

## ICT as a Didactic Tool to Facilitate the Learning Process in the Subject of Mathematics in Combined Classes

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**ABSTRACT:** Information and Communication Technologies (ICT) has become a common entity in all aspects of life. The use of ICT has fundamentally changed the practices and procedures of almost all forms of endeavor within the learning process. The use of ICT in education lends itself to more learner-centered learning environments, and this often creates some convenience for teachers and students. On the other hand, with the small number of students, schools are facing the merging of several classes led by one teacher. A combined classroom is when students from more than one grade level learn from the same teacher, in the same classroom. Therefore, this study aims to explore the process of integrating ICT into teaching and learning practices in combined classrooms in the subject of mathematics. The study is a qualitative study that focuses on a case of elementary and lower secondary school "River Heroes" in the Republic of Kosovo. In this study, the descriptive survey method was chosen to evaluate teachers' experiences in the integration of ICT in the teaching and learning process in combined classes. The total number of participants in this study was 9 primary school teachers of this school. This particular study used interviews to collect qualitative data. The results of the study show that the use of technology in teaching can be a powerful tool to help students develop their mathematical skills, especially in schools with mixed classes. The results of this study can help the Ministry of Education, Science, and Technology, Municipal Directorates of Education, school teachers and principals, as well as other interested bodies to design intervention and rehabilitative measures related to the integration of ICT in teaching and learning, especially in combined classes.

**KEYWORDS:** Combined class, didactic tool, ICT, learning, mathematics, teaching

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### I. INTRODUCTION

Mathematics is a scientific and behavioral discipline, so every Kosovo has integrated it as a compulsory subject in school education. It is valid in every event of our life. All other sciences and disciplines such as psychology, sociology, philosophy, epistemology, pedagogy, curriculum studies, and science are based on mathematics directly and indirectly. So, this discipline is most important in our daily activities.

A combined class is when students from more than one grade level are taught by the same teacher, in the same class. Students in a combined class follow the expectations for their specific grades. As in single-grade classrooms, teachers use a variety of strategies to ensure that appropriate grade-level curriculum expectations are covered. As in any classroom, single or combined, teachers are supporting students at different levels. In larger schools, there are often many students for one class, but too few for two classes. The reason for creating combined classes is different for each school. Therefore, this study will focus on a small school with a small number of students, and it is precisely for this reason that the combined classes were formed. The combined classes in this school are the first grades together with the third grades and the second grades with the fourth grades. It is difficult for a teacher to work simultaneously with two classes with different levels of knowledge, so in this paper, we will present the experiences of teachers who have applied ICT as a didactic tool to facilitate the learning process in the subject of mathematics in their combined classes.

There is no limit to the application of ICT in education in general and the subject of mathematics in particular. The use of ICT tools in learning activities in combined classes plays an important role. They have the potential to facilitate the learning process provided they are used as effective teaching strategies.

#### A. Purpose of the Research

The range of technology in teaching mathematics is limitless. However, many aspects remain undefined. This research comes with the knowledge that will be applicable in educational practice. The findings will serve as motivation for more frequent use of ICT

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in the teaching of mathematics from the first to the fourth grade as a tool to facilitate the improvement of the learning process in combined classes. Through the application of ICT in the combined classrooms in the teaching and learning of mathematics, the improved technological practice will be explored and discussed which helps to overcome the challenges that arise when trying to realize the learning outcomes according to the educational curriculum in the subject of mathematics.

### **B. Research Objectives**

Specifically, the objectives of this study are:

- to facilitate the teaching process in the subject of mathematics in combined classes through the integration of ICT;
- to identify the challenges that arise in the combined classes in the subject of mathematics, overcoming these challenges through the use of ICT;
- to evaluate the level of ICT integration by teachers in the teaching and learning process in the combined classes in the subject of mathematics;
- to reflect good practices from teachers who have integrated ICT in combined classes in the subject of mathematics;
- to improve the performance of students in the subject of mathematics through the use of ICT in combined classes;
- to create a positive relationship between the integration of ICT in the combined classes to the students' perceptions of the subject of mathematics;

## **II. LITERATURE REVIEW**

Technology has always been at the forefront of human education. From the days of carving figures on rock walls to today, when most students are equipped with some portable technology device at all times, technology continues to push educational capabilities to new levels. Looking at where educational methods and tools have come from and where they will go in the future, the importance of technology in the classroom is evident now more than ever. With the evolution of technology, educational capabilities are growing and changing every day. For those serious about success in the field of education, it is imperative to stay well-informed about current and changing technologies [1].

Combined classes are those classes that include students from two or more classes of the first developmental period of education and basic education, two or more classes from the second developmental period, as well as two or more classes from the third development of education and basic education. With the exception, in schools where there is a smaller number of students, the combined classes are also the class formed by the union of the first five classes. The combined parallels in the pedagogical literature are also called "joined parallels" because they represent a heterogeneous community of students of different age groups (the difference from one to three years), where the teaching is carried out by one teacher [2].

In combined classes, the teacher devotes a large part of the time to the independent work of the students. Through independent work, students identify, deepen, acquire, and apply new knowledge, skills, and habits in an organized and planned manner, with professional-pedagogical assistance and in cooperation with the teacher. Research proves that students who have followed combined classes until the fifth grade, after being included in the higher classes, show a higher degree of independence and flexibility. A well-organized classroom for the combined parallel should: be equipped with tables (two tables), audio-visual and multimedia tools; have didactic, auxiliary, and work materials; in any case, all work materials and all learning resources must be available to students [2]. The findings of the Orhani (2021) study reflect the high results of participants regarding the integration of technology in mathematics lessons and its positive effect on the learning process [3].

The main goal of the national strategy is to maximize and optimize the use of ICT equipment by different categories of potential participants: teachers, pupils, students, and citizens. The promotion of technological education is a logical step, especially in the lower grades of primary education. Special care should be taken in teaching content to different groups of students. Special emphasis is given to the implementation of ICT in primary education for the performance of school tasks and not as an end in itself. The implementation of interactive teaching requires various learning aids, convenient space for work, interior arrangement, training of teachers to implement interactive teaching, training of students, and others, which means that it depends on many important factors. To change the picture of traditional teaching as a very important issue is the introduction of innovations in teaching. In the practical theories of didactics, the position of changing passive learning to active learning has been accepted. The active way of organizing learning characterizes contemporary learning, while the passive way characterizes traditional learning [4].

Digital technologies can enter primary education systems at different levels: as tools to support student learning, within the classroom, at school, or home; as tools to support teachers, whether for teaching or non-teaching activities, inside and outside the classroom [5]. One of the benefits of ICT education from the student's point of view is the increase in motivation. It is difficult to motivate students in a classroom where they simply copy what is written on the blackboard into their notebooks. However, the use of digital devices, such as tablets and PCs, can give students a new perspective on the classroom. Jones and Preece (2006) reported that both students and teachers need to learn to trust technology for technological performance as well as increase uptake

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and reduce resistance to technology. Teachers need to be confident and competent in using different ICT tools to build their confidence in technology [6].

ICT can be applied in all subjects, including mathematics. According to Keong et al. (2005), 89.5% of mathematics teachers use basic ICT applications in their teaching [7]. These core applications include training software, visuals, and online demonstrations. These apps work as teaching aids in mathematics. This shows that teachers' ICT skills have increased in applying various technological applications in their teaching process [8]. The application of information technology can also increase students' motivation and interest in mathematics [7, 9].

### III. METHODOLOGY

#### C. Design of study

This study aims to explore the integration of Information Communication Technology (ICT) in the teaching and learning process, as important constructs for the development of a teaching strategy in combined classes. The study is a qualitative study that focuses on a case of the primary and lower secondary school "Heronjtë e Lumës" that the researchers work on. In this study, the descriptive survey method was chosen to evaluate teachers' experiences in the integration of ICT in the teaching and learning process in combined classes. This method of study is also important together with detailed descriptions of the existing state and current practices of an educational phenomenon. According to Creswell (2009) a descriptive study is "a study in which the researcher explores the entity or phenomenon limited by time and activity and collects detailed information using a series of data collection procedures over a sustained period" [10].

#### D. Sample of the research

The respondents included in this study were the teachers of the primary and lower secondary school "Heronjtë e Lumës" in the three parallels separated in the village of Vërmicë, Shkozë, and Dobrushtë of the municipality of Prizren in the Republic of Kosovo. The selection of the sample was a purposive one since primary school teachers work with combined classes. Therefore, the total number of participants for this study was 9 teachers of the primary cycle of this school who worked with the combined classes 1 and 3, or 2 and 4.

#### E. Data collection and analysis

This particular study used interviews to collect qualitative data. During the interviews, the researchers distributed questions to the participants to answer in writing to gather some information from the interviewees. The broad aims of the interview schedule were to explore: Teachers' perceptions of relative successes in these combined classrooms, problems and challenges of working with the integration of ICT in teaching and learning, change over the study period in teachers' approach to the inclusion of the use of ICT in their practice and how this relates to student learning, change over time in teachers' views of ICT in teaching and learning, and teachers' views of the processes they experienced while using it of ICT as a didactic tool to facilitate the learning process in the subject of mathematics in combined classes.

The data collected through different instruments were organized and presented narratively. Finally, the results of the analysis were interpreted to answer the main research questions. The study can make decisions about the choice of method, how they are applied, and in which units they are applied. This may involve several back-and-forth steps between data collection and analysis, where new knowledge and experience may lead to adaptation and expansion of the original plan. Some insights may also require a revision of the research objectives. The process ends when saturation is reached when no new relevant information can be found. For reasons of transparency, it is essential that all findings, as well as the underlying reasoning, are well documented.

### IV. RESULTS

Below we present the results of our study from the interview of nine teachers who work or have worked in combined classes and who have integrated ICT in the subject of mathematics:

#### # Interview with teacher 1

Technology can and does help the student to develop all kinds of skills from the simplest to the most complex ones in the subject of mathematics, especially in those schools where the lesson is held with combined classes. However, for the technology to be successful, the teacher must make informed choices regarding the didactic pedagogic approach, student needs, and learning outcomes as well as planning and organizing the learning process for the mathematics subject where learning takes place in a combined class. For the teacher, as important as it is to know what he will use technology for, it is equally important to know how learning in the subject of mathematics can be improved through technology.

The integration of technology in the classroom means many things for the teacher, where during the preparation of the lesson with a combined class, he analyzes the progress of the lesson by asking himself questions:

- Do I use the computer in the classroom to manage, reinforce and facilitate the issues I have explained?
- Do students use the computer to find information, patterns, and methods to help them choose problems in math tasks?

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- Do I use technology in teaching to organize and manage the course of the lesson?
- Do you use PowerPoint, Excel, Word, etc. to plan, organize and manage the lesson?

Although there is no didactic-pedagogical method for organizing the lesson with combined classes, then the organization, plan, program, and planning of the lesson are organized by the teacher himself. To ensure that technology tools are used effectively, the teacher must use them through the implementation of appropriate teaching theories, facilitating the organization of the lesson where with the help of technology tools, mathematical applications will it helped that at the end of the lesson, the teacher managed to achieve the objectives and goals of the lesson with a combined class.

An example of the use of technology is simulations through mathematical computer games, quizzes, mathematical applications, etc., where the teacher engages one class during the lesson, where the students better develop critical thinking and problem-solving skills, while with the other class they develop the learning unit, so as long as the students of one class are engaged in completing tasks through technology, it will be more difficult for them to attract attention until the teacher develops the learning unit with the other class since they have limited time and must complete the tasks given through applications and different forms from the teacher. The use of technology with combined classes, especially in the subject of mathematics, is necessary for the students as well as the teacher, where it will be easier to hold the lesson. By using technology in the constructivist approach, teachers find it easier to involve students in learning activities. They can create activities for different levels and learning styles and can expand the range of information available to the student.

### *# Interview with teacher 2*

Technology is one of the main didactic tools that is being used today in the entire educational system and not only in combined classes. Working with combined classes is not an easy challenge, the difficulties faced by teachers who work with combined classes are many, starting from planning to managing a lesson in a combined class. The very way in which the combined learning takes place causes attention disorder and a lot of surprises in the students. To work with a combined class, the teacher must be very attentive, flexible and systematic, for the reason that during a lesson you will have to move from one subject to another and vice versa, first instructing the students who need it most for instructions and those who need a longer time to complete an activity, or often even younger students, example first grade first and then be guided by third grade, or depending on the planning and type of technique that the teacher will use during the lesson. Personally, technology has helped me a lot and continues to help me in the learning process. In the first period, I worked with the "Alphabet" application, this application is available in two languages, Albanian and English. The application contains a variety of activities for children such as Alphabet, Mathematics, Rhymes, and Quiz. During the mathematics lessons, in the last part of the lesson, the students had fun and learned a lot from the mathematics part. If we open this part, we will be able to see several subdivisions where they belong: Numbers, abacus, sequence, addition, subtraction, multiplication, and division. The use of this application has helped me tremendously, because the first graders have remembered numbers, counting, and sequencing much more easily, now we are learning addition and subtraction and we go continuously simultaneously with the use of the application in question. Also, the application " Math Board" is a great app that I use with first and third grades. This application can be used in two languages as well, and you can work with and without music while using it. In this application, Mathematics is divided into four parts: Addition, subtraction, multiplication, and division. Each section contains 10 lessons and each lesson we click on contains some tasks, which if the student does not give a correct answer, he has the opportunity to improve or delete the answer as well as to reach the correct result of the task, where At the end, the students are motivated with a motivational word such as: Perfect, very good, super, etc. With the first grade, I usually practice addition and subtraction and with the third grade, we practice multiplication and division, which makes my job much easier for the students to learn easier, better, and remember longer. Also, with the use of such applications, the student's critical thinking is awakened, a skill that comes as a requirement of the 21st century. The use of technology helps in the teaching process in many areas and directions, the benefits it brings us today, I believe many that will bring many benefits to us in the future as providers of the educational process, but also to the students who enjoy the benefits of these services and receive knowledge from us every day.

### *# Interview with the teacher 3*

The need to master digitized teaching has become essential for all subjects, especially the subject of mathematics. It is very important that teachers who are not yet able to use technology, are motivated to search and use online resources (laptop or tablet), through training so that teaching is as effective as possible for students. Teachers should be able to use resources such as websites, blogs, various applications, and digital tools which help them to successfully transition and implement the lesson plan and curriculum from direct classroom instruction to digitized learning through activities, using and engaging students with technological tools such as computer, laptop, tablet and especially more than necessary when it comes to teaching with combined classes in the subject of mathematics where the use of technology is ideal for facilitating and organization of the work and learning process in the classroom.

Educational-educational work in parallel with combined classes also imposes a certain number of challenges:

- Work with multiple classes simultaneously in one class.

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- Preparation of teaching materials for all subjects and for all classes.
- Paying attention to students who learn slowly.
- Continuous monitoring of activities and tasks in parallel.
- Greater attention is paid to evaluation.
- Greater attention is paid to the distribution of activities and good assessment of student achievement.
- Great pedagogical documentation and evidence.

The use of ICT in teaching, with combined classes in the subject of mathematics, increases the quality of teaching, represents a very important strategy for increasing the knowledge of students in learning, and offers opportunities for improving the educational system in teaching. For this reason, it is recommended to apply new teaching and learning methods by integrating ICT in the mathematics subject, when the lesson is held with combined classes. To realize such hours, the following equipment is needed: A computer; Printer; Smart boards; Video projector; Internet installation; Software applications for the subject of mathematics; Electronic books, etc.

The development of technology and the digitization of teaching materials are two factors that are positively affecting teaching, where this is practically observed during work with students with combined classes in the subject of mathematics, in the school where I work as a teacher. By encouraging engagement and interaction, not only in the traditional format but also in the virtual environment, the learner plays an active role in building knowledge and developing their skills. Students in classes where ICT is regularly used actively participate in learning are more inquisitive and research, engagement, and interest increase, especially when various mathematical applications and games are used to encourage, seek and develop mathematical knowledge.

ICT has greatly influenced and is influencing the way education is delivered, as it has the potential to provide, facilitate and guide students in lifelong learning, full participation in society, and success in professional life. The fulfillment of this goal dictates the development of knowledge and digital skills of students and teachers. Students, today, live and grow in a digital world, however, they also need support in the development of digital competence. However, the biggest challenge is for teachers because everything is expected from them as to how much and how much they can transmit that knowledge to the students. In addition to ICT skills necessary for everyday life, teachers need specific digital competencies that enable them to use technology to support, improve and transform the teaching-learning process, as well as for other responsibilities in school. All this innovation, in the field of teaching and learning, in combined classes has the advantage of use because the teacher saves time to devote to the other class, reduces the teaching noise in the classroom, and increases the students' abilities for independent work in tasks and independent results. The student becomes skilled in the use of ICT, learns and researches a lot about a certain task using the Internet, without hindering the teacher, who at the same time may be working with the other class, etc.

On the other hand, the use of ICT can leave students passive in the development of critical thinking, in solving mathematical tasks, because they don't say for nothing that "mathematics is the sea", considering that often a task has many ways of solving, while the students remain hostage to those methods known by the technology formula!

However, the coming years will better prove the ideal function of adequate teaching and learning using ICT, whether success is achieved in combination classrooms using ICT or not. Likewise, digital work in the field of teaching always has complements and gaps, which in some cases facilitate the work of the teacher, but which distances the closeness and cooperation and closeness, perhaps even emotional, of the teacher with the student. The teacher may not convey the steps of the educational achievement process to the students, because often the students are very skilled at copying formulas and rules in solving tasks, which has negative effects on the development of learning and the student. However, time evolves, science progresses, and with it the forms of work change. Digital time is imposed and served on us in work and life. So we remain to advance in the use of ICT, but not to replace the electronic brain with the biological brain, which served us and invented the digital complex in the world.

### *# Interview with teacher 4*

Learning is one of the forms of knowledge, which man has inseparable from life, learning in all areas of life, such as in school, society, in various sciences, in sports activities, etc., which makes this type of learning continues throughout his life. Organizing lessons in combined parallels is not easy. This type of organization in the school system requires great sacrifices and difficulties as well as great commitment and full will so that the success of the students as well as the success of the learning organization is not lacking. The teacher in this type of organization of the lesson faces many challenges because it has to do with the development of the lesson with two classes. ICT as a didactic tool has greatly facilitated my work with combined classes in all subjects, especially in the subject of mathematics. A subject that requires concentration and commitment in class. ICT applications have helped me to make the teaching units easier to understand by the students. One of the applications used Big Math Flash Cards. In this application, I have used Operations: addition, subtraction, multiplication, and division. Pickup, drop off with first class. This app is very impactful and entertaining for students. With the use of these applications, I think that the student's mental abilities and skills are developed. As well as the habits of critical thinking which is a cognitive, active, and interactive process that simultaneously develops many levels of thinking.

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### ***# Interview with the teacher 5***

The development of technology in recent times is increasingly affecting the improvement of teaching and learning. Therefore, using Tik as a didactic tool in combined classes can help us a lot in time management, which is a challenge in itself when you have to work with two classes of different degrees at the same time. Using ICT during math class has helped me many times. Knowledge should be built and not transmitted to the student, and this is best done through activities and personal experiences created by the students themselves, visually and practically. One of the lessons when I used ICT is during data work where we used pie charts and bar charts to represent data. In addition to the materials given in the book, we also used various videos, but also the Word program to show concrete examples of how these diagrams are added. We have also completed the diagrams with concrete data. I used this when combining classes 1 and 3, exactly with class 3 when working with data. While with class 1, during this hour I continued with different activities, because during the use of ICT, specifically the Word program for the presentation of data by the students of class 3, I was able to have more time available for the next class. I also used ICT as a didactic tool during the lessons when we had logical tasks, through the PowerPoint program, which helped me create and then use those tasks and images during the lesson. During these logical hours, I tried to make the tasks common to both classes but always adapted to the psychological abilities of the students of both classes. I can't say that there has always been success in using ICT as a didactic tool during mathematics class, it can sometimes be a bit challenging and elusive, considering the age of the students and their knowledge of technological devices. My recommendation is that the use of ICT during the mathematics lesson takes place even more as a push and support for us teachers with combined classes and not only, but also in teaching with a single class.

### ***# Interview with the teacher 6***

The development of technology in recent times is increasingly affecting the improvement of teaching and learning. Therefore, knowing that it is a bit difficult to manage time during combined learning, therefore using ICT as a didactic tool in combined classes can help us a lot in managing time, which is a challenge in itself when we have to work with two classes different degrees at the same time. If the use of technology is used in combined teaching, it can improve learning processes and increase motivation to learn. Finding appropriate ways to use technology in education is also a challenge, but the use of technology during math class has helped me many times. I used the use of ICT in the subject of mathematics during fractions, where at the same time together with the students we used different figures related to geometry and geometry figures. We also did the coloring to distinguish the faces of the geometric figures. I used this when combining classes 2 and 4, exactly with class 4.

While with class 2, during this hour I continued with different activities because while using ICT with class 4, I was able to have more time available for the next class. I also used ICT as a didactic tool during the hours when we had exercises, through the Word program, which helped me compile the tasks and then choose the tasks. During the compilation of the tasks, I tried to make them more or less common for the two levels of classes but always adapted to the psychological abilities of the students. Sometimes the use of ICT can also be unsuccessful, it can be challenging and something elusive for students, always taking into account the knowledge about the technological devices they have. I think that by using technology and the constructivist approach together the teacher ensures better integration and utilization of technology tools in the classroom in appropriate and effective ways, giving teaching and learning the necessary tool to improve the learning methods that focus on their students. I recommend that the use of technology in the subject of mathematics is as close as possible to us, especially for us teachers with combined classes.

### ***# Interview with the teacher 7***

Teaching is one of the most noble professions, it requires a lot of effort and dedication if we want to achieve the desired success in the classroom. Students and generations differ from each other, each generation and each student present a difference in itself, often teachers face many problems and find themselves in front of an unenviable situation, this often happens with students who are weaker in terms of learning. Teachers should be able to help students in any way and way that suits them best. As an older teacher, my working methodology differs slightly from that of the younger generations, technology has been one of the main challenges I have encountered during the teaching process, I am aware that people need to progress and be flexible teachers who keep pace with the times, but age itself sometimes does not allow us to do such a thing and as a result, we suffer this lack of digital competence all the time. The integration of technology in the teaching process is a need of the hour, but I try a little to avoid technology knowing my skills in using technology. In the subject of mathematics, during my experience, the calculator has helped me a lot, usually, the students have solved their tasks and at the end after the test they have done they also looked at the result on the calculator, in this case, they have learned to use the calculator and at the same time they also looked at their results, finding the square root and many other things, finally the students are also using different applications, from which they get different tasks that we practice in class and together we learn as much as possible and we clarify things, leaving no room for doubt.

With the help of colleagues who are part of the professional activity of the school, during various holidays and organizations, together we find the solution to various tasks using the projector, this is done by setting the task on the projector and the students

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find the result of the task, then we look at the result of the task together, and this makes the students experience different emotions at the same time.

### # Interview with the teacher 8

In the beginning, the teacher told us that she is a primary school teacher who has been working in combined classes for several years and during this time she has tried to use ICT in teaching. She says she has encountered some technical problems with the computer and feels powerless to deal with these additional challenges. The teacher acknowledges that some aspects of mathematics may be easier to learn through technology, such as math apps or software. She says she would be open to taking part in training to improve in this aspect and to make an effort to use technology more in her teaching in the future. She further went on to tell us that she has realized that combined classes are different from grade-separated classes and that this factor makes it more difficult to use ICT in teaching. She emphasized that in these classes, there are students with different skill levels, and this affects the way she develops the lesson and uses the teaching materials. Finally, she concluded that while she uses ICT in teaching, she is always looking for opportunities to improve teaching and ensure that all her students are successful in teaching.

### # Interview with the teacher 9

ICT is an important tool in teaching mathematics, as it can help students understand concepts and develop their mathematical skills in ways that are not possible with traditional teaching tools. Technology can provide a wide range of applications and software that can help achieve teaching objectives. I used a wide range of apps and software to help students learn math in different and appropriate ways in combined classrooms. For example, we use programs for drawing and geometry, applications for, and software for solving various mathematical problems. In addition, use the Internet where students can find exercises, instructional videos, and other necessary materials. I have noticed that students are more motivated to learn mathematics when they use ICT in these classes. If they feel more involved in teaching and have the opportunity to experiment with concepts in different ways with one class and other concepts with the other class, where they are more interested in learning and exploring the subject. In addition, by using ICT, they feel more willing to take responsibility for teaching and feel more independent in their way of learning.

Below we present a table that describes the connections between the indicators reflected by the findings of interviews with teachers working in classes combined with those topics and concepts from the use of ICT in the subject of mathematics in these classes:

**TABLE 1. SUMMARY OF FINDINGS**

Indicators	Subjects	Concepts
Using applications and technological tools to achieve learning goals	Mathematical applications	Development of mathematical skills
The use of ICT can help students develop technical and technological skills and prepare them for the future.	Discovering technical skills	
If students are using ICT in creative and innovative ways, to solve problems, develop projects and products, and express themselves in different ways, this shows that they are using ICT skillfully and intelligently.	Students' creativity	
ICT can change the way a subject is taught, giving students a different and improved learning experience.	Changing the pedagogical approach	Pedagogical approach
The use of ICT can create opportunities for interactivity between teacher and student and can encourage a more engaged environment.	Interactivity	
ICT can help teachers personalize teaching to meet the needs and levels of each student	Personalization of teaching	
The use of ICT in combined classrooms can help create a contemporary environment among students, allowing them to collaborate and communicate with each other in a variety of ways.	Contemporary Teaching and Learning	Digitized teaching
ICT can help teachers to evaluate the best teaching and more easily identify the views of students regarding a certain topic.	Best teaching assessment	
If students and teachers are using their technology time effectively and productively to retrieve information, analyze data, and use various programs, it shows that they are getting the most out of the technology available.	Effectiveness of time used	

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ICT can help increase interest and motivation for learning through the use of multimedia materials and educational games	Increasing interest in learning	Motivation and support of the learning process
ICT can encourage collaboration between students and create opportunities for sharing knowledge and experiences.	Encouraging cooperation	
ICT can help increase student engagement by allowing them to use many different methods to learn and create new material to present in class.	Increasing student engagement	

### V. DISCUSSIONS

In this part of the paper, an attempt is made to explain the results of the study regarding the basic research objectives of the underestimation problem. It is important to explore, describe and explain the issues/challenges that contribute to the use of technology by teachers of combined classes, and how they develop and disseminate effective ICT practice in the mathematics learning environment. In other words, there is a widespread belief that ICT has an important role to play in changing and modernizing education systems and ways of learning. However, there is little scientific evidence for the concrete contribution of ICT in the field of learning in combined classrooms, despite the efforts of the last decades. Therefore, there is a need to pool evidence on the impact of ICT in combined classrooms. This is also the purpose of this study, to investigate the improved technological practice which helps to overcome the challenges that arise when trying to realize the learning outcomes according to the educational curriculum in the subject of mathematics in the combined classes.

The findings of the study show that the teacher interview describes that the use of technology in teaching can be a powerful tool to help students develop their mathematical skills, especially in schools with mixed classes. However, to use technology effectively, the teacher must make informed choices about the pedagogical approach, the needs of the students, and the planning of the teaching process. The teacher must analyze the progress of the learning process and decide whether technology will be used for managing, reinforcing, and facilitating tasks, as well as for finding information and solving mathematical problems. The use of technology can be done through simulations, quizzes, and mathematical applications, which help develop students' critical thinking and problem-solving skills. To achieve the objectives of the teaching process, the teacher must apply appropriate teaching theories and organize the organization, planning, and program of the teaching process with the help of technological tools. Likewise, other findings emerge from the interview with a teacher who works with combined classes and sees technology as a helpful tool in managing the challenges that come with such classes. She explains that teaching mixed classes can be a difficult challenge, as the teacher must be attentive, flexible, and systematic in switching between subjects and age groups. The teacher personally uses the "Alfabeti" application, which contains a variety of activities for children in Albanian and English, and the "Math Board" application, which can also be used in both languages and includes four sections: addition, subtraction, multiplication, and division. The teacher finds that these apps have helped her students learn and retain information more easily, and she uses them to motivate her students to get the answers right. On the other hand, a teacher emphasizes that the use of ICT in teaching has become a necessity to improve the quality of teaching, especially in the subject of mathematics in combined classes. The use of ICT can facilitate the organization of work and classroom activities, helping to achieve learning objectives and increasing student motivation. However, this process challenges teachers in adapting traditional teaching methods to the context of digital learning. Ongoing training and support are essential to enhance skills and ensure effective and innovative teaching in combined classrooms. The use of ICT can reduce the teacher's working time and allow students to develop their skills, playing an active role in building their knowledge and skills. For teachers, the use of ICT is an opportunity to support, improve and transform the teaching-learning process, becoming more effective and interesting. Based on the response of the respondent, it seems that ICT is a good didactic tool to facilitate the learning process in the subject of mathematics in combined classes. The respondent indicates that the organization of learning in combined classes is challenging and requires great sacrifice and commitment from the teacher, but that ICT has helped to overcome these challenges. The respondent also indicates that ICT applications, such as Big Math Flash Cards, have helped students' understanding of learning units and have influenced the development of their skills and abilities, including critical thinking. This suggests that the use of ICT can be a useful solution to the challenges teachers face in organizing learning in combined classes. Also, other findings show that the use of ICT as a didactic tool in the subject of mathematics in combined classes can help in managing time and building knowledge through the activities and personal experiences of students. Through the use of ICT such as Word and PowerPoint, students can create diagrams and logic tasks, adapting to their psychological skills. However, the use of ICT can be challenging in some cases, taking into account the age and knowledge of the students about technological devices. It is recommended that the use of ICT takes place as a push and support for teachers in teaching combined classes and not only in teaching with a single class. In this interview, a teacher tells about her experience in using technology that can help improve learning processes and increase motivation to learn. She also talks about some of the activities she has done in the classroom using ICT, such as using geometric shapes and colors to help students understand concepts better. The teacher notes that it is challenging to incorporate technology into education, but by using the



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constructivist approach, the teacher can ensure better integration and utilization of technology tools in the classroom in appropriate and effective ways, giving teaching and learning the means necessary to improve learning methods which have their focus on students. She also recommends that the use of technology in the subject of mathematics be as close as possible to the students and adapt to their technological abilities. An elderly teacher talks about the challenges he encounters in the teaching process, especially regarding the differences between the generations of students and the need to be flexible and adaptable to them. He also asserts that technology is a major challenge, but that its integration into the teaching process is the need of the hour. In the math subject, the teacher says that he used the calculator to help the students solve problems and that now the students are also using different apps to practice and learn more. The teacher also talks about collaborating with colleagues to find different solutions and using the projector in combined classes to solve tasks. Our findings suggest that combined classrooms are different from graded classrooms and this makes it more difficult to use ICT in teaching as there are students with different skill levels. However, she is always looking for opportunities to improve instruction and ensure that all of her students succeed in her teaching. By using different apps and software, the teacher can help students understand mathematical concepts in different ways. Also, using the Internet as a source of information can help improve students' mathematical skills. The use of ICT can influence students' motivation to learn mathematics and become more engaged in teaching. Ultimately, the use of ICT can help students feel more independent in their learning and feel more ready to take responsibility for their learning.

### **VI. CONCLUSION**

The findings of the study show that the use of technology in teaching can be a powerful tool to help students develop their mathematical skills, especially in schools with mixed classes. However, to use technology effectively, teachers must make informed choices about pedagogical approaches, student needs, and lesson planning. Teachers must analyze the flow of the learning process and decide whether technology will be used to manage, reinforce, and facilitate tasks, as well as for finding information and solving mathematical problems. The use of technology can be done through simulations, quizzes, and mathematical applications, which help develop critical thinking and problem-solving skills in students. To achieve the objectives of the learning process, the teacher must apply the appropriate teaching theories and organize the organization, planning, and program of the learning process with the help of technological tools. The use of ICT can facilitate the organization of work and activities in combined classes, helping to achieve learning objectives and increasing student motivation. However, this process challenges teachers in adapting traditional teaching methods to the context of digital learning. Ongoing training and support are essential to enhance skills and ensure effective and innovative teaching in combined classrooms. The use of ICT can reduce the teacher's workload and allow students to develop their skills independently, playing an active role in their learning.

In general, the digitization of teaching and learning is a step forward in providing a better educational service that can facilitate and guide students in their lifelong learning and their preparation for everyday life and professional career.

Future research would do well to examine the integration of ICT into the teaching and learning practices of teachers in all schools working with combined classes across the country and all subjects. More reliable and valuable information can be found if one can do this. However, due to time, financial and material constraints, as well as to make the study more manageable and to complete the study within the available time, the dimension of this study was limited to the primary and lower secondary school "Heronjtë e Lumës".

### **VII. RECOMMENDATIONS**

- Our recommendations are that educational institutions develop substantive policies to integrate ICT into the teaching and learning of mathematics in combined classrooms.
- Our recommendations are that the integration of ICT should be a priority in the teaching and learning of mathematics in combined classrooms.
- Our recommendations are that teachers should be empowered to model their pedagogy on the possibilities of ICT in the learning process in the subject of mathematics in combined classes.
- Our recommendations are that ICT be made available on an equal basis for use in improving student learning in mathematics in combined classrooms.
- Our recommendations are that the use of ICT is useful and facilitates pedagogy for students of combined classes in the subject of mathematics.

### **VIII. IMPLICATIONS**

The findings of this study provide important information for the integration of ICT in the teaching and learning process in combined classes. Therefore, the result of this study can help the Ministry of Education, Science, and Technology, Municipal Directorates of Education, school teachers and directors, as well as other interested bodies to design intervention and rehabilitation measures related to the integration of ICT in teaching and learning. Furthermore, the implications that emerge from this study have the following importance:

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- ✓ It can provide policymakers and education officials at institutional levels with information about the integration of ICT in teaching and learning practices in combined classrooms;
- ✓ It can help teachers to improve their teaching methods by minimizing the factors that hinder the integration of ICT in the teaching and learning practices in the combined classes in the subject of mathematics;
- ✓ It can help educational leaders to make the necessary follow-up regarding the integration of ICT in the teaching and learning process in combined classes;
- ✓ It can initiate, encourage and serve as a stepping stone for further and wider research in the integration of ICT in pedagogy/teaching and learning in combined classrooms;

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