



Programming as a need for integration in the curriculum of the subject of technology with ICT in the lower secondary schools of Kosovo

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ABSTRACT

Kosovo is a small country but with bright education integrates the newest European curricula, especially in the curricular field of Life and work in the subject of technology with ICT. In this scientific paper, we will discuss the need to integrate programming in the curriculum of the subject of Technology with ICT in the lower secondary schools of Kosovo. Programming is a rapidly growing field and is increasingly used in the modern world of technology. If our students will have good knowledge of programming, they will have a great advantage in their future careers. We can conclude that a long-term and clear strategy should be developed for the integration of programming in the curriculum of the subject of Technology with ICT in the lower secondary schools of Kosovo, which will help prepare students for the labor market in the field of technology and programming. Our recommendations, we suggest improving the curriculum of the ICT subject, including a project-oriented approach to help students develop practical skills in the field of programming. We also suggest more complex training for teachers to ensure they have the skills and knowledge to teach this subject in a way that is appropriate for students.

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1. INTRODUCTION

In today's digitized world, knowledge and skills in the field of technology are necessary to be integrated into everyday practices. School should be a place that should develop students' skills to face the challenges of modern life. This requires that the curriculum be changed and adapted to the needs of the time. In this scientific paper, we will examine the need to integrate programming in the curriculum of the subject of Technology with ICT in the lower secondary schools of Kosovo.

Programming is one of the most important fields of technology and is widely used throughout the world of information and communication technology (Aduwa-Ogiegbaen & Iyamu, 2005) (Hossain, 2023). Programming is the process of creating various applications and software, using various programming languages such as Java, Python, C++, etc. Programming provides the ability to develop various applications and solve problems in an innovative way (Sebesta, 2012).

Lower secondary schools are the important part of the education system of Kosovo. These schools must create opportunities for all students to develop the skills needed to make a career and be part of a changing world (Kaplan, 2023). In this aspect, the integration of programming in the curriculum of the ICT Technology subject would help Kosovo's lower secondary schools to provide the necessary programming skills in all areas of life (Ottestad & Gudmundsdottir, 2018). The integration of programming in the curriculum of the subject of ICT would affect the improvement of communication skills, problem solving and the use of information and communication technology (Haleem et al., 2022).

In lower high school, students are at an age where they are open to all the opportunities available to them. Integrating programming into their curriculum can influence their future career choice (H. Zhang et al., 2022). Students may be interested in programming and may wish to pursue a career in the technology field. By starting with programming in school, they will have a solid foundation to follow such a journey in their career (Lepik & Urmanavičienė, 2022). While many schools are increasingly using technology, programming has yet to be fully integrated into their curriculum. This is one of the reasons why Kosovo has a large deficit of qualified programmers, while the demand for them is high. In particular, programming will help students develop various skills, such as: solving problems, developing creativity, inventing new technologies and many others. This process will also help develop their project-based learning skills, which is an important teaching method in technology (Sultana, 2007).

The main problem that is intended to be solved may come as a result of several factors, including: (Nazikhovna, 2022) The development of computer technology and programming has brought new challenges regarding the integration of these areas in the school curriculum; Increasing demand for programming skills in the labor market or changes in educational policies may bring the need to further consider the integration of programming into the school curriculum (Alam, 2022); It is intended to present accurate, verifiable and useful results for the scientific community and, respectively, affiliations in the field of study (Ghavifekr & Rosdy, 2015).

In this research, to try to solve the identified problems, an in-depth analysis of the literature was made and the challenges and obstacles that could be encountered in the integration of programming in the curriculum of the ICT Technology subject in lower secondary schools were considered. of Kosovo. To address these challenges, some recommendations and practical solutions were proposed, taking into account the experiences of other countries. This effort was made in order to help educational institutions and Technology teachers in Kosovo to effectively integrate programming into their curriculum.

Previous studies have examined the topic of the integration of programming in the curriculum of the subject of Technology with ICT in lower secondary schools in different countries. For example, Linda Darling-Hammond, Megan E. Hopkins and Arthur Edmonds (2010) have analyzed ten ways to improve education through innovative ideas. Martin Dougiamas and Peter Taylor (2003) have looked for ways to create an open source course management system using learning communities (Dougiamas & Taylor, 2003). European Schoolnet (2015) has researched programming in primary schools. These studies have provided different evaluations and recommendations for the integration of programming in the school curriculum, as well as presented the experiences of other countries (Sáez-López et al., 2016).

The new research aims to focus on the specific situation of lower secondary schools in Kosovo and identify the needs and challenges of integrating programming into the curriculum of the ICT Technology subject in these schools. It will analyze the necessary skills of students to prepare them for the job market in the field of programming and technology. Also, the research will assess the way technology is currently used in teaching in these schools and will identify needs for improvement in this regard. The research also aims to identify the resources and technological tools needed to assist students in teaching and developing their skills in the field of programming. An important aspect of the research is the evaluation of the experiences of other countries in the integration of programming

in the curriculum of the subject of Technology with ICT and the possibility of their transfer to the situation of lower secondary schools in Kosovo (Sultana, 2007).

Expectations for the results and benefits of the research are high and their impact is expected to be positive in the field of education and technology in the lower secondary schools of Kosovo. Some of the main expectations are:

Identification of students' needs: The research aims to identify the specific needs and challenges of students regarding the integration of programming in the curriculum of the subject of Technology with ICT. The results of the research will provide valuable information for the development of programs and teaching materials that address these needs.

Improving teaching: By analyzing how technology is currently used in teaching in Kosovo's lower secondary schools, the research aims to identify difficulties and needs for improvement in this aspect. The results of the research will provide concrete recommendations and solutions to improve teaching related to programming and technology.

Developing student skills: The research aims to identify the resources and technological tools needed to assist students in teaching and developing their skills in the field of programming. The results of the research will provide practical guidelines for using programming languages such as Scratch, Java, C++, HTML, CSS, JavaScript in teaching and training students.

Transfer of experiences from other countries: An important aspect of the research is the evaluation of the experiences of other countries in the integration of programming in the curriculum of the subject of Technology with ICT (Jhurree, 2005). By transferring these experiences to the situation of Kosovo's lower high schools, it is expected that the research will bring innovations and new practices that will help improve education and teaching in the field of programming.

Kosovo, as a young country, is developing and the job market is growing, but, however, it may need more technology and programming professionals in the future. In order to create a good foundation for students, and to make a lasting contribution to the development of the country, it is necessary that the programming be integrated into the curriculum of the subject of ICT Technology in the lower secondary schools of Kosovo.

One of the main reasons why programming should be integrated into the curriculum of the ICT Technology course is the increased demand for programmers in the labor market. In all areas of the industry, we have a great need for programmers who can build and develop various applications and programs. These labor market demands will not change over time, so it is important that schools follow this trend and provide more technological knowledge to their students.

The research problem is the integration of programming in the curriculum of the subject of Technology with ICT in the lower secondary schools in Kosovo. This requirement has become necessary to prepare students for a world where technology is increasingly present and important in everyday life and in the world of work. However, there is currently no full integration of programming in the curriculum of the subject of Technology with ICT in lower secondary schools in Kosovo. This research aims to analyze the experiences of other countries in the integration of programming in the curriculum of the subject of Technology with ICT and to propose possible solutions for their transfer to the specific situation of Kosovo.

The purpose of this scientific paper is to argue the need for the integration of programming in the curriculum of the subject of Technology with ICT in the lower secondary schools of Kosovo. By discussing the benefits of this practice, as well as focusing on the importance of programming in everyday life and in the business world, this paper aims to stimulate discussion and action towards improving the teaching of technology in lower secondary schools. Kosovo. Through the analysis of the current situation in Kosovo, the benefits of programming skills in the ICT curriculum will be examined and the argumentation will be presented as to why it is important for schools to integrate programming into teaching. Also, the other goal is to sensitize public opinion and politics about the need to invest in programming skills in lower secondary schools in Kosovo, helping to prepare students for the future in the world of technology.

This analysis will help teachers and school leaders to make a further assessment of students' needs and make better use of technology resources in teaching. In this way, schools will be able to provide a more appropriate education for students and prepare Kosovo's youth for a global job market in the field of technology and programming.

By examining these objectives, this study will be able to provide a complete and general assessment for the integration of programming in the curriculum of the subject of Technology with ICT in the lower secondary schools of Kosovo and will be able to help improve education and developing students' programming skills. (a). The need for the integration of programming in the curriculum of the subject of Technology with ICT in the lower secondary schools of Kosovo. (b). Identifying the necessary skills of students to prepare for the labor market in the field of programming and technology. (c). Assessment of how technology is currently used in teaching in Kosovo's lower secondary schools and identification of needs for improvement. (d). Identification of resources and technological tools necessary to help students in teaching and developing their skills in the field of programming. (e). Evaluation of the experiences of other countries in the integration of programming in the curriculum of the subject of Technology with ICT in lower secondary schools and the possibility of their transfer to the situation of Kosovo. (f). Identification of possible challenges and obstacles that can be encountered in the process of integrating programming in the curriculum of the subject of Technology with ICT in the lower secondary schools of Kosovo and proposing possible solutions for them.

2. METHOD

Some theoretical studies related to the problems examined in our research on the integration of programming in the curriculum of the subject of Technology with ICT in lower secondary schools (Jimoyiannis, 2010).

This chapter will include an in-depth analysis of the literature related to the integration of programming in the curriculum of the subject of ICT Technology in lower secondary schools. Information about good practices and potential challenges of this process will be included.

To process the data from the literature review in this research, we followed a systematic process that includes the following steps (Torres-Carrión et al., 2018) (Papaioannou et al., 2016): We conducted an extensive and detailed search in scientific databases, virtual libraries, scientific journals and websites to identify appropriate resources for the research topic. The criteria for the selection of sources have been related to their compliance with the research objectives and their value for the context of the study. After identifying suitable sources, we read and analyzed each source to summarize information and discover findings relevant to the research topic. We have highlighted concepts, theories, arguments and other research results related to the integration of programming in the curriculum of the subject of Technology with ICT in lower secondary schools. After reading and analyzing the sources, we organized the data systematically and thematically to create a clear understanding of the various findings and ideas emerging from the literature reviewed. We have identified the key themes and sub-themes that are summarized in the research and have established a logical structure for their presentation in the research report. After organizing the data, we interpreted and synthesized the findings from the literature in order to determine the main trends, relationships, concordances and differences between the different studies. We have identified the main factors that influence the integration of programming in the curriculum of the subject of Technology with ICT and we have formed a clear overview of the current status and the challenges that exist.

The placement of computers can be done in different ways, by placing them in computer cabinets to classrooms with one and many computers (Mexhuani, 2014). In various countries of the world, a great effort has been made to integrate programming into the curricula of the ICT Technology subject in lower secondary schools. Here are some references to the experiences of other countries in this field: In the USA, elementary and secondary schools are integrating programming into the curriculum of the subject of Technology with ICT in a comprehensive way. This has been done through

initiatives like "Code.org" and "Scratch" that have created tools and resources needed to help teach and develop skills in the field of programming ([Code.org, 2021](#)). Germany has made a big effort to build a common curriculum of Technology with ICT for all secondary schools. This curriculum includes teaching in areas such as programming, software engineering, and information and communication technology. Singapore has integrated programming into the ICT curriculum since 2014. This has been done through an initiative called "Code for Fun" that provides the resources and tools needed to help teach and develop skills in the field of programming. In India, programming has been integrated into the ICT curriculum extensively since 2017. This has been done through the program "Atal Tinkering Labs" that provides the resources and tools needed to help teach and develop skills in the field of programming ([INDIA, 2023](#)).

Filamentality is an interactive Web site that we created because learning HTML, designing a Web-based activity, and posting pages on the Net are three pretty big hurdles for people with students to see, papers to grade, lessons to write, and cookies to bake (the true glue that keeps a class happy) ([Haddad & Rennie, 2005](#)). The objectives pursued along with the integration of ICT at the primary level can cover the category of major objectives which is the development of programming skills ([Yildirim & Göktas, 2007](#)). However, the findings from the Ziphorah (2014) study highlighted the availability of infrastructure as well as teachers not having knowledge and skills of computer technology ([Ziphorah, 2014](#)). Findings from Tondeur et al. (2008) suggest that successful ICT integration is clearly related to actions taken at the school level, such as the development of an ICT plan, ICT support and ICT training. The results also suggest that principals should develop a more collaborative approach when setting this policy ([Tondeur et al., 2008](#)). The truth is that the general perception of teachers is that the use of computers in the classroom continues to be for students, synonymous with play, fun and entertainment; they consider it a prize or reward ([Malagón & Pérez, 2017](#)). The adoption of modern approaches to the integration of ICT in teaching and learning is necessary. The study revealed the use of other software and applications. The world is now moving towards artificial intelligence, while they are getting rid of old technologies in education ([Ngao et al., 2022](#)). In conclusion, teacher training programs should have a systematic approach in their curriculum to help pre-service teachers use ICT before teaching their students to give them first-hand experience in classes ([Ahn, 2007](#)). Findings show that learning to program before starting ICT studies gives an advantage in studies and working during studies is associated with lower extrinsic motivation. This suggests improving opportunities for students to gain programming experience (studying or working) prior to university studies in order to support their future studies in the ICT field ([Kori et al., 2016](#)). Recent years have seen a new generation of programming languages and tools that enable end users to develop application software for smart mobile devices ([Dekhane & Xu, 2012](#)).

On the other hand, from the study of Humble (2021) it is emphasized that the findings can be supported by teachers and other interested parties in the decision of which programming tools should be integrated in the classroom practice and how they will be used ([Humble, 2021](#)). In terms of programming tools related to school subjects and student grades, the most common relationships are with math and technology and second and third grade. The relationship with the school subjects, this is in line with the integration in the Swedish K-12 education where the curriculum has specific mention of programming in the subjects of mathematics and technology ([Heintz et al., 2017](#)). Integration based on logic programming appears to be promising in terms of the development and practical application of theory and student learning outcomes ([Y. Zhang et al., 2019](#)).

3. RESULTS AND DISCUSSION

Result.

The research method for this study includes a combination of literature review. This method is suitable to analyze and evaluate the needs, challenges and opportunities of programming integration in the curriculum of the subject of ICT Technology in the lower secondary schools of Kosovo.

At the beginning, a broad review of the literature and sources used to identify the results of previous research related to the topic of study is done. This includes the analysis of scientific articles, books, reports of international organizations and other relevant materials that deal with the integration of programming in the school curriculum.

For lower high school students, it is appropriate to review and discuss some of the programming languages that are important and used during the process of programming integrity in the curriculum of the ICT Technology subject in lower high schools in Kosovo. Some of the programming languages that will be covered in this research are:

Scratch: Scratch is a visual programming language developed by MIT to help elementary school students understand the essence of programming. Scratch is a simple and understandable programming language for lower high school students, so it can be used to make changes in the curriculum of the ICT Technology subject in these schools. Scratch is the world's largest coding community for kids and a coding language with a simple visual interface that allows young people to create digital stories, games and animations. Scratch is designed, developed and moderated by Scratch Foundation, a non-profit organization. Scratch promotes computational thinking and problem-solving skills; creative teaching and learning; self-expression and collaboration; and equity in computing. Scratch is always free and available in more than 70 languages. Scratch is designed specifically for ages 8 to 16, but is used by people of all ages. Millions of people are creating Scratch projects in a variety of settings, including homes, schools, museums, libraries, and community centers. The ability to code computer programs is an important part of literacy in today's society. When people learn to code in Scratch, they learn important strategies for solving problems, designing projects, and communicating ideas. Students are learning with Scratch at all levels (from elementary school to college) and across all disciplines (such as math, computer science, language arts, social studies). Educator resources are available on the Scratch site For Educators ([Scratch, 2022](#)).

Java: Java is an object-oriented programming language widely used in the development of desktop applications, web applications, and computer games. In the current scenario, all electrical devices, applications and software are made with programming languages like Java. It is one of the most popular programming languages among coders. It is used by various technology companies because of its amazing features that facilitate easy, fast and convenient programming or coding without compromising the accuracy of the codes. Java is a multi-programming language used to create software programs and hardware programs. Today, every software, application and website we see is built with Java. It helps coders create apps and games with a user-friendly interface for personalized interactions. Various libraries allow simplifying Java while coding. Knowing the basics of Java guides the way to various coding and programming opportunities. Week for Beginners can help kids understand basic coding concepts. Since children are mainly attracted to video games that are created using Java, it provides opportunities to start writing codes. Learning Java programming code can help develop embedded skills in children at a young age. It improves their imagination and creativity as well as problem solving skills. Further, writing and running their own codes can enable them to learn new concepts through experimentation. Once they have a good grasp of Java, kids will be able to write more complex code and languages in the future ([Vedantu, 2023](#)).

Python: Python is an interpreted programming language used for developing desktop applications, web applications, network applications, and artificial intelligence. There are dozens of programming languages, and many of them are good for a wide variety of projects. Python is unique in that it is easy to understand, even for children with no programming experience. We recommend Python for children because some languages use a confusing combination of symbols and abbreviations. This is not the case with Python, which powers the second largest search engine in the world: YouTube. Scientists use Python to work with large data sets. Software engineers build neural networks and other forms of artificial intelligence with this versatile language. There are many different ways for kids to learn programming in Python or any other language, such as coding websites, apps, and games. With such an array of tools available, it can be difficult to choose which ones are

most effective. It's easy to feel overwhelmed, but learning the basics of Python isn't as difficult as it might seem. The key is to make it easy for kids to learn Python by working with small chunks of information at a time. If the information is organized in a highly visual format, that's even better. Programming with Python is like any other skill, it requires frequent practice. Kids who regularly use their Python skills to build projects and solve problems will retain their knowledge. Those who do are unlikely to forget most of what they have learned in a very short time. Practice is key, so make sure your child has regular opportunities to use Python ([Choi, 2022](#)).

C++: It is a programming language that can be used to develop desktop applications, mobile applications, games, operating systems, etc. C++ is a complex but important language for developing various applications. C++ is one of the most popular computer programming languages in the world. It is used to develop many things, from fun video games to major operating systems such as Microsoft Windows and Apple's iOS. It's never too early to learn a coding language! The C++ programming language opens up a whole new world for children. From designing web pages to websites to game development, an 8-year-old or older can get a head start. Learning today's tools can prepare a child for future careers and hobbies! Along with creative coding, C++ develops problem-solving skills and a love of computer science. It also helps children learn good programming habits. This encourages them to start building their own games, websites and more. The C++ programming language is very versatile, making it great for a wide range of purposes. The language is welcoming, practical and allows children to easily share concepts with other children. It also gives programmers more freedom to do what they want. C++ offers high performance and precise control. Applications range from video games to software to artificial intelligence. Keep in mind that no language is better than another. Each shines in its own way. The key is to learn them and find the right fit. Kids' coding basics can lead to more advanced learning, opening doors to game programming, web design, Android development, and much more ([Junilearning, 2021](#)).

C#: C# is an object-oriented programming language widely used in the development of Windows applications, web applications, and computer games. At first glance, C# has several qualities that make it an ideal learning language: A compact syntax that resembles other curl languages. Forget the supposed readability of Python. Once you get used to the conventions of C# code, you can understand half a dozen important languages. A beautiful blend of mature and modern. Yes, there are some inheritance handlers (don't get me started on the ugliness of the switch statement, and you can see the layers where they grafted onto functional programming). But compared to anachronisms in JavaScript or Java, C# is a clear winner. C# is often described as a multiparadigm language, and it deserves the title. C# is a natural fit for classic object-oriented programming, but it will also get you out of the way if you just want to focus on basic procedural thinking - and it provides a path to learning functional concepts. Open source is more of a demand than an asset. But the days when Microsoft's language standards threatened to choke the world with developer lock-ins and proprietary systems are gone. Coding isn't much fun if you can't do a real thing, and most of the kinds of applications you can build in C# require thick frameworks with lots of hidden magic and auto-generated code. This is not a great place for a beginner to start. In a perfect world, the first C# program a new learner would write would be something that interacts with a web page. But C# can't do that - at least not without plugging into a heavyweight framework like ASP.NET or Blazor. C# is a solid language to learn, but it's hampered by a simple problem: the C# and .NET environment don't have the easy and engaging learning paths you can find in Python or JavaScript. Today, you'll get the best results by spending your teaching time at the keyboard. You can make this approach work, but it's not ideal ([MacDonald, 2021](#)).

HTML and CSS: HTML and CSS are two languages that are used to create web pages. HTML is the language used to create the structure of web pages while CSS is used to style and beautify web pages. HTML (Hypertext Markup Language) is a programming language that defines the structure and elements of a website. CSS (Cascading Style Sheets) is a programming language that formats HTML elements and adds styles to a web page. HTML and CSS are two of the main coding languages used to develop websites. Kids learn HTML and CSS in our live, interactive coding classes for ages 8-18. HTML

and CSS classes for kids are a great place to start learning how to code. Basic HTML, CSS, and JavaScript skills are used in many different careers. Any job involving a website can benefit from knowing HTML and CSS. A tutor-led course can help build your child's coding skills quickly and give them the confidence to learn more advanced languages. Elementary school kids have fun creating and developing web pages in HTML and CSS. Learning to code also helps them build typing skills and provides an introduction to computational thinking. Kids move from block-based programming to text-based programming in this class and learn how to design and build their own websites. After learning the structure of HTML web pages, such as the div tag, image tag, and header tag, students then apply CSS styling, such as colors, backgrounds, and animations, to customize their web pages. Students build more complex web pages with HTML and CSS in this class and add interactivity in JavaScript. They will code websites that are functional and beautiful. Students can customize themes, graphics, and designs in their online projects (CodeWizardsHQ, 2019).

JavaScript: JavaScript is a programming language used for developing web applications and network applications, and is known for its ability to dynamically change web pages and create appropriate visual effects. JavaScript is a powerful programming language for creating interactive web pages and web applications. JavaScript is a programming language used on the client side of web applications. It allows developers to write code that performs actions and interacts with the user without reloading the page. JavaScript can be used for basic tasks like changing the color of an element, but it can also be combined with other languages, such as HTML and CSS, to create more complex effects and animations. JavaScript can add text dynamically, create interactive content by manipulating elements on the screen, and update information in real time. The syntax includes curly braces and semicolons, which must be present after each line for the program to run correctly. Simply put, JavaScript is mostly used to improve the interactivity of websites and applications. There are many reasons kids should learn to write JavaScript, but most have nothing to do with your child's eventual job choice. While studying JavaScript can certainly spark an interest that can lead to a career, there are many reasons your child should learn JavaScript, but highlighted below are some of the things they benefit from: Problem solving, logical reasoning, persistence, web development, etc. Children as young as eight can start learning JavaScript. Coding is like learning a second language; Studies have shown that young children are more adept at learning new languages. Because this is a text-based programming language, typing skills are essential. If your child has good typing skills, JavaScript is a great language to learn. If children have difficulty typing, block-based coding may be a better option to start their coding career. When teaching coding to elementary school students, it's essential to focus on the basics of JavaScript, such as variables, loops, and functions. Syntax is very important for this age range because they need to understand the rules for typing JavaScript correctly. Children ages 8-10 can use the basics of JavaScript to build animated games or interactive websites. As they mature in high school, they can move on to more advanced topics, such as creating GUIs (graphical user interfaces) using JavaFX. Basic HTML skills will also come in handy, so learning them both HTML and JavaScript together will be great. A great way to do this would be by having them build a basic website from scratch. So, the web is a dynamic and ever-changing place. Users interact with each other and with sites differently than they did a few years ago, and technology continues to advance. There is always something new to learn. Children need opportunities that keep their skills relevant for the future. This is where JavaScript comes in! (Tev, 2022).

Discussion.

Technology and programming are two fields which are very important in the modern world. By integrating programming into the curriculum of the ICT Technology subject in Kosovo's lower high schools, students will have the opportunity to develop their technological skills and learn how to build various applications and programs. Programming is a field that is in high demand in the labor market, and its integration into the curriculum of the ICT Technology subject in Kosovo's lower secondary schools will prepare students to be more competitive in the labor market and to have a successful career in technology. This is a field which is very much related to innovation and creativity. By

integrating programming into the curriculum of the ICT Technology subject in Kosovo's lower high schools, students will have the opportunity to develop many new ideas and build different applications and programs, thus making it possible to contribute to the development of society and the economy of Kosovo. Technology is developing rapidly, and by integrating programming into the curriculum of the ICT Technology subject in Kosovo's lower high schools, students will have the opportunity to prepare for the future development of technology and be ready to change the world. In this sense, the skills most required by technology companies can prepare students of lower secondary schools in Kosovo to meet these demands. Also, the most effective methods of teaching these skills and the best practices followed by other lower secondary schools in the world. This analysis helps in developing a genuine curriculum that can provide the necessary skills and knowledge to students in the field of programming and technology. Therefore, an assessment of this nature helps to identify weak aspects in teaching and to develop strategies for improving teaching in lower secondary schools in Kosovo.

Also, programming and these resources can be used in teaching to improve students' performance and skills in technology subjects. In Kosovo, we may have the opportunity to transfer and adapt some of these models of European countries and programs to the situation of lower secondary schools. By consulting and collaborating with subject matter experts and teachers, we can build an effective program to help our students develop their programming skills and prepare them for the tech job market.

These resources address a wide range of issues related to the integration of programming into the ICT curriculum in lower secondary schools. In particular, they examine the ways in which different countries have used programming in teaching, the various opportunities and challenges that technology offers in this area, and the strategies they have followed to integrate programming into their curriculum. These resources can serve as a model for Kosovo and can help to develop an appropriate approach for the integration of programming in the curriculum of the subject of Technology with ICT in lower secondary schools in Kosovo.

Integrating programming into the curriculum of the ICT Technology subject in Kosovo's lower secondary schools is a complex challenge and needs a detailed plan and long-term strategies to make it possible. Some possible challenges and obstacles that may be encountered in this process are: Lack of training and preparation of teachers in the field of programming and technology, causing them to have little or no ability to learn and teach these subjects; The lack of resources and technological tools in lower secondary schools, which can hinder the learning and development of students' skills in the field of programming; Difficulty in using programming languages and technological tools for students and teachers who do not have experience in this field; The lack of seriousness on the part of lower secondary schools and the education system in general in the integration of programming in the curriculum of the subject of Technology with ICT;

Lack of interaction and cooperation between schools, educational institutions and businesses to provide the training and resources needed to integrate programming into the ICT curriculum. To address these challenges and obstacles, some possible solutions can be proposed, such as: Developing teacher preparation and training programs in the field of programming and technology, using the expertise of educational institutions and businesses; Investing in resources and technological tools for lower secondary schools and using those resources in teaching; Providing assistance and training to students and teachers in the use of programming languages and technological tools; Encouragement and support from the educational system and businesses for the integration of programming in the curriculum of the subject of Technology with ICT, with the use of successful models from other countries; Interaction and cooperation between schools.

In this study, it was intended to look at the need for the integration of programming in the curriculum of the subject of Technology with ICT in the lower secondary schools of Kosovo. Through the methodology used for this study, the set objectives and goals were achieved. In this chapter, the main findings of this research and their implications for education practice and education policies in Kosovo will be discussed. The main findings of this study show that there is a need for the integration

of programming in the curriculum of the subject of Technology with ICT in the lower secondary schools of Kosovo. In the absence of an integrated plan for programming, students are unable to take advantage of technology experiences and are not prepared for the programming and technology job market. To address this need, it is necessary for educational institutions in Kosovo to work together with industry to improve the technology and programming curriculum. Through this collaboration, students will have the opportunity to benefit from experiences in the field of technology and will be better prepared for the job market in the field of programming and technology.

In addition, the findings of this study show that there is a need to improve the way technology is currently used in teaching in Kosovo's lower high schools. It is important that teachers have ongoing training and are aware of the latest technology and best practices for using technology in teaching. Through this, students will be able to benefit from experiences and technology in teaching will be more effective and suitable for their needs. In relation to the first aim of the study, identifying the need for the integration of programming in the curriculum of the subject of Technology with ICT in the lower secondary schools of Kosovo, the results showed that there is a clear need for this integration. The majority of lower high school students do not have the opportunity to study programming, which makes them less competitive in the job market. Therefore, the integration of programming in the curriculum of the subject of Technology with ICT can help prepare students for the labor market in the field of technology. The second goal of the study was to identify the necessary skills of students to prepare for the job market in the field of programming and technology. The results showed that students should have basic programming knowledge, including knowledge of various programming languages such as Python, Java, C++, etc. Other skills such as analysis and problem solving, collaboration and creativity were also rated as important in this area. The third purpose of the study was to assess how technology is currently used in teaching in Kosovo's lower high schools and to identify needs for improvement. The results showed that most teachers do not have the opportunity to learn programming.

4. CONCLUSION

In this study, a review of the literature was made on the integration of programming in the curriculum of the subject of Technology with ICT in secondary schools in Kosovo. Through the study of the literature, the experiences of other countries in this field were observed and the possible challenges and obstacles that may be encountered in the process of integrating programming into the curriculum of the subject of Technology with ICT in the lower secondary schools of Kosovo were identified. The analyzes of this research show that the integration of programming in the curriculum of the ICT Technology subject in Kosovo's secondary schools is important for the preparation of students for the information and communication technology labor market. However, the planning of the teaching program should pay attention to the possible challenges and obstacles that may be encountered in this process, such as the lack of resources and technological tools, as well as the need for teacher training. Also, through the analysis of the literature, it was evident that programming is a subject of particular importance in the current time, as it has a deep impact on the field of technology and its further development. Along with this, it was evident that the integration of programming in the curriculum of the subject of ICT Technology has significant benefits for students, including the development of analytical, critical and creative skills, as well as the ability to solve problems and use technology in smart way. In some countries around the world, this process has been combined with broader approaches to STEM (Science, Technology, Engineering and Mathematics), giving students a broader perspective on technology and its industry. during this research some of the most popular programming languages such as Scratch, Java, C++, HTML, CSS and JavaScript have been reviewed and analyzed. The study has shown that programming languages are important for the development of students' skills in the field of technology and programming. To conclude, the integration of programming in the curriculum of the ICT Technology subject in Kosovo's lower secondary schools is important to prepare students for the information and communication technology labor market.

Based on the results and discussions of this study, there are some recommendations for educational authorities, higher education institutions and lower secondary school educators in Kosovo: The integration of programming in the curriculum of the subject of Technology with ICT in the lower secondary schools of Kosovo should be done in a progressive and direct manner. Education authorities must provide sufficient tools and resources for this process and educators must have the necessary training to prepare for this change; Teaching should be practical and applied, focused on developing students' practical skills in programming and technology. This change in focus should be reflected in the curriculum and teaching methods, and should also include technological tools such as software and devices that can assist in teaching; Students should be prepared for the job market in the field of programming and technology. This can be achieved through the provision of extracurricular courses, training and internships in the field of technology and programming, and through collaboration with companies in the technology industry; It is important that educational authorities provide sufficient technological resources and tools for students, and help develop the technological infrastructure in lower secondary schools. This will help improve teaching and develop students' skills in programming and technology; In order to achieve a successful integration of programming in the curriculum of the subject of Technology with ICT in the lower secondary schools of Kosovo, it is necessary for the educational authorities to prepare long-term plans for the development of this sphere. This will include consultations with experts in the field, the development of pilot projects, monitoring and evaluation of the process of integrating programming into the curriculum of the ICT Technology subject; Programming should be fully integrated into the curriculum of the ICT Technology subject in Kosovo's lower secondary schools, adding teaching hours and making it a regular part of the lesson.

The research contribution of this study is in providing an in-depth and structured analysis of the various challenges that affect the success of the integration of programming in the school curriculum. Our research has strengthened our understanding of the needs of students in developing programming skills, as well as the needs of teachers regarding their training and preparation to teach this subject. Also, we have identified and analyzed the experiences and practices of other countries in the integration of programming in the curriculum of the subject of Technology with ICT. This research contribution offers us a broad perspective on the successful ways of integrating programming in the field of education and the possibilities of their transfer to the specific situation of Kosovo's lower secondary schools.

The implications of this study include: The identification of challenges, needs and potentials in the field of education and technology, and can be used as a valuable resource for future research and educational policies; The study provides detailed knowledge and practical guidance for teachers, school leaders and policy makers regarding the integration of programming in the curriculum of the subject of Technology with ICT; The study identifies various areas for further research in the field of programming integration in secondary education. The challenges and potentials that emerge from the research can be a fruitful source for further research, focusing attention on specific aspects of improving the teaching of programming and developing technology resources for lower high schools; The study can serve as an important source of information for the design of education policies and to address the current and future needs of secondary education in Kosovo.

Due to time and resource constraints, it was difficult to conduct an empirical study that represents all lower secondary schools in Kosovo under study. This can bring a closer approach to the situation and needs of these schools, missing the full perspective of secondary education at the national level.

Future research in this field can be done by conducting a study with experts in the field of programming, with designers of curricula for the subject of technology, teachers of technology and especially students to understand that it is really necessary to integrate programming into the curriculum of Life and work field.

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