two types of post adoption can be discriminated: on a personal level and on a school level. Factors that influence both type of adoption are presented and explained. Also the importance of the Benefits is clearly indicated. Beside everything else the results confirmed that there is no association between the post adoption on a personal level and post adoption of the school. The findings of this study can be used by the government for future improvements which can increase the user acceptance level of EMIS and improve its post adoption on both personal and school level.

REFERENCES

Angeles, R. (2013). *Using the Technology-Organization-Environment Framework and Zuboff's Concepts for Understanding Environmental Sustainability and RFID: Two Case Studies. International Journal of Social, Education, Economics and Management Engineering.*

Awa, H. O., Ukoha, O., & Emecheta, C. B. (2012). *Integrating TAM and TOE Frameworks and Expanding their Characteristic Constructs for E-Commerce Adoption by SMEs. Informing Science & IT Education Conference (InSITE).* Informing Science Institute.

Bekford, G. (1999). *Persistent Poverty: Underdevelopment in Plantation Economies of the Third World.* Jamaica: Oxford University Press.

Brown, S. (2016). Measures of Shape: Skewness and Kurtosis. *Math and Science*, 50-62.

Cambridge Dictionary. (1995). Retrieved December 03, 2016, from http://dictionary.cambridge.org/dictionary/english/reliability

Carrizo, L., Sauvageot, C., & Bella, N. (2002). *Information tools for the preparation and monitoring of education plans.* UNESCO.

Creswell, J. W. (2003). *Qualitative, Quantitave and Mixed Methods Approaches* (2nd ed.). California: Sage Publications, Inc. .

Field, A. (2005). *Discovering Statistics Using SPSS.* London: Sage.

Field, A. (2011). *DISCOVERING STATISTICS USING SPSS.* London: Sage Publications LTD.

Gangwar, H., & Date, H. (2015). Understanding determinants of cloud computing adoption using an integrated TAM-TOE model. *Journal of Enterprise Information Management, 26*(3), 250-275.

Ghobakhloo, M., Sabouri, M. S., Hong, T. S., & Zulkifli, N. (2011). Information Technology Adoption in Small and Medium-sized Enterprises; An Appraisal of Two Decades Literature. *Interdisciplinary Journal of Research in Business*, 53-80.

Gibs, J. L., & Kraemer, K. L. (2004). A Cross-Country Investigation of the Determinants of Scope of E-commerce Use: An Institutional Approach. Electronic Markets.

Govindarajulu, C., & Lippert, S. K. (2006). Technological, Organizational, and Environmental Antecedents to Web Services Adoption. *Management Information Systems Commons, VI*(1).

Guarino, N. (1998). Formal Ontology and Information Systems. *IOS Press,*.

Hair, J. F., Anderson, R., & Babin, B. (2009). Multivariate Data Analysis.

Hinton, P. R., Brownlow, C., McMurray, I., & Cozens, B. (2005). *SPSS Explained.* USA: Routledge.

Hua , H., & Herstein, J. (2003). Education Management Information System (EMIS): Integrated Data and Information Systems and Their Implications In Education Management. *Conference of International Education Society.* New Orleans, LA: Conference of Comparative and International Education Society.

Ifinedo, P. (2011). An Empirical Analysis of Factors Influencing Internet/E-Business Technologies Adoption by SMEs in Canada. *International Journal of Information Technology & Decision Making, 10*(4), 731-766.

Ifinedo, P. (2011, July). An Empirical Analysis of Factors Influencing Internet/E-Business Technologies Adoption by SMEs in Canada. *International Journal of Information Technology and Decision Making*, 731-766.

Igbaria, M., Zinatelli, N., Cragg, P., & Cavaye, A. L. (1997). Personal Computing Acceptance Factors in Small Firms: A Structural Equation Model. *MIS Quarterly*, 279-305.

Jackson, D. L. (2003). “Revisiting sample size and number of parameter estimates: some support. *Structural Equation Modeling, 10*(5), 128-141.

Jeyaraj, A., Rottman, J. W., & Lacit, M. C. (2006). A review of the predictors, linkages, and biases in IT innovation adoption research. *Journal of Information Technology, 21*(1), 1-23.

Joseph, E. C. (2011). *An Investigation into the Use of the Education Management Information System (EMIS) in Secondary Schools in St. Lucia – The Case of One Secondary School.*

Kline, R. B. (2011). *Principles and Practice of Structural Equation Modeling.* The Guilford Press, New York, NY .

Konopka, R., & Korrapati, R. (2006). PROPERTIES OF SHARED KNOWLEDGE - APPLICATION OF HIGHLY INTEGRATED INFORMATION SHARING SYSTEMS IN PUBLIC EDUCATION. *Proceedings of the Academy of Information and Management Sciences*, 31-35.

Lee, M. S. (2009). An Empirical Study about RFID Acceptance. *World Academy of Science, Engineering and Technology*, 1044-1053.

Lee, Y., Kozar , K. A., & Larsen, K. R. (2003). The Technology Acceptance Model: Past, Present, and Future. *Communications of the Association for Information Systems, 12*(1), 752-753.

Looi, H. C. (2005). E-COMMERCE ADOPTION IN BRUNEI DARUSSALAM: A QUANTITATIVE ANALYSIS OF FACTORS INFLUENCING ITS ADOPTION. *Communications of the Association for Information Systems*, 61-81.

Micheni, E. M. (2015). Using the Technology Organization Environment Framework for Adoption and Implementation of Cloud Computing in Institutions of Higher Learning in Kenya.

MOES. (2015, 8 4). Упатство за користење и внесување на податоци во Е-Дневникот. p. 4.

Moses. (2000). Planning for Technologies – Information Systems for Education. *Knowledge Enterprise Inc. Available* .

Ntoumanis, N. (2005). *A Step-by-Step Guide to SPSS for Sport and Exercise Studies.* London; New York: Routledge.

OECS. (2000). *OECS Education Reform Strategy,Eastern Caribbean Education Reform Project: Establishing a Sub-Regional.*

Pfeffer, J. (1982). Organizations and Organization Theory. *Journal of Economic Theory*.

Prima Medica Company. (1998). *Prima MEDIKA.* Retrieved January 24, 2015, from http://www.prima-medica.com/files/manuals/pmupatstvo.pdf

R, S., & G, R. (2010). *Fundamentals of Information Systems* (5 ed.).

Radner, R., & Rothschild, M. (1975). On the Allocation of Effort. *Journal of Economic Theory, 10*, 358.

Ramdani, B. (2013). SMEs' adoption of enterprise applications A technology-organisation-environment model. *Journal of Small Business and Enterprise Development*, 736-740.

Reynolds, G. W., & Stair, R. M. (2010). *Principles of Information Systems* (9th ed.). Boston: Course Technology.

Shuttleworth, M. (2015). *Explorable*. Retrieved January 17, 2017, from https://explorable.com/operationalization

SPSS Base 16.0 User's Guide. (2007). USA.

Stair, R., & Reynolds, G. (2010). *Fundamentals of Information Systems* (5th ed.). USA: Cengage Learning .

Stamenkov, G., & Dika , Z. (2015). A sustainable e-service quality. *Journal of Service Theory and, 25*(4), 414-442.

Timetrade Systems . (2013). *Timetrade.* Retrieved January 24, 2015, from http://timetradedev.prod.acquia-sites.com/system/files/resources/TT-SB-HealthCare.pdf

Ultra Computing. (2010). *Ultra Computing.* Retrieved November 17, 2016, from http://www.ultra.com.mk/newweb/education.html

Yang, Z., Sun, J., Zhang, Y., & Wangd, Y. (2014). Understanding SaaS adoption from the perspective of organizational. *Computers in Human Behavior*.

Yong Zhao, K. A. (2003). Factors Affecting Technology Uses in Schools: An Ecological Perspective. *American Educational Research Journal, 40*(4), 807 - 840.

Zhu, K., Kraemer, K. L., & Xu, S. (2002). A Cross-Country Study of Electronic Business Adoption Using the Technology-Organization-Environment Framework. pp. 337-348.