Kosovo

KOSOVO: BIOGRAPHIES

Osman Buleshkaj

Osman Buleshkaj pursued graduate studies in Canada and Slovenia focusing on educational leadership and knowledge management. Osman has been a high school teacher, university professor and leadership trainer. He has been a consultant for teaching, leadership and education policy with various national and international organizations supporting education reforms in Kosovo in the last 15 years. He currently works as an Associate Researcher with the Kosovo Pedagogical Institute.

Fatmir Elezi

Fatmir Elezi completed his university studies at the Faculty of Education in the subject of mathematics. For three years he worked with the lower secondary school as a mathematics teacher. For 21 years, he has been working in the assessment division at MESTI in national student assessments. He has been engaged in the role of data manager for the international studies PISA, TIMSS and PIRLS. He currently holds the position of the Head of Division for assessment standard and monitoring at MESTI.

Selim Mehmeti

Selim Mehmeti pursued graduate studies in University of Pristina, master's degree on educational management. He worked as a high school teacher, researcher, leadership trainer, and educational official in the Ministry of Education. He coordinated and contributed to the development of curriculum for gymnasiums, guides, manuals and by-laws for the implementation of the Strategy for Quality Assurance in pre-university education, Strategy for Teacher Development in Kosovo. His area of expertise is training of school principals for management of education and quality assurance. His research covers the themes of educational policy, advancement of leadership in education in Kosovo, teacher development, curriculum implementation, quality assurance, assessment in education. He published many professional articles for the research and analysis in fields and issues of interest to education in general.

E-TESTING AND COMPUTER-BASED ASSESSMENT IN KOSOVO

Abstract

As Kosovo invests in improving its digital infrastructure and widening access to digital resources, it paves the way for adopting e-testing and computer-based assessments. In recent years, e-testing and computer-based assessments have been used in Kosovo during international assessments such as PISA and TIMSS. These implementations faced challenges related to infrastructure, access, and preparation. Additionally, various schools in Kosovo have adopted online platforms for computer-based assessments, more about the circumstances created in the conditions of the COVID 19 pandemic. However, these efforts currently lack cohesive national policy guidance.

This study aims to investigate the current state of e-testing and computer-based assessments in Kosovo, focusing on infrastructure, access to technology, training provisions, and an analysis of the benefits, challenges, and potential for application. A mixed-methods approach will be employed, sampling policy makers, staff responsible for planning and organizing national and international assessments, educators, and representatives of donor organizations.

While e-testing and computer-based assessments offer promising avenues for advancing Kosovo's education system and aligning it with international standards, successful implementation depends on addressing challenges in infrastructure, access to training, and policy.

1. Introduction

The incorporation of technology in education has transformed traditional teaching approaches, offering more dynamic and interactive learning experiences. It is widely acknowledged that integrating digital technology in the education system is an asset for both teachers and students. The use of high-quality equipment such as computers, tablets, projectors, televisions, and so on, can facilitate the learning process and directly contribute to preparing students for more successful careers in an increasingly digital future.

In their review, Shute and Rahimi (2017) suggested that computer-based assessment (CBA) for learning (CBAfL) will contribute to improving personalized learning in a variety of contexts, and that the innovative CBAfL techniques will move beyond the laboratory works into more practical applications in many subjects. However, they claim that application of CBA will overcome boundaries between instruction, learning and assessment so the need for high-stake tests of learning will become unnecessary. While different education systems advance in CBAfL, teachers will have to be trained to provide targeted support and personalized learning for diverse

students, continues and formative assessment will replace formal exams, and that students will be equipped with the knowledge and skills needed to succeed in the 21st century (Shute & Rahimi (2017).

Technology has created new learning opportunities, thereby enhancing the effectiveness of teaching and learning. The internet has granted students access to a wide range of information and resources from around the world, encouraging them to improve their research skills. Another significant advantage of using technology in schools is the availability of virtual labs and various educational games designed to help students grasp different concepts in certain subjects, thereby enhancing the learning experience by making it more interactive (Haleem A., et al, 2022). Furthermore, technology has provided students with new opportunities to collaborate and communicate, allowing them to work together on various project assignments regardless of their location. On the other hand, technology has simplified classroom management for teachers by enabling them to use digital tools such as online materials or textbooks, to assess and grade assignments, to keep records of student participation, and to monitor their progress. These tools save teachers time and make the learning process more efficient (Camilleri, M.A., Camilleri, A.C., 2017).

The first volume of PISA results from the OECD explores the use of technology for learning and its relationship with PISA scores (OECD, 2023). The findings from PISA 2022 indicate that students who spent up to one hour per day using digital devices for learning activities at school, regardless of their socio-economic background, achieved mathematics scores that were 14 points higher than their peers. This positive association was observed in more than half of the education systems included in the analysis, comprising 45 countries and economies with available data (OECD, 2023).

According to the PISA 2022 Results, students are confident in using digital technology for distance learning, but they still prefer to learn autonomously. For instance, across all OECD countries, approximately three out of four students reported feeling confident or very confident about using learning management systems, digital learning platforms, or video communication programs, but they also expressed the need for guidance and support from teachers. This highlights that merely providing training on technological tools is insufficient; students must also be prepared to take responsibility for their own learning (OECD, 2023).

The average PISA test scores of Kosovo students with access to a digital environment at home were consistently higher than those without, across all subjects. Regarding the frequency of learning activities conducted with digital resources, over 80% of teachers reported using digital resources for many learning activities. Common practices included utilizing online tools for student assessment and providing access to learning materials for students unable to attend classes physically. However, most teachers indicated that they implement these activities only once or twice a month (OECD, 2023). Therefore, it is essential for the Ministry of Education and supporting institutions to take actions and assist teachers and schools to effectively utilize digital technology. Consequently, such support would help build capacities for implementing e-testing and computer-based assessment in Kosovo.

There is a shortage of digital equipment in Kosovo schools, with computers, projectors, digital boards, printers, and internet devices being among the most essential. Even in schools with

sufficient devices, many are outdated, slow, or partially non-functional due to a lack of ongoing maintenance. The use of technology presents a challenge due to inadequate training of teachers. Data from a report published by KCDE for Prishtina municipality indicates that in classes where technology is used for teaching activities, students perceive greater involvement from their peers, and teachers are eager to incorporate technology more frequently (KCDE, 2023).

The education system in Kosovo primarily relies on traditional methods of learning, with limited integration of technology (KPI, 2020). Schools still report an insufficient number of computer labs and limited internet connectivity. Despite these challenges, teachers found that online learning not only served the purpose during the emergency closure of schools but also had a positive impact on their attitudes toward integrating digital components into their traditional teaching methods (Morina et al, 2020). Therefore, to present a brief overview of e-testing and computer-based assessment practices, this report shall provide an analysis of relevant education policies, the capacity building of teachers in digital technologies, examples and experiences from classroom applications, and strategic interventions planned in the following years.

2. Relevant educational policies

Educational policies, as well as procedures and approaches to student assessment in Kosovo, have been analyzed and discussed, focusing on the reference elements related to electronic testing and computer-based assessment. In this process, the reference elements include relevant educational policies that are in the process of implementation, such as strategic documents, curriculum provisions for pre-university education, and instructions for student assessment in the pre-university education sector.

Education Strategy. The Education Strategy is the main document for the development of the education sector in Kosovo in the period 2022-2026 (MESTI, 2022a), there are five strategic objectives, defined for the five priority areas. The student assessment component is addressed in Strategic Objective 2: Raising the quality of pre-university education through the consolidation of quality assurance mechanisms and the provision of quality teaching. Within this objective, the creation of the Center for Evaluation and Standards is foreseen to ensure sufficient human capacities that will increase the reliability of the tests.

While within the framework of Strategic Objective 5 - Digitization of education, in addition to the creation and functionalization of a comprehensive digital platform for the field of education, a special component is also foreseen related to the development of digital competence in function of the successful digital transformation of education, which also includes the development of digital competence among teachers in the field of assessment, namely the use of digital strategies and technologies for improving assessment.

The Education Strategy does not envisage any special and direct measure for the organization of electronic testing and computer based assessment, at the same time it does not prohibit it but let it be understood that this can be achieved based on the progress for the Digitization of education.

Curriculum provisions. The curriculum system of pre-university education consists of the conceptual document defined in the Curriculum Framework for Pre-University Education (CFPE) in Kosovo (MESTI, 2016); the Core Curricula for the formal levels of education including primary education (MESTI, 2017a), lower secondary education (MESTI, 2017b), and upper secondary education (MESTI, 2017c). For each of the education levels, the specific subject curricula are provided for every curriculum field and grade level.

In relation to student assessment, the CFPE document describes the general goals, principles, and types of assessment to ensure consistency and consistency of the student assessment system. The CF encourages the balanced use of different assessment approaches for systematic monitoring and evaluation of students, moving towards competency-based assessment (MESTI, 2016).

CF defines two types of student assessment, internal assessment at the school level and external assessment by the central authority for assessment authorized by the Ministry of Education. According to the CFPE, internal evaluation is done at the school/class level by schoolteachers and according to the description of the procedures and criteria for each type of internal evaluation, regulated by by-laws. Whereas the external assessment is a standardized assessment to measure the level of achievement of learning outcomes, mastery of competencies at the end of level I, II and III of pre-university education.

Based on the definitions set out in the CFPE document for the learner assessment component, breakdowns for the details of learner assessment go further into the Core Curricula for the formal levels of education and the subject curricula for each grade.

None of the curriculum documents directly describe or define the organization of electronic testing and computer-based assessment. At the same time, curriculum documents do not prohibit this form of evaluation and indirectly allow the possibility of such approach to improve and advance the evaluation process in general (MESTI, 2016).

The Framework for Assessment. The Framework for Student Assessment (FSA) in pre-university education level in Kosovo presents a coherent and comprehensive description of how internal assessment, external assessment, and international assessment are organized and integrated (MEST, 2020). The document describes in detail:

- General characteristics of student assessment.
- Student evaluation procedures, internal evaluation, and external evaluation.
- Student evaluation capacities.
- Approaches to building capacities for student assessment.
- Reporting and using student assessment findings.
- Future developments in national student assessment.

In addition to the descriptions above, the assessment framework in separate chapters deals with the aspects of teacher evaluation and the aspects of school evaluation, in connection with the evaluation of students. While in a separate chapter, the evaluation of the educational system is dealt with in connection with the role of student evaluation.

The Framework for Student Assessment (FSA), among other things, provides guidelines for internal assessment and external assessment of students. In relation to the internal evaluation, the framework instructs teachers to respect the requirements of the curriculum for the evaluation of students, according to which: (i) the evaluation of students must be guided by the evaluation principles; (ii) the main focus of internal assessment should be to support students' learning to master the competencies and this is best achieved by the combination of formative assessment (for learning) and summative assessment (of learning); and (iii) internal assessment should enable all students to express new knowledge and show the level of competence mastery.

As for the external assessment, the FSA regulates the assessment of students at the national assessment level happening at the end of 5th grade, 9th grade and the Matura Exam at the end of 12th grade. The framework for national assessments instructs the central authority for assessment authorized by the Ministry of Education to develop follow-up instructions for the preparation of assessment requests/questions. Instructions include guidelines for preparation of test models, reporting forms at the end of national assessment, and information for the general public and the educational community at large (MESTI, 2020).

Like other documents, the FSA for pre-university students in Kosovo does not directly describe and guide the organization of electronic testing and computer-based assessment. However, the framework promotes the use of empirical data and supports the transition to evidence-based decision-making, so that it is understood that this data can also be provided through the organization of electronic testing and computer-based assessment.

In addition to the Framework for Student Assessment, the Ministry of Education has adopted a bylaw on assessment in pre-university education which is based on principles of transparency, impartiality and trustworthiness (MESTI, 2022b). For the purpose of this study, we analyzed the possibilities to conduct electronic assessment as regulated by this bylaw. It can be stated that electronic assessment can fulfill these principles very well, and it provides for a good opportunity to create an electronic evaluation system that fully supports the contemporary requirements for quality and successful evaluation. However, implementation of e-testing and computer-based assessment, is challenge that requires institutional support, relevant infrastructure, as well teacher training and capacity building programs.

3. Trainings for teachers

According to the educational legislation in Kosovo, the policies of professional development of teachers are directed by the Ministry of Education. Ministry is responsible for regulating the system of career development of teachers, creating mechanisms for the implementation of professional development of teachers, drafting standards for ensuring quality, but also for accreditation of in-service teacher training programs.

Programs for teacher training in the field of student assessment were identified and analysed from the catalog of accredited and approved programs for the professional development of teachers and education leaders (MESTI, 2022/23). The emphasis of the analysis was placed on the argumentation that teacher training programs in the field of student assessment include the development of teachers' competencies related to assessment approaches and the practice of electronic testing and computer-based assessment.

Analysis of the catalog of accredited and approved programs for the professional development of teachers and educational leaders, fifth edition (MESTI, 2022/23), showed that out of a total of 115 thematic programs for teachers and education leaders, 4 of them are directly related to the field of student assessment:

- Reading assessment in the early grades.
- Summative assessment of students: Designing the test.
- Assessment of students based on evidence.
- Online assessment and ongoing student support.

Training programs, early grade reading assessment, and evidence-based student assessment do not address and provide elements related to assessment approaches and the practice of electronic testing and computer-based assessment.

Meanwhile, the training program: ***Summative Student Assessment: Test Design***, addresses and provides approaches and practices related to assessment that can be applied in the classroom, but also through electronic testing and computer-based assessment. Among other things, the training content focuses on the topics below:

- Developing the test and linking the questions/requests to the learning outcomes for the field and competencies for the curricular level.
- Test table, standard procedures for designing a test, scoring, and returning points to the grade.
- Designing questions according to Bloom's Taxonomy for knowledge levels, improving questions, test content.
- Types of questions, instructions for writing questions, questions with completion, questions with alternatives, questions with association, questions with graphic presentation, questions with structured answers, rules for writing them.
- Problems, the structure of their solution. Designing questions/requests and linking them to learning outcomes for domain and competency for degree.
- Analysis of the test/questions. Question analysis, question difficulty, question discrimination, alternative frequency.

E-testing and computer-based assessment issues are addressed directly and more comprehensively in the Programme, Trainer: Basics of Online Learning offered by the local organization Kosovo Centre for Distance Education (KCDE), respectively in the module: Online Assessment and Ongoing Learner Support. To illustrate this, in the following section we present three topics of the online assessment module as provided by the KCDE:

Online assessment: An introduction
Topics to be covered:

- Main evaluation methods.
- Analyzing and discussing examples of online assessment.
- Formative and summative assessment methods and strategies.
- Presentation of Bloom's taxonomy.
- Analyzing and discussing assessment questions.

Assessment in LMS
Topics to be covered:

- Understanding the main features of a quiz.
- Creating assignments in Moodle.
- Creation of multiple-choice tests.
- Creation of a series of evaluation methods in Moodle (quizzes, rubrics, etc.)
- Using different question formats (open/closed questions; multiple choice)
- Creating a quiz in Moodle.

Use of online assessment platforms
Topics to be covered:

- Reading materials on common online assessment platforms.
- Exploring the Socrative platform with a step-by-step video.
- Setting up a quiz.
- Using one of the assessment platforms and creating a quiz.

To otherwise empower the usage of the LMS, a comprehensive Training of Trainers (ToT) program of Instructional Designers got developed and conducted by the Kosovo Centre for Distance Education (KCDE). The 5-weeks long TOT program covered various aspects of digital education, including components, methodologies, and the use of Moodle e-learning tools and techniques. In addition, a 2nd edition of the ToT program is further intended to start later in 2024. The team should thus be empowered to offer the program beyond this implementation period on its own. To ensure quality of learning content on its LMS, a digital content framework was additionally developed and introduced. Currently, there are around 30 participants attending the second edition of ToT. This shall contribute to building capacity for future trainings in this field.

The online assessment module and the continuous support of students is a good opportunity for teachers to develop competences in the field of assessment, particularly for assessment approaches and the practice of electronic testing and computer-based assessment. However, this program, from the duration of the accreditation and the possibility of offering the involvement of teachers in this training program, does not ensure the minimum of raising the capacities of teachers at the level of the system to apply electronic testing and evaluation through the computer.

4. Examples of the application of e-testing

At the school level. There are several platforms that are present in Kosovo, and schools occasionally use them to facilitate the implementation of the lesson, such as: School.Me.education, Busulla.com, Teacher gaming platform, and Millennium 3 online e-learning. However, digital learning has more the meaning of the integration of technology in the classroom, and not the integration of technology in different subjects or grades. There are examples from some schools that develop forms of online learning in an individual way, as well as apply forms of e-testing and evaluation through computers.

A report provided by Millennium 3 school (https://mileniumi3.net/publikime/), a non-public scho*ol, shows that e-testing is applied to improve the assessment process through digital pla*tforms, especially Google Workspace for Education and Moodle. Trainings are organized for the use of Moodle, Google Workspace for Education, AI as well as new technologies, and e-courses have been created and made available to all school staff.

Google Workspace for Education is used as the primary platform, where all learning materials, assignments and student projects are placed. Within it, Google Forms is used in the evaluation process. Teachers create personalized quizzes and tests using the various options, which can include different types of questions such as multiple-choice, short-answer, and essay-type questions. The ease of use and approach of Google Forms has improved the assessment process, allowing teachers to create, distribute and grade tests efficiently.

In addition, the school uses Moodle as a second platform. On this platform, each teacher has created his own e-course. Within this course, they create quizzes and tests, which can be customized with different question types and settings. In addition, they also use Moodle's powerful features that support secure test administration, using the Safe Exam Browser. Implementation of e-testing has brought many benefits for both students and teachers of this school. Students appreciate the convenience and flexibility of electronic testing, allowing them to complete assessments at their own pace and receive immediate feedback on their performance. Teachers, in turn, have seen improvements in assessment efficiency, assessment accuracy and access to secure data. E-testing has also facilitated a seamless transition to distance learning during times of disruption, especially during the COVID period.

At the Ministry of education level. Evaluo.ORG was an all-inclusive cloud-based testing platform created in Kosovo, and it supported online creation and delivery of professional, feature-rich tests. The platform came with its own apps for using on IOS and Android devices as well

as with its responsive web interface for using on desktops. 'Evaluo' provided support for all testing processes: from test creation, test delivery, candidate management, results reporting and analytics. This platform provided support for more than 15 different question types, which could be used for easy creation of tests, as well as question banks.

Question banks served as repositories for questions of different categories, types, as well as difficulty levels. For each created question, authors could also include reference to syllabus, learning materials or other references. In this way they could create tests to be used as diagnose tests or preparatory tests. Test authors had the option to publish tests as public, private, or only for themselves. In case of public tests, which were accessible through everyone, test authors could choose to share the news through all social media and different communication channels.

The delivery of private tests was supported by the Exam-Manager, which allowed scheduling of exams, creation or selection of candidates, invitation of candidates, as well specification of additional exam characteristics, such as shuffling of questions, bulk scheduling, manual scheduling, retakes, number of times test can be taken, surfing through tests, etc. Test taking for candidates was very easy. In case of public tests, candidates could take the test in their preferred device (mobile, notebook, tablet, or desktop). Upon finishing the test, platform automatically would generate the results, which can be analyzed by candidate, or test authors. And finally test authors could generate detailed reports and use excellent analytics.

'Evaluo' was developed in accordance with the best practices and fulfilled all the required standards for web and mobile applications. The technologies used for 'Evaluo' were: Java SE, Swift, PHP, Laravel, MySQL, ReactJS, Ajax, HTML5, CSS3. **API Application Program Interface –** modern API was built with Ajax, PHP7 and Laravel 5.5 and came with the highest level of security currently available (Passport Oauth2). **Android OS –** The android application was built in the JavaSE programming language. The application's architecture was MVC - Model View Controller and the database for storing local data was used Shared-Preferences and SQLite. **iOS –** The iOS application was built in the Swift. For the storing of local data, the User Defaults and SQLite was used, and application's architecture was MVC. **WEB –** the web interface was developed by using the latest technologies, such as HTML5, jQuery, CSS3, JavaScript, etc.

A study was conducted by Thaçi (2019) on application of e-testing for Matura exam at the end of pre-university education in Kosovo. To advance the Matura Test process at the national level, the Ministry of Education in Kosovo planned to conduct the Matura Electronic Test in 2017. An application named MATU application was created with electronic tests for students. The purpose of the application was to prepare the students for the electronic Matura exam so that they would be familiar with how an electronic Matura assessment works. By downloading the application, they would take the tests prepared for eight subjects. The tests had similar design and similar questions with the Matura exam. After they had completed the tests, the application enabled the students to receive the results at the same time immediately after the test was completed. The idea was to increase their interest and motivation to attend the Matura exam electronically.

The MATU application preparation test contained 24 tests, 8 for grade, as follows: 8 for grade 10, 8 for grade 11 and grade 12 for the following subjects: Mathematics, Physics, Chemistry, Biology, History, Geography, English and Mother tongue. This study (Thaçi, 2019) investigated the use of MATU application and its effect on students' interest to being evaluated electronically. This analysis included only the cases of students who downloaded the application and completed the test. In 2017, there were 24,152 high school graduates in Kosovo of which 7,332 or 29.59% of graduates registered to take MATU test online.

Taking into consideration that the launch of this application was made without supportive information campaign and considering the high interest of graduates to participate online, it was considered that Kosovo could move towards the full digitization of Matura test under the condition that relevant technologies are made available to schools, teachers were trained, and students were informed timely and accurately (Thaçi, 2019). It is worth noting that that this process did not continue due to technological and budgetary implications it entailed.

5. Conclusions and recommendations

Even though the period of the COVID 19 pandemic has influenced the rise of this need, it has not been taken seriously by the institutional mechanisms of the education system in Kosovo. Participation in trainings related to application of technology and computer-based assessment continues to be driven by program providers' capacities and not Ministry of Education funding and support. There are several platforms that are currently utilised in Kosovo, and schools occasionally use them to facilitate the implementation of the lesson. In addition, the Ministry of Education had a project to develop online resources for application of e-testing and computer-based assessment, and a pilot Matura exam was conducted online. However, e-testing and computer-based assessment are still not developed and not integrated into teaching, learning and assessment practices in Kosovo. Digital learning in Kosovo has more the meaning of the integration of technology in the classroom, and not the integration of subjects or classes into technological tools. In cases where schools choose to use teaching and learning alternatives, they use various platforms and online teaching programs. As such, there are examples from some public schools and private schools that developed forms of online learning and assessment, which the central education institutions could learn from. Kosovo has a five-year strategic plan to digitalize the education system and work to improve the infrastructure required for application of technology in teaching and learning.

References

Camilleri, M.A., Camilleri, A.C. Digital Learning Resources and Ubiquitous Technologies in Education. Tech Know Learn 22, 65–82 (2017). https://doi.org/10.1007/s10758-016-9287-7

Haleem et al., (2022) Understanding the role of digital technologies in education: A review, Sustainable Operations and Computers,Volume 3, Pages 275-285, ISSN 2666-4127, https://doi.org/10.1016/j.susoc.2022.05.004

KCDE (2023). Digital School Mapping in the Municipality of Pristina through Focus Groups. Prishtina, XK: funded by UNICEF office in Kosovo. Retrieved from https://kcde-ks.org/hartezimi-digjital-ishkollave-ne-komunene-prishtines-permesfokus-grupeve/

Kosova Pedagogical Institute (2020). Mësimi në distancë/e-mësimi në arsimin parauniversitar në Kosovë, në rrethanat e krijuara nga pandemia Covid-19: Përmbledhje e hulumtimit [Distance education/e-learning in pre-university education in Kosova under the circumstances created by the Covid-19 pandemic: Research summary]. Retrieved from https://ipkmasht.rks-gov.net/wp-content/uploads/2021/02/Mesimi-ne-distance-E-mesimi-ne-arsimin-parauniversitar-ne-Kosove-ne-rrethanat-e-krijuara-nga-pandemia-covid-–-19-2020.pdf

Ministry of Education, Science, Technology and Innovation (MESTI) (2016). *Kosovo Curriculum Framework*, MESTI, Prishtina, RKS. Available online at: https://masht.rks-gov.net/korniza-kurrikulare-e-arsimit-parauniversitar-te-republikes-se-kosoves/

Ministry of Education, Science and Technology (MEST) (2017a) *Core Curriculum for Education Level 1*, MEST, Prishtina, RKS. Available online at: https://masht.rks- gov.net/uploads/2017/02/kurrikula-berthame-1-finale-2.pdf

Ministry of Education, Science, Technology and Innovation (MESTI) (2017b) *Core Curriculum for Education Level 2*, MEST, Prishtina, RKS. Available online at: https://masht.rks- gov.net/uploads/2017/02/korniza-berthame-2-final_1.pdf

Ministry of Education, Science, Technology and Innovation (MESTI) (2017c) *Core Curriculum for Education Level 3*, MEST, Prishtina, RKS. Available online at: https://masht.rks- gov.net/uploads/2017/02/korniza-berthame-3-final.pdf

Ministry of Education, Science, Technology and Innovation (MESTI) (2020). The Framework for student assessment in pre-university education in Kosovo. Prishtina, XK: MESTI. Available online at: https://masht.rks-gov.net/korniza-e-vleresimit-te-nxenesve-te-arsimit-parauniversitar-te-kosoves-2/

Ministry of Education, Science, Technology and Innovation (MESTI) (2022a). The Education Strategy 2022-2026. Prishtina, XK: MESTI. Retrieved online from: https://masht.rks-gov.net/wp-content/uploads/2022/11/03-Strategja-e-Arsimit-2022-2026-Eng-Web.pdf

Ministry of Education, Science, Technology and Innovation (MESTI) (2022b). The administrative instruction nr. 06/2022 on student assessment in pre-university education of the Republic of Kosovo. Retreived online from: https://masht.rks-gov.net/wp-content/uploads/2022/09/UA-PER-VLERESIMIN-E-NXENESVE_Final-ISNIU-e-derguar-tek-SP-per-nenshkrim-00000002h.pdf

Morina M., Uka, A., Raza, K. (2021). A Case Study on Kosovan Teachers' Transition to Distance Education during COVID-19 Pandemic, International Journal on Innovations in Online Education. https://doi.10.1615/IntJInnovOnlineEdu.2021038933

OECD (2023), *PISA 2022 Results (Volume I): The State of Learning and Equity in Education*, PISA, OECD Publishing, Paris, https://doi.org/10.1787/53f23881-en

Shute, V. J. & Rahimi. S. (2017). Review of computer-based assessment for learning in elementary and secondary education. *Journal of computer assisted learning. Vol 33*(1), p. 1–19. https://doi.org/10.1111/jcal.12172

Thaçi, L. (2019). The impact of the matu application on the students' interest in Kosovo. A paper presented at 14th International Balkan Congress for Education and Science in Ohrid, North Macedonia. Retreived online from: https://www.researchgate.net/publication/343451952_THE_IMPACT_OF_THE_MATU_APPLICATION_ON_THE_STUDENTS'_INTEREST_IN_KOSOVO