Research Article

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The Role and Importance of ICT Courses in Improving the Learning Outcomes of Pre-Service Teachers

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Abstract

This study shows the importance and efficiency of the use of ICT in the subjects of the field of education. Moreover, the study presents the reasons of students, as future teachers, what has led them to learn technology and what they see as a benefit from the use of new Technologies in Education. The purpose of this research is to identify the importance of ICT courses and the skills that students who complete the faculty of teacher education gain from following these courses. The research also aims to highlight the benefits and opinions of students about the field of ICT in education and its correlation with their success in other study subjects. This paper used a combination of two methodologies: quantitative and qualitative. The data was obtained through a questionnaire that was distributed to the students of the Faculty of Education of the University of Pristina. Our sample consists of 155 students in primary courses, early childhood education, and general pedagogy. The data were processed through the SPSS program through descriptive analysis, linear regression analysis, and one-way ANOVA. The results obtained from this research highlight that the use of ICT has helped the students of these directions to have better results in various subjects of the field of Education since almost all the students (future teachers) strongly supported the use of ICT, considering that the skills gained from following ICT subjects will help them in the future when working as teachers.

Keywords: *ICT courses, learning outcomes, pre-service teacher, improving*

1. Introduction

In the 21st century, technology is having a significant impact and is being used to a great extent in all areas of life in increasing the efficiency of activities and the performance of teaching and learning. Technology is being used as a tool that is also affecting teaching practices that encourage the education and professional development of teachers (Hebert et al., 2021; Hu et al., 2021).
The subject ICT in Education is offered in the primary program that prepares students for teachers from grades 1 to 5, in the Early Childhood Education program which prepares educators for the age group 0-6, and in the general pedagogy program, where students are prepared for future pedagogues, we have the subject "Technological bases of teaching work".

The reason for offering these subjects is the development of digital skills for future teachers,

educators, and pedagogues, however, the aspect of how much students achieve through these subjects to develop the required digital skills and how much these acquired skills help them for achieving and raising the learning results is an issue represented as the objective of this research.

During this time which is considered the modern or digital world, technology is significant in developing and sharing information in various aspects of life, including education. Its usage in classrooms, for instance, will help teachers gain more relevant data as well as assist learners' achievement or performance (Boonmoh et al., 2021).

Despite these studies, it has been shown that there is a gap in research in this particular area. This study aims to address the gap between ICT and future teachers, reviewing the recent literature on two themes: ICT in future teachers, and ICT in other subjects.

2. Literature Review

It is generally known that if we want to have more effective learning, there is the need to have information about various platforms if they can be used and easy to adapt to. Moreover, technology is inevitable nowadays, and almost every person has access to it. Studies have demonstrated the importance of the teacher's effectiveness in teaching students who speak a variety of languages. Therefore, it has been agreed that using technology in language classes is crucial, however, the academic staff claimed that technology-supported apps and tools are absent.

About twenty experienced teachers indicated that introducing technology-based apps to the curricula will solve this concern (Khajayeva et al., 2021). The role of information and communication technology (ICT) in preschool education is a significant topic for researchers (Liu et al., 2014).

According to (Oliver, 2002), students have grown accustomed to studying through transmissive methods earlier moreover, learners were taught to let others communicate the curricular content to them.

The increasing use of ICT as an educational medium is altering and will likely continue to affect many of the learning practices used by both instructors and students.

(Nomass, 2013) Concluded that technology is becoming essential, and the computer is a crucial source of the learning process and a tool for sharing knowledge with participants. Technology has combined the practical and the theoretical part, where through modern methods we can have much more favorable teaching. Every teacher should consider technology as part of his teaching work. Educational institutions should improve their technical education skills by incorporating new technology and laboratories into teaching.

According to (Erbas et al., 2021) technology has an impact on managing to study, making students interested in learning, and letting them study much more than the classroom. It also provides a range of resources, which must be considered. Teachers should have the required info to clarify things with technology. Technology can encourage students to improve their performance, boost their expectations, and save time by searching for different things on the internet. Students understand how to operate a computer and consider this technology as a helping tool to study English and utilize the internet for learning. They believe that the internet is highly beneficial to their English success. Teachers do not utilize technology equipment in the classroom, instead, they use materials from the internet to help students learn English, and students enjoy using technology to study English.

Computers never have to replace teachers as they play a unique role in educating, guiding, and assisting students if resources are secure and acceptable (Dina & Ciornei, 2013).

Teachers had been stumped by young children's technological knowledge. Whereas these instructors stated that they will continue to learn to better their expertise, they had quite diverse views on the problems (Dong, 2018).

Teachers should have knowledge and skills in using computers and give students the opportunities to explore and search for different materials. Teachers should receive government assistance to research and communicate their pedagogical approach to technology in ECE (Frederick

& Esther, 2014).

According to the findings, young teachers have a higher advantageous edge in using ICT than older teachers. However, older teachers are afraid of integrating technology, and only if they had the same knowledge as young teachers, they would incorporate technology much faster and easier in their classrooms (Semerci & Aydın, 2018).

Educators, researchers, and developers must address the negative effects of technology on education although technology has a significant impact on the success and motivation of students to learn. ICT improves student outcomes in some aspects, however, if it is not used efficiently, it will be ineffective in terms of learning new information (Higgins et al., 2019).

According to (Nikolopoulou & Gialamas, 2015), technology is one of the best ways to develop children's skills. Moreover, some of the authors have given recommendations about ICT in education.

During professional development courses, the best decisions must be made each time as to which teaching methods to use to achieve the best possible results in the use of technology (Wasserman & Migdal, 2019). In online learning, many students have made sacrifices to solve some problems even though it may be beneficial (Dumford & Miller, 2018).

Even during online learning, there is a connection between students and teachers since each teacher can answer the questions posed by students (Wasserman & Migdal, 2019).

3. Methodology

Considering that the purpose of this research is to identify the importance of ICT subjects and the skills acquired by students who complete the faculty of education, namely the identification of the benefits and opinions of students for the field of ICT in education and the interconnection with their success, we selected the mixed methodology to conduct this research.

To fulfill the objectives of this research, we raised some research questions and hypotheses which include two themes as problem areas. The first one deals with the attitudes or perceptions of students towards ICT subjects and the second field is focused on the benefits that students have from enrolling in these subjects and the correlation of the acquired skills with the results of learning in other subjects.

The research is mainly based on the current state where two types of data are obtained, those that are collected through the survey and those that present the current state developed so far by different researchers which are obtained from various credible databases such as IEEE, Scopus, Web of Science, ACM, and others.

Therefore, to achieve this goal, we have raised several research questions and hypotheses:

RQ1: What are the students' attitudes towards ICT subjects?

RQ2: What do students think about the effect of ICT on their achievement in other subjects?

RQ3: How much has prior experience influenced the use of ICT for learning?

RQ4: How are they motivated to learn ICT subjects?

Hypothesis

H0: Attending ICT subjects and acquiring the skills in these subjects do not help students to achieve better academic results in other subjects.

H1: Attending ICT subjects and acquiring the skills in these subjects has helped students to achieve better academic results in other subjects.

3.1 Population and sample

The population in this study includes all students of the Faculties of Education in Kosovo, while the research sample consists of about 155 students of the Faculty of Education of the University of Pristina. Quantitative data were collected through a questionnaire made with Google Forms.

Table 1: Demographic data for participating students.

Variables		Frequency	Percent
Gender	Female	148	95.5
	Male	7	4.5
	17 - 20 years old;	98	63.2
Age	20 - 24 years old;	51	32.9
	Over 25 years old.	6	3.9
Total		155	100.0

The questionnaire is divided into four demographic parts: previous experience, what they like and doesn't like about technology, how the students are motivated, and the last part which contains 7 different questions that were measured with a Likert scale with a value of 1-5. During the analysis, the last part was placed in a separate variable where the average of 7 Likert questions was found for this and then it was called 'ICT' in other subjects. The students of the first, second, and third year of the BSc programs, in different departments such as Early Childhood Education, Primary Education, and General Pedagogy, participated in the research. They had prior experience since they had a compulsory course related to technology in Education. The questionnaire is designed in such a way that it contains closed and open questions that are measured with a Likert scale defining values from 1 to 5 (1 – not at all and 5 – very well).

The research sample includes 155 students, 148 females, and 7 males. According to the results of Table 1, we see that 95.5% of the respondents belong to the female gender and 4.5% belong to the male gender. This shows a very high influence of the female gender studying in the Faculty of Education. Also, from the age of 17-20, there are more than 63.2% or 98 respondents, while from the age of 20-24 32.9% or 51 students, and a very small number of 3.9% or 6 students are over 25 years old.

Table 2: Reliability analysis

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.833	.828	9

The methodology of this research is mixed, which means that two methods, qualitative and quantitative, were used. To analyze these data, the statistical program SPSS was used, through which results were achieved using some of the different techniques such as descriptive analysis, linear regression analysis, and one-way ANOVA, while the reliability of the questionnaire was measured through Cronbach's Alpha. Table 2 shows the reliability analysis as a result of which 83.3% of the questionnaire questions were found to be reliable and as such acceptable for research.

4. Results and Discussions

4.1 Student motivation

As can be seen from the results presented in Table 3, in the question of what motivated you to learn technology, 31.0% of respondents learned technology because they were enthusiastic to learn new things, 19.4% of respondents stated that there was a need for the solution of the tasks, 18.1% stated that they needed to learn ICT, 11 (7.1%) answered for the three given alternatives, 30 (19.4%) answered that it was enthusiasm and need, 5(3.2%) enthusiasm and some other reason, and 3 (1.9%) of them had the opinion that the need to solve the tasks and some other reason they learned in the technology course.

Table 3: Motivation to learn technology.

What motivated you to learn Technology? *					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Enthusiasm to learn new things;	48	31.0	31.0	31.0
	The need to solve various tasks;	30	19.4	19.4	50.3
	Other.	28	18.1	18.1	68.4
	Enthusiasm to learn new things; The need to solve various tasks; Other.	11	7.1	7.1	75.5
	Enthusiasm to learn new things; The need to solve various tasks;	30	19.4	19.4	94.8
	Enthusiasm to learn new things; Other.	5	3.2	3.2	98.1
	The need to solve various tasks; Other.	3	1.9	1.9	100.0
	Total	155	100.0	100.0	

Authors (Granito & Chernobilsky, 2012), conclude students will not succeed if they use technology, but need interest and motivation. Also, if a student uses technology have a benefit and others who don't use it may benefit from traditional methods.

According to (Jackson & Songer, 2000) some of the programs like KGS (Kids as Global Scientists) provide excellent motivating and learning opportunities for pupils and others, which have a direct impact on motivation for studying.

(Sandybayev, 2020) Conclude motivation to use technology can show where they need to use it. Uses of e-learning or online sources services have reached better results and students are more motivated to learn.

Based on results and research papers (Granito & Chernobilsky, 2012; Jackson & Songer, 2000; Sandybayev, 2020), students gain motivation to use technology to achieve better results for their work or to solve various tasks.

4.2 Experiences of using technology in other subjects

In Table 4, we see the values presented for the mean, standard deviation, and the number of respondents in the obtained results. Based on the results of the previous experience of using technology, we have a lower and not a very satisfactory average of 2.4% which implies that the first-year students in the faculty do not have a good previous experience in using technology, as well as 2.6% for facilitating the solution of problems encountered during the learning process in other subjects, and it is implied that technology does not always solve the problems that may be encountered in the learning process.

Students of the third year have more experience than the first and second year since during their studies they had technological subjects in advance and they are better prepared and have advanced in researching materials on the Internet and researching how to use different technological devices. However, this does not diminish the fact that even these students did not manage to understand it as was foreseen at the beginning for the subject during the semester and showed an extraordinary result in the end by fulfilling the required objectives.

If we take the research in general, the results have not been a satisfactory value of the average in the previous experience with 2.46% or in facilitating the choice of problems during the learning process in different subjects.

Table 4: Experience and use of technology

Descriptive Statistics			
	Mean	**Std. Deviation**	**N**
Average LR	3.6903	.94595	155
1. Have you had prior experience using technology equipment?	2.4839	.65816	155
2. Has the use of technology during the teaching process at the faculty made it easier for you to solve problems?	2.6194	.60593	155

In Table 5, we present the values of R Square taking as independent variables the previous experience and solving problems with technology, while ICT in other subjects is taken as a dependent variable. This shows the percentage of change in the dependent variable in the independent variables.

So, according to what we see through R Square, we show how powerful the regression model is to explain this change in the dependent variable. Therefore, based on the result, 25.60% of the change in efficiency is explained through two dimensions of the experience of using IT in solving problems or tasks in the learning process by using adequate and necessary techniques. Undoubtedly, technology has a tremendous effect on achieving results in other subjects if it is used to a certain and appropriate extent.

Moreover, one of the main elements that show if there is auto-correlation in the model is the Durbin-Watson value. According to the result (1.50), we notice that our model is clear from the form of autocorrelation and is not influenced by this form so our results are as real and accurate as possible.

Table 5: Model summary

Model Summary b					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.506a	.256	.246	.82151	1.504

a. Predictors: (Constant), 2. Has the use of technology during the teaching process at the Faculty made it easier for you to solve problems? 1. Have you had prior experience using technology equipment?
b. Dependent Variable: Average LR

To see if our model is significant, we analyze the results obtained from the ANOVA analysis in Table 6. The results show that if the value of sig is < 0.5 then the system is significant and, in our case, we have the regression model which is significant and acceptable since the result is 0000 < 0.5. Through the results and the significance shown in Table 6, we say that hypothesis 0 is rejected and hypothesis 1 is accepted since prior experience and attending ICT subjects have helped students in other subjects, and the skills acquired in these subjects with the use of technology have special importance.

Table 6: The difference between experience and the use of technology in other subjects

ANOVA a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	35.221	2	17.610	26.094	.000b
	Residual	102.581	152	.675		
	Total	137.802	154			

a. Dependent Variable: Average LR
b. Predictors: (Constant), 2. Has the use of technology during the teaching process at the faculty made it easier for you to solve problems? 1. Have you had prior experience using technology equipment?

The findings of our research are also supported by the findings from (Ben et al., 2022) which point out

that the using ICT has an impact on the performance of the student, the university has to increase investment in equipment of technology but investment doesn't have an impact. To improve experiences for using ICT, universities have provided training, where these are unnecessary for their needs.

Our findings also are reflected similarly in the study (Moro et al., 2019), where the results show that having elementary knowledge is important. Also, has a link between the understanding, and attention they have for ICT, and which training they need to attend.

The research study (Kennedy et al., 2008) presents that if some of the students are having difficulties while using technology, academic staff have to engage with these students. The study identifies that most of the students (85%) use technology for research objectives, to access the learning management system, to access the web for conferencing, and for everyday life.

Seeing the great impact of technology in every aspect and based on research results and other papers (Ben et al., 2022; Moro et al., 2019; Kennedy et.al, 2008), ICT is an essential part of other subjects to achieve better results in the fastest way.

4.3 Opinions about using ICT

In the questionnaire, students had some open-ended questions where they can write about things they like or not like based on previous experiences with children of different ages, and this is presented in Table 7.

Table 7: Student opinion about ICT

Question	What do students think about this question?
What they like most about ICT in their future profession are:	Provision of material faster, we look for answers easily without having to browse through texts, makes the lesson more attractive for students. It offers us different programs for children that we as educators can use in the future at work. Facilitates teaching; Interdisciplinary links; facilitates the communication of the didactic triangle. The creation of an interactive experience during learning and the learning process, for example with concretization (videos, photos, various applications, etc.), access to the data we need as future teachers as well as students.
What they do not like most about ICT in their future profession are:	The equipment is not present in every class in our country, At times, the student's concentration could be lost. Many sources of information are unreliable. It happens that students become addicted only to the Internet if they use it a lot, they don't surf a lot since they get ready answers on Google. Always ready "easy and fast" is required, also most of the programs that are used to solve tasks, no clarifications are required for the flow of the problems, only results. I don't want them to be dependent as children on technology even though they surround it, undesirable scenes and uninformative games for children, damage to their eyes, and degeneration of their personality in some cases.

Technology has a key role in future teachers' profession. The attitudes of the students towards technology vary based on the answers given in the open-ended questions in which they have shown that they have an easier time in providing the materials, they can find the answers without having to search in the printed texts which is something that saved them a lot of time, next, the use of different programs for children that educators can use in teaching, the connections between subjects and the greatest possibility of communication between the didactic triangle.

In general, what these teachers like is the provision of material, the possibility of using applications in a lesson to facilitate the teaching process, as well as the communication of the triangle

of teachers, students, parents, and other issues. In a study conducted by (Shatri et al., 2021) 162 teachers were subjected to a 9-item questionnaire and a 6-item interview to see the impact of the use of platforms on their teaching, 79.1% of the respondents' teachers declared that they managed to enhance their teaching by using the platform "School Me". Also, in the context of increasing the students' learning per subject, 77.7% of the teachers declared that the use of the platform increases the students' learning for the specific subject.

Based on the given answers, students have also shown their dissatisfaction with technology, where the main concern was the distraction from a lesson.

Similarly, our findings are reflected in the study conducted by (Goundar, 2014) in which 55 students, who studied applied to compute, participated. The results of this study showed that ICT devices can interfere with the engagement of students to learn. Students declared that they using their ICT devices for other things instead of learning during lectures.

Another concern of students was dependence on technological devices and the risk of using applications in solving tasks on the part of students where the students do not try to find the solution themselves and the great possibility of uncontrolled display on the Internet which is very harmful.

5. Conclusion

This paper addressed how ICT could be used to help students advance their skills in different subjects and make it as attractive as possible for the subject

Based on the research and results, it can be seen that ICT has a significant role for teachers and students since it provides support for students to learn what they need by providing the necessary information to achieve their goals in any field

Many researchers have argued that technology will solve major problems in educational curricula. On the other hand, other researchers have highlighted that students have better knowledge of technology and this will help them learn more, unlike teachers who should have better knowledge in clarifying things related to technology.

The same results have been achieved together with other researchers since the key problem of technology in the educational process is the provision of the infrastructure with the necessary equipment, a problem that would be solved with the support of the country's governments.

Based on the results of this study, it was concluded that technology can have different consequences for both, students and children. They can be influenced by misinformation and can misuse technology during the learning process, next, they are addicted to the Internet since for each question they ask for the pre-selected answer, not trying to answer it by themselves first.

Recommendations:

- We recommend that ICT should be used in every possible subject.
- The governments of the country should enable the fulfillment of the basic conditions in providing the infrastructure, for instance, providing a projector, laptop, tablet, smart board, and other devices that come into operation with specific subjects.
- Moreover, we recommend that help should be offered to teachers who are not yet adapted to technology, through training, courses, or even technical assistance during a lesson.

In future work, we plan to conduct a study at the primary, secondary, or university level. The next study will investigate the possibility of using technology in any of the mandatory subjects such as mathematics, the Albanian language, or any other subject, and draw results on what would be the most suitable forms of using technology in teaching subjects as well as achieving success in learning and teaching by both teachers and students.

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