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Digital technologies integration in the classroom. A teacher's perspective

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Abstract

This paper focuses on determining and analyzing the factors which lead high school teachers in southeastern Albania to integrate digital technologies in the classroom. For this purpose, a survey was conducted. Factor analysis was used to determine the factors and the Pearson correlation coefficient was used to analyze the correlation of these factors. This method proved to be stable and reliable and can be recommended for use in educational technology research. Based on the factors' inter-correlations, an apparent result is that: a better knowledge of software applications positively influences teachers' digital technology use and their self-confidence. It also increases teachers' motivation to use digital technologies in the classroom. Competence seems to be the most relevant factor that influences teachers to integrate digital technologies in the classroom.

Keywords: digital technologies, competence, factor analysis, teaching, high school;

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1. Introduction

1.1 Purpose of the Study

Digital technology has changed our world over the years. It has created tools and resources by providing us with ready and useful information. Modern digital technology has made it possible to discover many multifunctional devices such as smart watches, smart TV, smartphones, etc. The growth and development of technology are increasingly making it part of many aspects of life.

Computers, the Internet, and other technological equipment have become major contributors to the transformation of education. They have made the lesson clearer and demonstrated with many concrete examples. Teachers use digital technology to communicate with students, better explain the lecture, simulate and demonstrate various examples, and develop and implement online tests and questionnaires. Students, on the other hand, can use digital technologies for purposes such as expanding the knowledge explained by the teacher in the classroom and by reading additional information while browsing the Internet.

During these two years of pandemics, it became clear all over the world, that digital technology was essential to continue with the educational process. Universities in Albania during the academic year 2020-2021 developed the teaching process online. While high schools and elementary schools developed the teaching process by combining online learning with face-to-face.

The degree to which schools are equipped with the necessary digital technological infrastructure, the inclusion of digital technologies in the teaching process, the use of digital technologies by students and teachers, as well as the impact that they have on students' knowledge are all integral parts of educational technology. Surveys are widely used by researchers, especially in the fields of educational research. Based on the sample, they can provide information on students learning, teaching methods, and factors affecting the quality of education.

However, conducting a survey on these topics can be a challenging task for researchers of education technology, especially those in developing countries. The first is developing a questionnaire that can be used to gather data regarding all aspects of the implementation of digital technology in education. Another challenge is that the factors that influence teachers' efforts to teach with the help of digital technology, cannot be measured directly by using a single question. Factor analysis is a method used to identify the basic factors (patterns or characteristics) that can be described by combining a larger number of variables. Since we consider factor analysis as an important tool in the field of educational research and educational technology, this paper's aim is to evaluate the teacher's willingness, knowledge, and use of digital technologies in classroom using factor analysis. Through this, the paper tries to answer the question: What are the main factors that lead teachers to integrate digital technologies into the teaching process?

1.2 Theoretical Framework

1.2.1 Factor analysis

"Factor analysis is a method used to describe, if possible, the covariance relations among many variables in terms of a few underlying, but unobservable, random quantities called factors" (Johnson & Wichern, 2007). Simply put: it takes a large number of variables and explains them or summarizes their information with a set of factors much smaller in size. It is worth noting that factor analysis should not be confused with Principal Component Analysis (PCA). Both are dimension reduction techniques. However, PCA finds the principal components, by constructing linear combinations of the original variables. So, this procedure can sometimes produce an artificial variable that does not always make sense. On the other hand, factor analysis studies the covariance between the original variables and produces factors that actually explain this covariance. So the attained underlying factors have actual meaning and can be named and further interpreted.

According to Johnson and Wichern (2007) "there are two types of factor analysis:

- exploratory factor analysis (EFA)
- confirmatory factor analysis (CFA)"

For anyone interested in the mathematical treatment of factor analysis, see Johnson and Wichern (2007), there is an abundant amount of information on the internet that can also be helpful. In this paper, there will be made only a very brief description of the model, as our focus will be on the example.

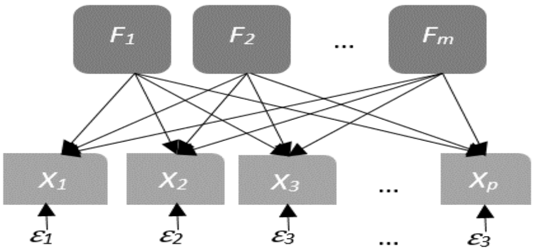
1.2.2 The factor model

Let's suppose that to study a random variable X we are conducting a survey on a sample of size n and that it consists of p questions. The latter are the p components of the random variable X. We denote them $X_1, X_{2\ldots} X_p$. From the gathered data we can calculate the mean vector μ and the covariance matrix Σ.

We suspect that each of the variables $X_1, X_{2\ldots} X_p$ is affected by a smaller number of latent variables. Factor analysis asserts that each of the p variables of the study can be expressed as a linear combination of fewer m factors ($F_1, F_{2\ldots} F_m$) see Figure 1, each multiplied by its respective loading ($\lambda_{1i}, \lambda_{2i\ldots} \lambda_{pi}$) plus additional sources of variations, called errors ($\varepsilon_1, \varepsilon_{2\ldots} \varepsilon_p$).

Figure 1

A schematic diagram of factor analysis



The above can be represented with a vector of equations:

$$X_1 = \mu_1 + \lambda_{11}F_1 + \lambda_{12}F_2 + \cdots + \lambda_{1m}F_m + \varepsilon_1$$

$$X_2 = \mu_2 + \lambda_{21}F_1 + \lambda_{22}F_2 + \cdots + \lambda_{2m}F_m + \varepsilon_2$$

$$\vdots$$

$$X_p = \mu_p + \lambda_{p1}F_1 + \lambda_{p2}F_2 + \cdots + \lambda_{pm}F_m + \varepsilon_p$$

Or, more compactly in matrix form:

$$X_{p\times 1} = \mu_{p\times 1} + \Lambda_{p\times m}F_{m\times 1} + \varepsilon_{p\times 1}$$

The factor model:

$$X - \mu = \Lambda F + \varepsilon$$

Specifying the number *m* of factors of the model is an important step of factor analysis. In EFA this is usually done by means of a scree plot. A scree plot is a line plot that represents the eigenvalues of the factors and the number of factors. The point of the curve from which the eigenvalues start dropping their value is the number of factors.

1.2.3 Rotation

Factor loading matrices are not unique. In fact, there are infinitely many matrices (which correspond to factors orientation) that can explain the original variables just as well. Thus, in the last step of factor analysis the factor loading matrixes are rotated to find a simpler structure that can explain the data.

The two forms of rotations:

- the orthogonal rotation, which is used when working under the assumption that the factors are not correlated with each other
- the oblique rotation, which is used when the factors could be correlated

Varimax is the most popular orthogonal rotation method, as it maximizes the simplicity of the factor loadings (Forina et al., 1988). This is the method used in our study as well. On the other hand, oblique rotations are commonly performed with the ProMax method. If you want a detailed explanation of these last methods, you can refer to Jackson (2005).

1.3 Related Research

Countries all over the world have identified the significant role of information and communication technology in improving education (Kozma & Anderson, 2002; Hennessy et al., 2005). Many institutions of higher education are implementing online learning to provide better learning opportunities (Ally & Tsinakos, 2014). According to Prodani et al., (2020) "Assessing the level of access, use and impact of ICTs in education is an important task that governments of each country should periodically do for some key reasons.

- Firstly, the lack of such an assessment creates a gap between the current level of ICTs and the perceived level of ICTs in the country.

- Secondly, a fact that makes such an assessment necessary, is that it creates a greater understanding about developments in ICTs related to education as well as the tangible benefits we may have from their implementation.".

"The main purpose of extending Information and Communication Technology in schools is to increase the quality of teaching and equip students with the right digital citizenship skills to be able to study, research and work in a world increasingly driven towards computerization of processes and services." (Minister for Innovation and Public Administration [MIPA], 2015). According to the Institute of Education Development, Ministry of Education and Sport (2015), there have been identified several reasons that determine the importance and necessity of using digital technology during the teaching process in Albania. These include:

- The use of digital technology would offer a way to get away from traditional learning and make the students more interested in learning.
- It would help reduce the student's learning time. Teachers and parents recognize that using technology makes their students and children use their work time more efficiently.
- The use of digital technology positively influences students' attitudes, making them feel more successful, motivated, and confident.

In terms of investments in digital technology in schools, significant investments have been made in supporting physical infrastructure. As a result of these investments, there are about 1496 computer labs with a total of 24,125 computers in Albanian pre-university schools. Internet is present in all these schools, each of which has a dedicated broadband connection. Appropriate network infrastructure has been installed and configured in schools in Albania to enable teachers and students, to utilize various resources to improve the teaching and learning process through the application of new technologies in education (The Open Society Foundations, 2015).

Based on the published data of MIPA (2015), digital technologies problems in education include:

- the ratio of the number of computers in use, per student varies from school to school. Roughly, this ratio is 1:27 in some cases even lower;
- students can access information only in computer labs, but not in other school settings such as libraries, or classrooms;
- in more than 1/3 of schools, students have limited access to online information;
- digital content in the native language is completely missing;
- the risk of exposure to inappropriate content has manifested itself;
- children using the internet are not made aware of phenomena such as mockery, cyberbullying, or online child abuse (Grooming).

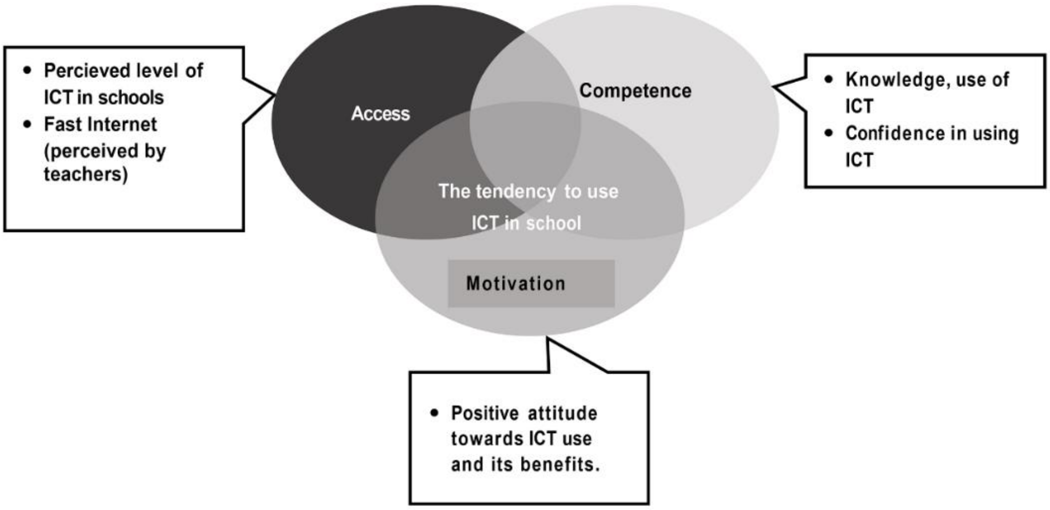
That means our schools are moderately equipped with computers at the lowest level, see levels implemented by Cate (2017). Although many investments have been made for the purchase of software and hardware in high schools, their use in the classroom is small. More attention is needed for implementing digital technologies in education to enable a knowledge-based society and improve the digital technology skills of users on a large scale.

The effective use of technology in different organizational settings is directly associated with the intertwining of technical and social elements (Friedman, 1998; Senteni, 2006), and undoubtedly the mere focus of most studies on what students learn from technology has left a gap in understanding, why and how teachers use or do not use technology to teach in schools. It is important to point out that the positive impacts of technology depend on how much teachers use technology in their classes (Kozma, 2003). Kozma (2001) also emphasizes that special features of computers are needed to bring real-life models and simulations to the learner, so the media does not interfere with learning.

According to Viherä and Nurmela (2001), (see the typology in Figure 2), these are the three prerequisite categories that a school needs to meet in order to use computers and the Internet to aid the learning process in the classroom: Access to technologies, Competence in their use, and Motivation (ACM). Access means teachers' perceived level of digital technologies penetration in school, Competence means the ability to use computer programs, the internet, and their implementation in teaching aids, and Motivation means awareness of the benefit of using computers to help teaching.

Figure 2

The "Access, Competence, Motivation (ACM)" Model



Shulman (1986) proposed that effective teaching requires a special type of knowledge, pedagogical content knowledge (or PCK), that represents "the blending of content and pedagogy into an understanding of how particular topics, problems, or issues are organized, represented, and adapted to the diverse interests and abilities of learners, and presented for instruction".

In order for teachers to use digital technology more effectively in classrooms, Mishra and Koehler (2006) formulated the technological, pedagogical, and content knowledge (TPACK) framework. "TPACK is an emergent form of knowledge that goes beyond all three "core" components (content, pedagogy, and technology). Technological pedagogical content knowledge is an understanding that emerges from interactions among content, pedagogy, and technology knowledge. Underlying truly meaningful and deeply skilled teaching with technology, TPACK is different from knowledge of all three concepts individually" (Koehler & Mishra, 2009).

Koehler's et al. (2014) formulation of the technological, pedagogical, and content knowledge (TPACK) framework extended Shulman's (1986) characterization of teacher's knowledge to explicitly consider the role that knowledge about technology, can play in effective teaching.

2. Method and Materials

2.1 Research Model

Factor analysis can be a great tool for identifying the factors that prevent teachers from integrating these digital technologies into teaching. The authors agree with Alavi and Carlson (1992) that "case study is one of the most common methods applied in the Information Systems (SI) field". Assessing the ACM model as being essential in determining the attitude of teachers towards digital technologies inclusion in teaching, the authors conducted a survey with part of public high school teachers in Southeastern Albania.

2.2 Participants and Data Collection Process

Seven public high schools in Southeastern Albania participated in the study and the sample consists of 120 teachers. All teachers that were asked, were willing to participate in this survey. They were aged between 25 and 64 years old (with an age average of 42.18 years old). The majority of teachers surveyed (74%) were female and they had an average of 13.58 years of teaching experience.

The sample for this survey was designed in two stages:

- In the first stage, high schools were selected with probabilities according to their size and we finally selected seven of them.
- In the second stage, one class was randomly selected from each grade (i.e. grades 10, 11, 12), and all teachers teaching in the selected classes were surveyed. Classes were selected with equal probabilities within each school.

2.3 Data Collection Tools

Conducting research can be a challenging task. The first step (and usually also the first difficulty) is finding the appropriate instrument. The instrument that the authors used to conduct the survey was originally developed by Papanastasiou and Angeli (2008) and it is the Survey of Factors Affecting Teachers Teaching with Technology (also known as SFA-T3). This questionnaire consists of six sections. It begins with a demographic section that asks teachers for information about their age, gender, years of work as a teacher at the current school, as well as the number of ICT labs and computers in them.

The other sections of this questionnaire are 2. Knowledge of computer software, 3. Frequency of using software, 4. Attitude towards integrating computers in teaching, 5. Self-confidence in the integration of digital technology, 6. School climate and support. In sections 2-6 the surveyed teachers expressed their opinion through Likert- scale statements ranging from 1-5 (for section 2 the answers ranged from 1-I cannot use it to 5-I can use it very well; for section 3 the answers ranged from 1-Never to 5- Almost every day; whereas for the other three sections the answers ranged from 1-

strongly disagree to 5-completely agree). There were made some minor changes by the authors, to some of the questions in order to make them fit the context and reality of Albanian schools. Following these changes the level of reliability of the questionnaire needed to be tested. This was done separately for each section using Chrombach's Alpha coefficient. The coefficient values for each section are presented in Table 1, and they show a high level of consistency of the questionnaire questions for the sample being studied.

Table 1

Reliability Statistics

Sections	Cronbach's Alpha	N of Items
Knowledge of computer software	.892	15
Frequency of using software	.804	15
Attitude towards integrating computers in teaching	.807	13
Self-confidence in the integration of digital technology	.852	8
School climate and support	.905	6

2.4 Data Analysis

The data gathered for the survey were analyzed with SPSS v20.0 software. Since the items in sections 2-6 were designed to jointly measure a specific factor, exploratory factor analysis was the right tool to use, to conceptually identify the factors that lead teachers towards integrating technology in teaching. Since the questionnaire sections did not have the same scale and therefore were not comparable to each other, each section was tested separately. Factor analysis was implemented using the PCA as a way for extracting the factors and Varimax as a rotation method with the set condition of eigenvalues greater than 1.

3. Results

3.1 Knowledge of Computer Software

Firstly, the factor analysis was carried out on the 15 elements of the second section of the questionnaire. This analysis generated 2 factors, see Table 2. The first factor describes 34.27% of the variance and consists of 6 elements. This factor was labeled Knowledge of common software applications, as it consists of elements that evaluate teachers' knowledge of the most popular presentation applications, spreadsheet applications, word processing applications, image/graphics applications, Internet search, presentation applications, and Email. The second factor explains 27.54% of the variance and consists of the 9 remaining elements. This factor was labeled Knowledge of specialized software applications, as it consists of elements that evaluate teachers' knowledge of specific and not much-used software such as: DBMS applications, publishing applications, programming languages, web developing technologies, school management platforms, etc.

Table 2

Rotated Component Matrix for knowledge of computer software

	Component	
	1	2

Word Processing (e.g., Words)	-.021	.898
Databases (e.g., Access)	.607	.337
Spreadsheets (e.g., Excel)	.342	.540
Image, Graphics (e.g., Paint, Photoshop)	.308	.641
Multimedia (e.g., HyperStudio)	.642	.101
Presentations (e.g., PowerPoint)	.094	.844
Internet (e.g., information search)	.053	.816
Communicating (e.g., Email, Skype)	-.022	.822
Publishing (e.g., Adobe Illustrator)	.708	.119
Developing web pages (e.g., FrontPage, Wordpress)	.861	.241
Concept mapping (e.g., MindView, Inspiration)	.828	.101
Programming Languages (e.g., Java, PHP)	.846	-.097
Modification of programs (eg Model-It, Stella)	.765	.150
Online learning management systems (eg, Sitos, Moodle)	.808	.142
Online school administration platforms (e.g., Socrates)	.713	.234

3.2 Frequency of Using Software

The authors performed the factor analysis on 15 elements of the third section of the questionnaire, see Table 3. The first factor produced by the factor analysis explains 25.64% of the variance and consists of 7 elements. This factor includes computer games, presentation applications, word processing applications, spreadsheet applications, image/graphics applications, Internet search, and Email., and is called Use of Common Software Applications. The second factor explains 19.44% of the variance and comprises of 8 elements, including the usage of DBMS applications, publishing applications, programming languages, web developing technologies etc. This factor is called Use of Specialized Software Applications.

Table 3

Rotated Component Matrix for frequency of using software

	Component	
	1	**2**
Playing with games, movies (e.g., Solitaire, Fifa)	.438	-.154
Presentations (e.g., Prezi)	.606	-.008
Word processing (e.g., Word)	.608	.096
Publishing (e.g., Adobe Illustrator)	.156	.620
Spreadsheets (e.g., Google Sheets)	.675	.347
Image, Graphics (e.g., Paint, Photoshop)	.575	.159
Databases (e.g., Access)	.037	.728
Internet (e.g., information search)	.802	-.144
Communicating (e.g., Email, Skype)	.772	-.200
Developing web - sites(e.g., Frontpage, Wordpress)	.331	.357
Multimedia creations (e.g., Hyperstudio)	.516	.588
Programming Languages (e.g., Java, PHP)	-.072	.780
Online learning (eg KhanAcademy)	.240	.653
Online learning management systems (eg, Sitos, Moodle)	.275	.438
Online school administration platforms (e.g., Socrates)	.336	.548

3.3 Attitude towards Integrating Computers in Teaching, Self-Confidence in the Integration of Digital Technology and School Climate and Support

After performing the factor analysis on the last three sections of the questionnaire, 3 additional factors were produced, see Table 4. The first factor, called Positive Attitude toward integrating computers in teaching, explains 21.47% of the variance and includes the elements: "I feel comfortable with the idea of computers as a teaching and learning tool.", "The idea of using a computer in teaching stresses me out." "If something goes wrong I will not know how to fix it.", "The idea of using a computer in teaching and learning makes me skeptical.", "The use of computers as a teaching tool motivates me.", "The computer is a valuable tool for teachers.", "The computer will change the way I teach.", "The computer will change the way students learn in my classrooms.", "The computer is not conducive to student learning because it is not easy to use.", "Computer helps students understand concepts more effectively.", "Computer helps students learn because it allows them to express their opinion in better and different ways.", "Computer helps teachers teach in more effective ways.", "Computer does not lead to better teaching because it creates technical problems.".

The second factor is called Self-Confidence. This factor explains 18,57% of the variance and includes the elements: "I can choose the right software to use in my teaching.", "I can use PowerPoint in my class.", "I can create technology-enhanced learning activities for my students.", "I can use email to communicate with my students.", "I can teach my students to choose the appropriate software to use in their projects.", "I can teach my students how to make their own web pages.", "I can use the internet in my teaching to accomplish my learning goals.", "The computer can help students understand concepts more easily.".

The third factor is called digital technologies Access and Support in School. This factor explains 12.25% of the variance and consists of these 6 elements: "ICT Specialist encourages me to integrate computers into learning and teaching.", "There are other teachers in my school who use digital technology while learning and teaching.", " Teachers in my school are well informed about the value of computers in teaching and learning.", "A variety of computer software is available for use in my school.", "The technical support in my school is adequate.", "The technical infrastructure in my school is adequate.".

Table 4

Component Matrix for the three remaining factors

	Component		
	1	2	3
"I feel comfortable with the idea of computers as a teaching and learning tool"	.617	-.456	-.219
"The idea of using a computer in teaching stresses me out"	-.042	-.041	-.119
"If something goes wrong I will not know how to fix it"	-.665	.035	-.612
"The idea of using a computer in teaching and learning makes me skeptical"	-.559	-.272	.236
"The use of computers as a teaching tool motivates me"	.549	-.429	.196

"The computer is a valuable tool for teachers"	.639	-.623	.031
"The computer will change the way I teach"	.648	-.489	-.054
"The computer will change the way students learn in my classrooms"	.797	-.247	-.269
"The computer is not conducive to student learning because it is not easy to use"	-.133	.066	-.084
"Computer helps students understand concepts more effectively"	.644	.527	-.282
"Computer helps students learn because it allows them to express their opinion in better and different ways"	.609	.535	-.012
"Computer helps teachers teach in more effective ways"	.571	-.446	.050
"Computer does not lead to better teaching because it creates technical problems"	-.183	.181	.148
"I can choose the right software to use in my teaching"	.117	.564	.546
"I can use PowerPoint in my class"	.429	.522	.051
"I can create technology-enhanced learning activities for my students"	.063	.726	.308
"I can use email to communicate with my students"	.403	.540	.325
"I can teach my students to choose appropriate software to use in their projects"	.202	.571	.505
"I can teach my students how to make their own web pages"	.307	.514	.078
"I can use the internet in my teaching to accomplish my learning goals"	.161	.650	.301
"The computer can help students understand concepts more easily"	.193	.816	.011
"ICT specialist encourages me to integrate computers into learning and teaching"	.472	.009	.608
"There are other teachers in my school who use digital technology while learning and teaching"	.121	.404	.621
"Teachers in my school are well informed about the value of computers in teaching and learning"	.095	.321	.508
"A variety of computer software is available for use in my school"	-.048	.314	.712
"The technical support in my school is adequate"	.703	.297	.777
"The technical infrastructure in my school is adequate."	.014	.425	.582

4. Discussion

It is noted by the authors that the 5 factors produced by means of factor analysis fit well with the ACM model. Table 5 shows these factors grouped according to ACM model.

Table 5

Factors grouped according to ACM model

	Factors
Access	Digital technologies access and support;
Competence	Knowledge of common software applications
	Knowledge of specialized software applications
	Self-Confidence;
Motivation	Attitude towards integrating computers in teaching;

Following the factor analysis, the inter-correlation of the 7 aforementioned factors was examined using the Pearson correlation coefficient, see Table 6. The authors note that the strongest correlations are between the knowledge of specialized applications and the usage of specialized applications (r = 0.752) and between the knowledge of common applications and the use of common applications (r = 0.569). This indicates that teachers who have better knowledge of computer applications (specialized or common) use them more (for work as well as for personal reasons), which is a reasonable result.

Also, the authors note a moderately positive correlation among self-confidence and all other study variables. More specifically, self-confidence is more correlated with ICT access and school support (r = 0.665), which shows the importance of infrastructure and school support to increase teachers' confidence in using ICT. Also noteworthy, are the correlations between self-confidence and knowledge of common software applications (r = 0.478), their use (r = 0.309), and knowledge of specific software (r = 0.379).

Finally, it is noted by the authors that the Attitude toward integrating computers in teaching is also correlated with almost all other variables of the study. It is noticeable that this factor is especially correlated with self-confidence (r = 0.505). This indicates that teachers who are confident in their ICT skills are those who have a more positive attitude towards computer use in teaching. But teachers' attitude is also positively correlated with the knowledge of common software application (r = 0.497) and their use (r = 0.499), with their knowledge of specific software (r = 0.238) and with ICT access and support in school (r = 0.391).

Table 6

The inter-correlations between the factors of this study

	Knowledge of common software applications	Knowledge of specialized software applications	Use of common software applications	ICT access and support in school	Self - confidence
Knowledge of specialized software applications	.401**				
Use of common software applications	.569**	.446**			
Use of specialized software applications	.267**	.752**	.444**		
Self-confidence	.478**	.379**	.309**	.665**	

Attitude towards integrating computers in teaching	.497**	.238**	.499**	.391**	.505**

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

5. Conclusion

Integrating digital technologies into teaching is becoming an essential part of educational strategies in our country in recent years. But even though there are teachers that try to include digital technologies in the teaching process, their use in our country's educational institutions is generally limited. According to Prodani et al. (2020) the use of ICT in subjects such as Mathematics, Physics, Biology, Chemistry, History, Geography, Albanian Language, and Literature is on average once or twice a semester, a very low level of use. The authors used factor analysis to determine the factors that lead teachers to integrate digital technologies into the teaching process. The data was gathered using, the SFA-T^3 questionnaire, which proved to be a suitable tool with high reliability.

The factor analysis performed on the data provided by the survey with high school teachers in Southeastern Albania created these 7 factors: 1) Knowledge of common software applications; 2) Use of common software applications; 3) Knowledge of specialized software applications; 4) Use of specialized software applications; 5) Self- Confidence; 6) Attitude towards integrating computers in teaching; 7) Digital Technologies access and support. The above-mentioned factors and the correlations between them validated the predictions of the ACM model. The authors think that Access, Competence, and Motivation are the main big factors that influence teachers integrating digital technologies into the teaching process.

Attitude towards integrating computers in teaching is also an important factor as it correlates to all other factors, but more correlates to self-confidence. Self-confidence is more correlated to ICT access and support in school. This shows how interconnected these factors are and how important is the support and help that teacher should have in schools for implementation of digital technologies in classroom. The data supported the clear result that a better knowledge of software applications positively influences teachers' digital technologies use and their self-confidence. It also increases their motivation to use digital technologies in their classroom. Based on the factors' inter-correlations, Competence seems to be the most relevant factor that influences teachers to integrate digital technologies in the teaching process.

6. Recommendations

The authors recommend that during university studies, lecturers teach their students in the "Teacher Education Programs "about web technologies and applications related to their specific field of study. In general, it can be said that the more students learn about digital technologies like "common" and "specialized" applications, the more they are going to implement digital technologies in the classroom when they became teachers.

The authors also recommend, that before making investments on digital technology in schools, governments should assess teachers' readiness for using these digital technologies in their teaching process using factor analysis method and ACM model.

References:

Alavi, M., & Carlson, P. (1992). A review of MIS research and disciplinary development. *Journal of Management Information Systems, 8(4)*, 45-62. https://doi.org/10.1080/07421222.1992.11517938.

Ally, M., & Tsinakos, A. (Eds.). (2014) *Increasing access through Mobile Learning.* http://hdl.handle.net/11599/558

Cate, J. W. (2017). *"Students to Computer Ratio, Socioeconomic Status, and Student Achievement"* (Paper 3284) [Doctoral dissertation, East Tennessee State University]. Electronic Theses and Dissertations. https://dc.etsu.edu/etd/3284/

Forina, M., Armanino, C., Lanteri, S., & Leardi, R. (1988). Methods of varimax rotation in factor analysis with applications in clinical and food chemistry. *Journal of Chemometrics, Vol. 3,* 115-125. https://doi.org/10.1002/cem.1180030504.

Friedman, B. (Ed.). (1998). *Human values and the design of computer technology.* Cambridge: Cambridge University Press.

Hennessy, S., Ruthven, K., & Brindley, S. (2005). Teacher perspectives on integrating ICT into subject teaching: commitment, constraints, caution, and change. *Journal of Curriculum Studies, 37(2),* 155–192. https://www.educ.cam.ac.uk/research/projects/istl/WP042.pdf

Institute of Education Development, Ministry of Education and Sport. (2015). *Learning with situations, constructivism and technology. Guide for teachers".* http://dartiraneqark.edu.al/images/Udhezuesi-me-situata-te-te-nxenit-me-TIKun.pdf.

Jackson J. E. (2005). Oblimin Rotation. In P. Armitage and T. Colton(eds.). *Encyclopedia of Biostatistics.* John Wiley & Sons. https://doi.org/10.1002/0470011815.b2a13060

Johnson, R.A., & Wichern, D.W. (2007). *Applied Multivariate Statistical Analysis* (6th ed.). *Pearson* Prentice-Hall, Pearson Education, Inc.

Koehler, M. J., & Mishra, P. (2009). What is technological pedagogical content knowledge? *Contemporary Issues in Technology and Teacher Education, 9(1)*, 60-70. https://citejournal.org/wp-content/uploads/2016/04/v9i1general1.pdf

Koehler M.J., Mishra P., Kereluik K., Shin T.S., & Graham C.R. (2014). *The Technological Pedagogical Content Knowledge Framework.* In: Spector J., Merrill M., Elen J., Bishop M. (eds) Handbook of Research on Educational Communications and Technology: Fourth Edition New York, NY: Springer, pp. 101-111.

Kozma, R. B. (2001). Counterpoint theory of 'learning with media' *In R. E. Clark (Ed), Learning from media: Arguments, analysis, and evidence*, Greenwich, CT: Information Age Publishing Inc, pp 137-178.

Kozma, R. & Anderson R. E. (2002). Qualitative case studies of innovative pedagogical practices using ICT. *Journal of Computer Assisted Learning, 18,* 387–394. https://doi.org/10.1046/j.0266-4909.2002.00250.doc.x

Kozma, R. B. (2003). Technology and classroom practices: An international study. *Journal of Research on Technology in Education, 36(1),* 1-14. https://doi.org/10.1080/15391523.2003.10782399

Minister for Innovation and Public Administration-Albania (2015). *Cross-cutting strategy "Digital agenda of Albania 2015-2020*. http://akshi.gov.al/wp-content/uploads/2018/03/Digital_Agenda_Strategy_2015_-_2020.pdf.

Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record, 108(6),* 1017–1054. http://dx.doi.org/10.1111/j.1467-9620.2006.00684.x

Papanastasiou, E. C., & Angeli, C. (2008). Evaluating the Use of ICT in Education: Psychometric Properties of the Survey of Factors Affecting Teachers Teaching with Technology (SFA-T3). *Educational Technology & Society, 11 (1),* 69-86. https://www.jstor.org/stable/jeductechsoci.11.1.69

Prodani, R., Çeliku, B., Prodani, K., (2020). *Use of ICTs In Schools. Case Study: "Korça Region".* In: Dimitriadou, A., Griva, E., Lithoxoidou, A., Amprazis, A., (eds). Education in the 21st Century: Challenges and Prespectives. 4th International Conference Education Across Borders, Florina, Greece, pp. 603-610. https://www.edu.uowm.gr/site/system/files/site/sites/default/files/final_educbr4.pdf

Prodani R., Çobani S., Bushati J., & Andersons A. (2020). An assessment of the factors that influence the use of digital technologies in teaching: A Case Study. *Universal Journal of Educational Research 8(4):* 1453-1460, DOI: 10.13189/ujer.2020.080438.

Senteni, A. (2006). Information and Communications Technology Integration and Developmental Intervention: Enabling Knowledge Creation and Capacity Building in Developing Countries' Organizations. *Educational Technology Research and Development, 54, (3)* 300–311. https://doi.org/10.1007/s11423-006-8811-1

Shulman, L. E. (1986). Those who understand: Knowledge growth in teaching. *Educational Research 15 (2),* 4–14. https://doi.org/10.3102/0013189X015002004

The Open Society Foundations in Albania (2015) *"Integrimi i Teknologjisë së Informacionit dhe Komunikimit në Edukim në Shqipëri"*. https://altri.al/wp-content/uploads/2018/05/Studimi-e-learning-shqip.pdf.

Viherä, M-L., & Nurmela, J. (2001). "Communication Capability Is an Intrinsic Determinant for Information Age", *in Futures, 33(3-4),* 245-265. https://doi.org/10.1016/S0016-3287(00)00070-7