THE INTEGRATION OF INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) INTO THE TEACHING PROCESS: PRACTICES, CHALLENGES, AND OPPORTUNITIES

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Abstract

Digital technology brings a range of new opportunities to school life and to transform the way teaching is delivered and how students construct the learning process. The use of digital tools, learning applications, online learning platforms, and various online resources enables broader and more personalized access to information, increasing student motivation and participation *(Hoffman, Paek, Zhou, & Türkay, 2021)*. School leaders, by guiding and supporting the use of technology, help create more interactive and engaging teaching, fostering student involvement and motivation, and enabling the development of higher-order thinking skills. When leaders change their approach to technology, they create a more conducive environment for the development of students' digital skills. By encouraging and supporting the integration of technology into teaching, school leaders help teachers use it productively, contributing to the development of students' digital competencies *(Miguel-Revilla, Calle-Carracedo, & Sanches-Augusti, 2021)*. Likewise, teachers who encourage and support technology integration help students use it productively and develop their digital competencies.
In this way, not only is the provision of specific knowledge by teachers facilitated, but the development of students' critical skills, such as analysis, problem solving and collaboration, which are key to the development of cognitive and social competencies, is also promoted.

Keywords: *Information and communication technology, digital competence, school, approach, integration.*

1. Introduction

The purpose of this paper is to examine the relationship between the use of Information and Communication Technology (ICT) and the improvement of teaching and management of the teaching-educational process.
Improving teachers' approach to the use of technology is essential to developing education that is more appropriate for young people of Generation Z. This approach affects the quality of education by supporting more appropriate teaching, developing deeper digital skills, and expanding collaboration. Together, these improvements make education more effective and better suited to students' current and future needs.
Another aspect of great importance in the use of technology in teaching is the improvement of communication and interaction between teachers, students and parents. School leaders and pedagogical staff can implement systems that facilitate the sharing of teaching materials, the distribution of tasks, as well as the implementation of continuous assessment processes, including portfolio and summative assessment.
This makes it easier for all stakeholders to monitor progress and make necessary changes whenever necessary *(Ackermans, Rusman, Nadolski, Specht, & Brand-Gruwel, 2021)*
The digital competencies of school leaders are of paramount importance in today's world, where technology and especially Artificial Intelligence are becoming an integral part of our daily lives *(Wharton-Beck, Chou, Gilbert, Johnson, & Beck, 2024).*
Studies have shown that school leaders with advanced digital skills can help teachers use electronic tools and resources effectively, improving teaching and learning both inside and outside the classroom *(Levin & Schrum, 2014).*
These leaders can encourage teachers to use different platforms to give students varied, interactive learning experiences and integrate technology into the curriculum. Their digital

competencies also help them support teachers in adapting lessons to students' different learning styles and skill levels, creating a learning environment suited to each student's needs.
This adaptation increases student involvement and motivation in learning, contributing to a more efficient and productive learning process *(Schrum, Galizio, & Ledesma, 2011).*
The use of technology and digital resources by school leaders and teachers helps explain complex concepts in an understandable and engaging way, making learning more successful and interesting for students. Leaders who recognize and promote the use of technologies such as virtual realities, various simulations, and other technology products in the classroom can help teachers better illustrate difficult concepts, creating a more engaging and real-life experience for students *(Schrum, Galizio, & Ledesma, 2011)*. Furthermore, digital competencies enable leaders to broaden their professional horizons and be prepared for the challenges of a rapidly changing education system.
These competencies are not only tools for improving teaching, but also catalysts for change and progress in the field of education *(Gerard, Bowyer, & Linn, 2010)*. Leaders with these skills have the opportunity to adapt to frequent technological changes and use them to create a richer learning environment, influencing not only the development of teachers' and students' digital competencies, but also the growth of their personal and civic skills *(Milman, 2020)*.

2. Methodology

2.1. Research approach and participants

This study uses a mixed methods approach, combining a review of the literature on ICT integration in school life, classroom management, and inclusive development with a quantitative method. The paper draws on the results of a quantitative instrument and case studies (surveys) conducted at the Resource Center for Deaf Students during lessons in English Language, Albanian Language and Literature, Geography, Sign Language, Biology, Cultural Heritage, Life Skills, and Mathematics in grades VI–XII.
The population of this study consists of teachers of these subjects. From this population, a certain number of teachers were randomly selected using probabilistic sampling using the stage method *(Israel, 2009)*, who will also be the sample of this study, which means that from the selection of subject teams, subjects are randomly selected and then the study sample is selected. Labels with the names of subjects that offer the opportunity to use ICT are inserted into a box. The names of the teachers and the classes where they teach are randomly drawn.

2.2. Case studies

This study also had several objectives, which are:

- Assessing the relationship between the use of ICT and student motivation during the learning process.
- Assessing the relationship between the use of ICT and student achievement results.

To address these objectives, observations made before and after the use of ICT and the application of various computer programs will be compared. This comparison will examine whether integrating ICT into the learning process helps achieve positive results and improve the quality of teaching.
Research Question No.1: Is there a positive relationship between the use of ICT and improving the quality of teaching, in support of student achievement outcomes?

2.3 Questionnaire analysis

As mentioned above, with the teachers who were observed, a quantitative instrument was developed on Google Forms where they expressed their opinion regarding the use and integration of ICT during the teaching process. The instrument contains seven questions, four of which are organized with a Likert scale and three are open-ended. The questions were about the use of technology during teaching, assistance, challenges and difficulties in the context of the specifics of our school.
To the question: What technology platforms or tools have you used during teaching? The teachers answered:

- Platform "I learn"- two answers
- Canva, power point - two answers
- ChatGPT, YouTube – two answers
- Geogebra, Google Earth - two answers
- Various- three answers
- Tablets (for using images) Communication boards - one answer
- Google classroom platform, Microsoft teams, smart boards- one answer.

Some of the answers to the question:
What have been the main benefits you have encountered while using assistive technology in teaching? What about the difficulties?

Benefits:

- Some of the main benefits have been the facilitation of the learning process, increased student involvement, and the ability to adapt materials to their needs. Assistive technology helps with communication, better understanding of information, and increased student independence.
- I have not encountered any difficulties.
- Opportunity for lifelong learning, flexibility in time and place. There were no difficulties. The benefits are high because you have different opportunities.
- Increases students' independence in completing tasks. Facilitates communication between teachers and students. The benefit has been the integration of subjects.

Difficulties:

- Cost of training, mismatch with real needs.
- The difficulty lies in the lack of digital equipment.
- The difficulties are related to the lack of appropriate equipment, limited knowledge of their use and the need for more training and technical support.

3. Development of ICT in Albanian pre-university education.

In the late 90s, Information and Communication Technology (ICT) began to be recognized in pre-university education institutions in Albania, although Albanian schools were not equipped with computers and virtual laboratories or smartlabs. Over the years, it became possible to install local computer networks and connect them to the Internet. Technology in our education system began to be widely used in December 2006. The next challenge was to equip schools with laboratories and the professional development of principals and teachers who, in most pre-university education institutions, encountered difficulties in using and managing them. During 2009, most public schools were equipped with computer laboratories.

During this same year, ICT teachers were also trained (this includes computers, tablets, interactive whiteboards, etc.), and the updating of ICT curricula and programs began. The process of digitizing the learning process began in 2014 and continues today, with 316 SmartLabs distributed to pre-university education institutions by May 2025 (100 SmartLabs in the first phase, 216 new SmartLabs in the second phase). For the third phase, the Ministry of Education plans to install 654 more SmartLabs, with the aim of further expanding the network to around 1,000 schools in Albania. According to the Education Strategy 2021-2026, the "21st Century Schools" program, funded by the British Council, is being implemented in 1,194 schools. This program, among other things, aims to equip students aged 10-15 with digital and coding skills using the Micro:bit to program various subjects and solve everyday problems.

The "Artificial Intelligence for Youth" project was piloted in the 2022–2023 school year and initially extended to 30 high schools in 11 cities in Albania. In terms of equipment, 22 smart labs have been created, 140 ICT teachers have been trained and 2,000 students have been involved so far. In September of this year, the "Guide for the Ethical Use of Artificial Intelligence through Smartlabs in All Subjects" was drafted and published by the Agency for Quality Assurance in Pre-University Education (ASCAP). This guide has been drafted in accordance with the most international developments in the field of AI, and is based on the European Act on Artificial Intelligence (EU AI Act), the recommendations of UNESCO and OECD, and is based on the best practices of international educational institutions. Likewise, the integration of Technology in pre-university education is justified in the Joint Instruction No. 15, dated 18.08.2026 "For the 2026-2027 school year in the pre-university education system." Article 17, point 4, states that "In basic education institutions that are equipped with Smart Laboratories, the heads of IAPs ensure their use in order to improve the learning process for all students: a) for the development of the lesson of the subject "Information and Communication Technology (ICT)" for all grades from the first to the ninth according to a well-organized calendar by the directorate." In this same instruction, in Article 25, point 2/a, point 2/c, point 4/a,b,c, projects in which pre-university education institutions can participate are presented, such as the "Element IT" project, "Artificial Intelligence for Youth", the "Eduten" digital platform, the "Akelius" digital platform, the implementation of the "Giga" initiative.

4. ICT-based teaching

Information and Communication Technology (ICT) is defined in the Oxford Advanced Learner's Dictionary as the study or use of computers, the Internet, video and other technologies as a school subject or general field.

During the observations conducted in the period April-May 2025-2026, which were 13 thematic observations, one of the observation themes was the integration of ICT in the learning process. In the draw, the classes and subjects that I would observe were selected in advance. During the thematic observations, I had the opportunity to see two types of teaching methods, one where technology is naturally integrated and on the other hand the method according to the traditional teaching line. Below are described the general characteristics according to the subjects that I observed:

In the Biology subject, grade VII, the topic "Human Body Organs." The students had prepared a PowerPoint diagram with pictures of body organs on one side and their functions on the other. The teacher had also prepared a presentation in the Biodigital human program, which studies the human body and organs in 3D.

In the English language subject, grade XII, "A tourist guide in Albania." The students had prepared presentations, leaflets and brochures in Canva and PowerPoint for the three regions, Northern Albania, Central Albania and Southern Albania, highlighting the traditions,

geography, folk costumes and gastronomy of each region. The students on the Spread the Sign platform had prepared examples of words in English sign language and watched a documentary on YouTube about Albanian folk costumes and the xhubleta, which in 2022 became part of the UNESCO Intangible Cultural Heritage List.

In the Mathematics subject, grade XII, the topic "Mathematics in everyday life" was developed, where students brought examples of the widespread use of mathematics in everyday life, such as Measuring a size means comparing this size with another size of the same type, which we take as a unit of measurement or when proportion is widely used in everyday life, when the doctor writes the doses of medications in a prescription, when we mix the ingredients of a prescription, when we find the cost per unit, when we convert units, etc. The teacher illustrated these examples in the GeoGebra program.

In the Albanian Language subject, grade VI , during the lesson on the topic "Silent Story: The Power of Communication Without Words," students expressed these ideas through a flipbook program. The project resulted in two booklets: "Red Balloon" and "Friendship." Initially, the teacher showed students two animated videos without subtitles, also entitled "Red Balloon" and "Friendship." In the second phase, students added typed subtitles. Together with the teacher, they then completed the final product in PowerPoint: two flipbook booklets ready for printing.

In the Life Skills subject, grade VI "Summer Day", the lesson began with a Brainstorming session where the students showed their knowledge about the tradition of celebrating a pagan rite such as Summer Day while the teacher had written on the blackboard the rites of the holiday, its characteristics and had prepared baskets where the summers, balokums and branches with plum blossoms were placed. The students were focused on the teacher's tools and illustrations and were unable to succinctly express the characteristics of the tradition that is inherited from generation to generation.

In the Cultural Heritage subject, grade X, the topic "Cultural Heritage of Crafts Albanian." The teacher and students had started working on some embroidery with a loom, crochet and spear in the first hours of the project and completed them during the last hour of the project, which was also the presentation phase of the project. At the end of the hour, the students demonstrated their works individually and explained the work they had done. For this topic, videos from YouTube could be used to recall the knowledge gained about the characteristics of folk costumes, embroidery, carpets with traditional motifs, etc., or videos of various craft processes.

In the Computer Network subject, grade XII, in the teaching topic: "Static and dynamic routing", the teacher had prepared the drawing PC → Router → Server, meanwhile, for this teaching topic, the Cisco Packet Tracer program can help us where routing is configured and the path of packet creation is visually seen.

5. Instrument results

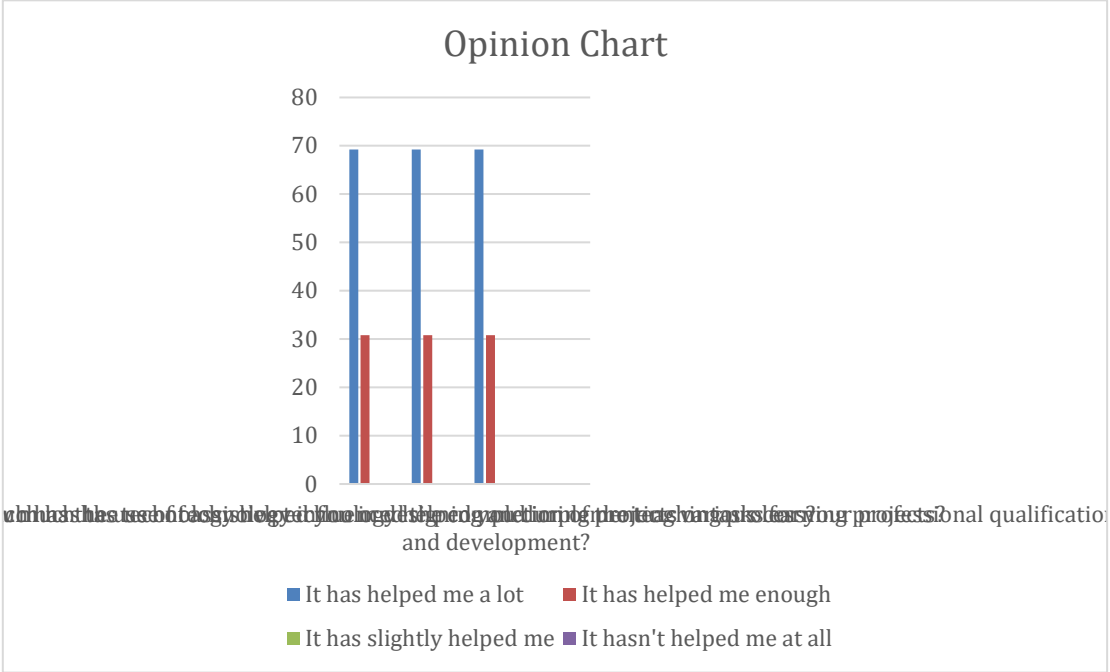
To complete the instrument, 13 teachers from three subject teams were selected, namely the Social Sciences Subject Team, the Natural Sciences Subject Team and the Special Subjects Subject Team.

Question no. 1: How much has the use of assistive technology helped you during the teaching process? Nine teachers responded "it helped me a lot", four responded "it helped me enough".

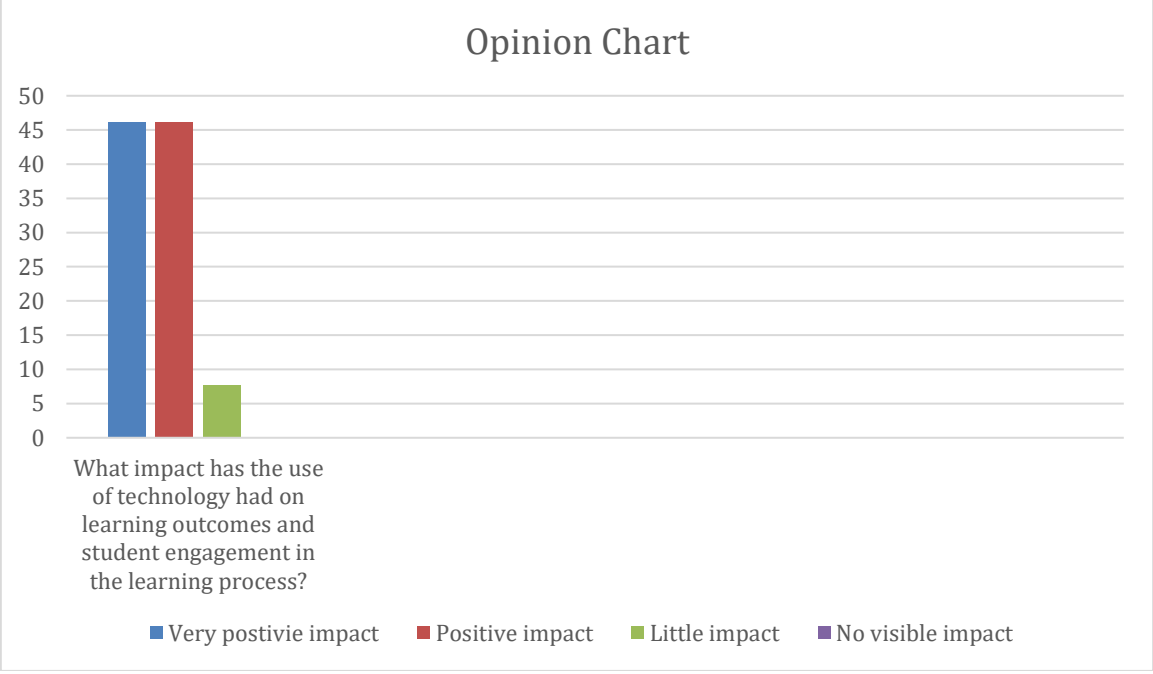
Question no. 2: How much has technology helped you in designing and implementing various teaching projects?

Question no. 3: How much has the use of technology influenced the implementation of projects or tasks for your professional qualification and development?

For all three questions, 69.2% of them answered It helped me a lot, 30.8% of them answered It helped me Enough, none of them answered “It helped me a little” or “It did not help me at all”.



Question 4. What impact has the use of technology had on learning outcomes and student engagement in the learning process?



Six teachers (46.2% of participants) responded, “It had a very positive impact,” and another six teachers (46.2%) responded, “It had a positive impact.” One teacher (7.7%) responded with “Little impact”.

6. Conclusions

The use of technology contributes much to learning process. Technology such as the use of tablet computers makes lessons fun and exciting for students. Moreover, graphics from different sources also enable teachers to organize information much faster than before and pupils get it quickly too.

Additionally, technology promotes learning through creativity. The next advantage of using technology in education is the fact that students with disabilities are taken into consideration since it becomes easier for them through technology. Teachers who believe in the traditional way of teaching are those who exaggerate its effects on learning.

"What is written on the blackboard is learned". This common view of traditional teaching where the teacher remains at the center of the curriculum seems filled with numerous and complex knowledge for students. In these classes, the teacher seems to have a mission to finish explaining the lesson in a quick and efficient way, the teacher speaks, shows and the student follows. A teacher who teaches the subject of Geography thinks, "I finished explaining the population of Albania".

But do students learn only by following the teacher's explanation? And have they acquired all the learning outcomes foreseen for the topic?

What is the role of the teacher's explanation compared to what the student learns independently or compared to what the student learns using technology as an auxiliary and illustrative tool for the Z and Alpha generations.

If we were to explain the learning process according to the learning theories of the 19th century. Theories, such as behaviorism, cognitivism, constructivism, connectivism, etc., seem like distant memories for teachers but we can consider them as tools. to achieve learning objectives, always intertwining them with digital competencies and the integration of technology in teaching. The greatest contribution of Behaviorism is to underline the importance of reinforcing and maintaining knowledge.

And for this, digital competencies and technology come to our aid.

Unlike behaviorism, cognitivism focuses on the conception of the mind as an information processor, similar to a computer, that organizes information in different forms. Just like the student who is not an "empty container", but an active processor of knowledge.

Constructivist theory suggests that the learner constructs knowledge on his own, and the teacher serves as a guide or facilitator in this process. Knowledge cannot be transferred from teacher to learner; however, teachers can provide conditions under which the learner will construct it on his own.

Learning is an individual process and students build, systematize and classify their own individual system of knowledge. And technology is very important to use as a facilitating factor in this complex process. From the student's perspective, it is not only important to construct meaning, but also to analyze the context. A teacher teaching a class of 20 students should be aware that from his explanation about 20 versions of the topic explained are produced and interpreted, because understanding is a specific individual process.

Therefore, the revision of knowledge is a more complex process than simply replacing or supplementing "knowledge" with each other, which are provided by the teacher during the explanation without the help and integration of technology.

Learning is a continuous process where the student is at the centre of everything. Students construct, analyze, and interpret knowledge through interactions among themselves, and not through interactions with the teacher. They should also think critically about what they learn and use it in their daily lives.

Integrating technology supports this process by illustrating and bringing together all the processes mentioned above.

The use of technology does not only mark advantages, it also goes through several challenges such as the lack of technological equipment, problems with the internet connection of each school, as well as the shortcomings of the professional development of teachers to be updated with the latest technological developments and, consequently, to integrate it efficiently.
Technology does not aim to and cannot replace the teacher, but supports him in his activities by creating a more efficient, more inclusive and more creative learning environment.
We conclude that Technology must be integrated in a planned, intentional and appropriate manner for the needs of each student.

7. Recommendations

It is recommended that teachers use technology for the benefit of the learning process by carefully planning which topic and which stage it should be used because its integration should not be random. The integration of different platforms and programs is done in order to make knowledge more understandable and attractive to students.
Different appropriate communication platforms should be considered as auxiliary tools in adapting learning materials according to the specific needs of students. Teachers should orient and guide students in the responsible and safe use of technology. Also, the students need to be taught how to recognize real information among the abundance of false information available on the internet. The priority of the school today is to provide students with an appropriate learning environment, where everyone is provided with appropriate education according to their needs. In such an environment, the students may take the help of technology as an additional tool for achieving better learning results. The teachers need to welcome any new approaches in teaching and work in cooperation by exchanging good experience of technology use.
The effective use of technology depends on the learning goals as it is used. The OECD report, PIZA 2022, states that fifteen-year-old students who use various digital platforms have better results and are better connected to the school community. But the same study highlights that excessive use of technology had an impact on the decline in performance.
The message of this report is related to the role of the teacher: according to the OECD, the use of technology guided by the teacher is associated with better results, while use left solely to the initiative of students tends to produce the opposite effect. In other words, it is not the device that makes the difference, but the teaching approach with which it is presented. *(OECD, 2023)*
This explains why the professional development of teachers in the use of digital tools and platforms and their approach to updating technological developments is such an important factor today.
In other words, it is not the technology that makes the difference but our approach and the way we integrate technology into lesson planning.
Today's students are native to the technological world, having grown up with smartphones and tablets in their hands. They expect that school will be an extension of the real world that they are growing up in. Educating these students about the future involves embracing technology and incorporating it into our teaching process.

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