Inclusive Digital Education: The Case of Bosnia and Herzegovina

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Abstract

This chapter describes the education system in Bosnia and Herzegovina (BiH) as well as the situation regarding inclusive education and digital education in the country. It focuses on if and how inclusive education and digital education policies consider students with disabilities/special educational needs (SEN).

This chapter analyzes five lessons in which teachers used digital technologies in an inclusive setting in four primary schools. In all lessons, teachers pointed out that students enjoy using digital technology, and that technology has a motivating effect on their learning behavior. Results show that digital technology is more interesting for students than traditional pedagogical approaches, content acquisition is easier, there is more class participation, teachers have more activities to choose from and need less time for lesson preparation.

However, there is still a major gap in BiH between policies and everyday practice. When it comes to inclusive education, there is a divergence between BiH's legal framework and reality in the schools.

Bosnia and Herzegovina's education system and inclusive education

The education system in Bosnia and Herzegovina (BiH) is complex and decentralized. There are two entities in BiH, Republika Srpska and the Federation of Bosnia and Herzegovina (including 10 cantons), and one district (Brčko District), all of which are responsible for education policy and funding in their respective areas (Pasalic-Kreso, 2002). "It is difficult to refer to the education system in Bosnia and Herzegovina (BiH) as a single system," as one study recently put it, "it is more a network of different [education] systems within the context of a single state" (European Training Foundation [ETF], 2019, as cited in ETF, 2020a, p. 8). While the challenges of this system have been discussed elsewhere (e. g., Beljanski & Bukvić, 2020, p. 4–5), general policies do indeed guide the system. Education is compulsory and free for all children from six to 15, and it lasts for nine years. Secondary education is also free. Students start secondary schools at 15, and this lasts either three or four years, depending on the school type (technical or general secondary school).

When it comes to special education and inclusive education, there is a divergence between BiH's legal framework and reality in the schools. Legally speaking, students with SEN can either attend a mainstream school or a special school, which is a designated center for special education and rehabilitation (Biscevic et al., 2017). BiH, moreover, has committed itself to inclusive education by joining various international conventions and agreements. But on the ground, the government overlooks students with SEN (Risher & Kabil, 2010) and struggles with fulfilling its legal obligations. This is due to a variety of reasons, including a lack of adequate infrastructure (i. e., accessibility issues in mainstream schools) and funding (e. g., Memisevic & Hadzic, 2013), which hinders inclusion before it can even get started. Teacher education programs, moreover, are not preparing pre-service teachers for inclusive education settings (Somun Krupalija, 2017). This results in major differences between the educational opportunities available to children with and without SEN as well as major divergence between legal frameworks and school realities.

Digital education in Bosnia and Herzegovina

Although BiH's education system is divided, its Common Core Curricula (CCC) provides an important basis for establishing coherence across the education systems. Digital Skills and Competences (DSC) are one of the key competences in the guidelines for the CCC implementation. DSC are currently acquired through traditional information and communication technology (ICT) courses. While stakeholders at all levels contend that DSC are critical for education and training, they are still in the developmental phase. The CCC provides here a comprehensive approach to integrate DSC into all components of education.

"Each level of governance needs to develop its curricula based on the [CCC increasing the] quality of DSC in [education] (ETF, 2020b, p. 3). However,

> the absence of established and reliable monitoring and assessment mechanisms, at both state and entity as well as Brčko District levels, prevents constructive policy development and tracking the effectiveness of existing DSC programs. This is coupled with a lack of funding, as a result of which the general infrastructure in schools for advanced DSC education relies mainly on donor investments, and is therefore inadequate (ETF, 2020b, p. 3).

Despite recent reforms attempting to tackle the issue, infrastructure and equipment differ from school to school and between and within cantons. Secondary schools are better equipped with digital technology than primary schools (ITU and UNICEF, 2021). It is important to note that at the primary level, there are no explicit learning objectives regarding digital education because digital competence is not included in curricula at this level. The teachers and other staff members who are involved in education still have undeveloped digital skills, which is another barrier to digital transformation occurring in the country.

The COVID-19 pandemic made these challenges even more difficult to overcome. In response to the fallouts caused by the pandemic, three UN agencies in BiH – UNESCO, UNICEF, and ILO – with support of UN volunteers joined efforts to support the education authorities to address learning inequalities, while focusing on the most marginalized through implementing a human-centered and gender responsive project "Re-imagining Education for Marginalized Girls and Boys during and post COVID-19 in Bosnia and Herzegovina." The main objective has been to support the public education sector in three selected education administrative units (Republika Srpska entity, West-Herzegovina Canton, and Una-Sana Canton). It has been focusing on improving the quality of e-learning and blended learning practices. It supported learning continuity, strengthened teachers' digital skills and competences, prevented dropouts, and ensured inclusive education for all (United Nations in Bosnia and Herzegovina, 2021).

To sum up, although BiH has developed initiatives to support the use of digital technology in the educational sector, none of these are currently targeting students with SEN. Although students with SEN are present in mainstream classrooms, current educational initiatives and policies do not discuss inclusive education with digital technologies nor supporting students through assistive technologies.

Inclusive digital education in classrooms: Analysis of lessons

To explore how teachers use digital technology in inclusive settings, five lesson examples were collected from teachers. The next section analyzes those examples from Bosnia and Herzegovina.

Method

The lesson setting

Two lessons took place in a face-to-face inclusive classroom setting (5th grade, religion; 7th grade, civil education), one in a blended-learning format (5th grade, math), and two in a distance learning format during the COVID-19 lockdown period (4th grade, English; 5th grade, social studies). In each class, one child with disabilities was present. The type of disability included various expressions of learning disabilities, cognitive disabilities, and visual and motor skills impairments. An overview of the lessons (context, objectives, teaching method, digital tools used) is shown in Table 1.

Participants

The lessons were collected from five female primary school teachers teaching in inclusive settings in four primary schools. Four examples were collected from three schools from Sarajevo and one from Mostar (Federation of BiH). Two out the four participating teachers from Sarajevo work in one of the ten schools in Canton Sarajevo that were included in a UNICEF training program for how to apply assistive technologies in inclusive education and the use of Boardmaker7 in the teaching process. These two teachers and another one from Sarajevo stressed that their school and classrooms have a good IT infrastructure. One teacher from a different school, however, stated that there was only one computer for the whole class (7th grade, civil education). Like for the Austrian case study, purposive sampling was used, and participants were selected according to the same criteria (see Bešić et al. in this book).

Data collection procedure

To collect at least five examples in Bosnia and Herzegovina, we contacted seven teachers between March 2022 and May 2022 via email who were known to the authors from previous projects and teacher trainings. Participation was voluntary. Teachers were asked to comment on 13 areas within a lesson template, such as lesson objectives, the method or approach that was used, classroom setting, digital technology that was used, and challenges and opportunities in using digital technologies. Teachers had one month to complete the template. The examples were then reviewed by the project members for compliance. In case of open questions, teachers were asked to revise their example.

Data analysis

All lesson examples were coded and analyzed through directed qualitative content analysis (Flick, 2014). As described in the Austrian Case Study (see Bešić et al. in this book), deductive coding was used according to a coding list created by the DigIn coordinator. The last author of this chapter coded the data. Coding conflicts were resolved in a feedback loop between the whole DigIn research team after all examples had been coded.

Table 1: Lesson Overview

N	Context & Target	Objectives	Teaching method	Digital tool(s)
1	7th grade primary school, civil education (21 ss., included 1 with an IEP and many students with difficulties in reading and understanding). Face-to-face lesson. Target: all learners	(1) Promote students' motivation (2) Foster students' critical thinking; development of social skills (4) Enhance digital competence	(1) Frontal lesson (2) Cooperative learning in heterogeneous groups (discussion and analysis of privacy examples) (3) Assessment (4) Homework in groups – create a project about privacy (comic, animated film, etc.)	(1) YouTube (2) StoryJumper: (3) Worksheets with Boardmaker7 (4) Office 365: all materials used in class and needed for homework were uploaded (YouTube links, book chapters, other links)
2	5th grade primary school, math (3 classes, included 1 student with intellectual disabilities, 1 student with conduct disorder) Face-to-face & online lesson Target: all learners	(1) Promote students' motivation (2) Enhancing students' mathematical skills (3) Promote students' creativity, digital competence	(1) Preparation & introduction: Individual work – research online and talking to parents (2) Group work (creation of math equation) (3) Individual work (creation of cartoon, e-book, presentation)	(1) Google (3) Pixton (3) StoryJumper
3	5th grade primary school, social studies (26 ss., included 1 student with visual impairment). 4 online lessons Target: all learners	(1) Development of thematic knowledge (2) Development of digital competence (3) Development of affirmative attitude towards personal and community development (4) Improvement of assistive technology use for the students with visual impairment	(1) Frontal lesson (2) Individual work (3) Collaborative work (students chose/assigned different tasks themselves according to each student's strength) (4) Homework (5) Assessment	(1) Google Meet & Zoom (2) Slido (3) Padlet interactive map: (4) Used as assistive Technology: *explore by touch; KNFB Reader; Vacaroo:* https://voca-roo.com/*Responsove voice* (5) Wakelet (6) IdeaBoardz (7) Genially (8) Rolljak (9) Prezi (10) Google docs

| 4 | 4th grade primary school, English (21 ss., included 1 with intellectual and motor disability). Online lesson

Target: all learners | (1) Development of thematic knowledge (2) Enable student with disabilities to revise content and make memorizing easier | (1) Lecture recording – video lesson (2) Independent work (review – watch and listen – a PowerPoint video in their own time, at their own pace, as often as they want; answer questions, complete exercises according to their needs and pace that suits them) | (1) PowerPoint (2) digital textbook (3) FreeCam (4) LearningApps (5) Teaching platform eSkola.ba: including teaching videos, exercises, and quiz with prompt feedback |
| 5 | 5th grade upper primary school, Religion (18 ss., included 1 with multiple- and severe disabilities). Face-to-face lesson

Target: all learners | (1) Development of thematic knowledge (2) Promote students' critical thinking creativity, digital competence (3) Improving students' relationships | (1) Frontal lesson (2) Cooperative learning in heterogeneous groups (grouping according to different gender and achievement) (3) Individual work (4) Homework (5) Field trip after the lesson – recognize and express the knowledge gained during the lesson | (1) Power Point (2) YouTube (3) StoryJumper (4) Boardmaker7 |

Results

Learning objectives in the competence areas

All lessons referred to the learning pillar "learning to know" (learning to learn) (Delores, 1996). Particularly in two lessons, it was evident that the aim was that students learn to understand the world around them, as this description illustrates: "The purpose of the practice is for the students, based on the acquired theoretical knowledge about the economy of Bosnia and Herzegovina, to obtain the initial competencies for applying them in practice in terms of developing mini entrepreneurship" (example 3, see Table 1).

All lessons focused on the learning pillar "learning to do" as well (Delores, 1996). The knowledge already acquired is to be applied, improved through practice, and demonstrated through self-created products. In line with this, three teachers emphasized creating digital products. These teachers (example 1, 2, 3, and 5) listed acquiring digital competences among the learning objectives. During the lesson, students were supposed to develop a range of digital competences while planning and implementing a project (e. g., creating a presentation, recording, comic; recording and editing of a short animation or video). Within these lessons, "learning to do" also involved working in pairs, small groups, and building common values. Students worked collaboratively on different projects (e. g., presentations).

Two lessons referred to the learning objective "learning to understand" (Schratz & Weiser, 2002). To achieve that objective, teachers encouraged students' desires to discover and learn by providing a choice. Students were able to choose different tasks corresponding with their learning pace and preferred learning paths. In one lesson, for example, students could watch a video multiple times and work according the pace that suited them.

Differentiation

All five teachers recognized the heterogenous learning requirements of their students and took them into account during lesson planning. Using digital technology to achieve learning objectives was emphasized as an important differentiation tool. The five teachers differentiated their lesson by adjusting the content, process, and product (Tomlinson & Strickland, 2005).

Content differentiation

Depending on the disability type, differentiated learning objectives and activities were set for students with disabilities in three lessons. The idea, as one teacher stated, was to "break down the tasks into parts that he can understand" (example 2). The teachers stated that they reduced the amount of new information or, in general, the difficulty levels for the students with disabilities according to their IEP. However, these differentiated learning objectives were not specifically stated or described.

Process differentiation

All teachers adjusted their instruction by implementing different teaching methods. They included frontal teaching, small group work, and independent learning. All of these methods were accompanied by the possibility to listen or read the delivered content and task instruction (i.e., written directions; work sheets that could be printed or watched online with audio). In two lessons (the ones conducted online), students could watch and listen to videos as many times as they wanted since the "materials used in the lesson, as well as additional resources for better understanding of the topic were added to Office 365 for independent use" (e. g., PowerPoint presentations and short video lectures from YouTube). Digital technology played an important part here. Digital technology enabled an alternative for reading. According to one teacher: "Such an approach is favorable for all students as they can follow up the story in their textbooks while listening, thus ensuring better understanding. It is also suitable for visually impaired students, students with Dyslexia, and those who have difficulty reading and understanding" (example 1). A fourth-grade teacher stressed that:

> The advantage in having the video lessons was that the students had access to them at the time that suited them the best. They watched and listened to the lessons as many times as they wanted. They were offered the correct pronunciation of the vocabulary, and they could acquire it without the fear

of making mistakes. The practice was engaging and interesting because it was like the games they play on the computer. They learned through play.

Product differentiation

In two lessons, students could create different products to demonstrate what they learned. Depending on the lesson, students were asked to choose an activity they felt comfortable doing or were interested in. As one teacher stated: "Students were offered various ways of portraying the topic and allowed to choose a way to express their knowledge according to their interests and abilities" (example 1). Another teacher provided the students with different options: "Students decide on the form of expression for their ideas. They can choose to create a cartoon, an e-book, or a presentation" (example 2).

Tool Accessibility

Four teachers said that they chose the particular digital technology due to its accessibility features. They chose accessible digital technology to implement their lesson. One teacher said:

> By using Storyjumper and Boardmaker7, I managed to cater for the students with disability needs. These tools enabled the creation of a multimedia presentation containing text with privacy examples and an audio story for a critical thinking exercise. Considering there are students with an IEP and also those with difficulties in reading and understanding, this approach was accommodating for everyone (example 1).

In the case of a lesson that was implemented online during the COVID lockdown, the teacher combined the digital technology with students' assistive technology when necessary: "During the project, the boy with a disability used one of the specialized tools for visually impaired people" (example 3).

SAMR Modell & 4Cs

When analyzing the examples according to the SAMR model (Puentedura, 2013), three stages were identified. The fourth-grade English lesson enabled a redefinition of the learning task, which would have not been possible in the same way without the digital technology and can therefore be labeled at the "redefinition" stage. According to the teacher:

> Students also had time for independent work. They could see the solutions on the screen after a few minutes and compare their answers to the correct ones. The students did not have a time limit for completing the exercises, they could stop the video, and work according to their capabilities and the pace that suited them (example 4).

In this way, the recorded video lesson, which students could access at any time and throughout the year, enabled students to learn without time pressure and without the fear of making mistakes.

Four lessons can be identified at the second stage (augmentation) of the SAMR model. While digital technology directly was used instead of a more traditional teaching tool or method, it also added other aspects to the learning process beyond convenience. For example, teachers used electronic or web-based versions of the presented content instead of a hard copy, which gave students a clearer understanding of a complex topic. Students also used PowerPoint or Prezi to present information, which, according to the teachers, engaged them more than traditional methods. Students followed an online map of Bosnia and Hercegovina with different activities as well. The digital worksheets also provided different possibilities. As one teacher stated:

> Worksheets can be interactive and used on the PC or easily transformed to printed versions. Students with disabilities benefit as the content can be listened to and the materials can be forwarded to the parents/assistants if needed. The whole class also benefitted since creative, interesting materials were produced to achieve the learning goals. The time needed for special attention and work with pupils with disabilities is shortened or not necessary at all (example 1).

In general, all teachers stressed the importance of digital technology to enhance students' learning experience. As one teacher stated:

> Using digital tools in teaching and while learning math is really effective. The students are more motivated to learn, they have creative solutions, cooperate with their peers, exchange ideas, and present their work. By doing so, they strengthen their skills (example 2).

When analyzing the examples regarding the 4Cs (P21, 2022), all 4Cs (communication, critical thinking, collaboration, and creativity) were mentioned by the teachers. Collaboration was the most frequently mentioned of the four competence areas followed by creativity, critical thinking, and communication. The development of these competencies was seen as a result of the methodical design of the lessons. For example, "collaboration" was encouraged through working in small groups, and "creativity" was supported by the possibility to discover learning and create products using digital technology, "critical thinking" was encouraged by engaging with a particular problem.

Conclusion

In the lessons where digital tools were used effectively, teachers pointed out that students enjoyed using them and seemed to be more motivated to learn. Teachers also perceived content acquisition to be easier for the students as well as an increase in classroom participation. Moreover, teachers could choose from different activities offered as open educational resources and also decrease the time needed for resource preparation. Although teachers were not trained during their teacher training on how to integrate digital technology in their classrooms and how to cater for the needs of students with disabilities in digital education, they were able to differentiate their lessons and offer a variety of learn-

ing opportunities for students with SEN. They also selected the used digital technology in line with the lesson goal and students' needs.

Inclusive education and digital education, however, are processes that are still being developed in BiH. Currently, international organizations – UNICEF in the case of the schools that participated in the DigIn project – are the ones developing initiatives to improve the education sector and "importing" inclusion solutions into the country from NGOs and more developed European neighbors, a phenomenon that has been noticed in other studies as well (Tsokova & Becirevic, 2009). This certainly has benefits for the schools lucky enough to be involved, particularly when it comes to funding and expertise. It also demonstrates that when the required infrastructure and training is available, innovative teaching practices can develop. But it also means only certain schools in certain geographic areas (i.e., the ones that are chosen to participate) are included, which explains why some lesson plans that were analyzed were very well equipped with digital tools and technology while others were not.

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