Smart Schools: Inclusion and Participation of Vulnerable Students During at Distance Learning

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Abstract. Students in many countries during COVID-19 pandemic, moved through a deep change in their school experience, moving from face-to-face teaching in schools to distance learning. The distance learning has represented an opportunity to develop strategies and resources to guarantee continuity in the learning experience. However, the recent literature has highlighted also several factors that negatively affected learning outcome of students, underlined in particular more negative effects on students in conditions of fragility. This work has the objective to analyse problems emerged during DL and reflect on possible solutions, by considering the analysis of data obtained from recent national and international literature. The article proposes a critical reflection to rethink digital learning environments in the post-pandemic era in order to support learning path of all students and promote inclusion and participation also of those in condition of vulnerability.

Keywords: Distance learning · smart schools · vulnerable students · inclusion · participation

1 Introduction

The COVID-19 pandemic has changed, society in profound ways and has widened educational inequalities, disadvantage the most vulnerable segment of the population, with the result of producing a higher risk of early school leaving and failure [1]. Schools all over the word during lockdown in 2020 (corresponding to 95% of the world's student population), have moved from face-to-face teaching in schools to distance learning (DL) [2]. This strategy helped school in maintaining a continuity in the students' learning paths. However, many schools were not prepared for Distance learning and encountered several difficulties in rethinking the instructional design [3].

The Organisation for Economic Co-operation and Development (OECD) highlights as the main problems emerged during DL, regard:

- inequality in the home learning condition: many students had not an own place to study and had to share the home space with the other members of family;
- the lack in online learning support platform: not all schools had adopted a learning platform;

- poor teachers' pedagogical and technical skills: many teachers were unprepared to integrate digital technology in education [4].

Research conducted from 2020 to date shows a loss of learning for students related to the transition from face to face to DL [5]. This loss is also greater for lower income students. The literature highlights how various factors have negatively affected the scholastic pathways of students in conditions of fragility during DL [6], due to the digital divide; the cultural divide and the structural divide. By considering the analysis of data obtained from recent national and international literature, in this work we propose some possible solutions to the problems that emerged during DL.

2 Methodology

A bibliographic search was conducted in the national and international scientific literature relating to DL during the Covid-19 pandemic and hard-to-reach students. The articles published in journals accessible through the ERIC and PsycINFO, Bibliographic databases, the proceedings of the main national and international conferences on DL (such as SIRD [7]) were taken into consideration. Finally, in the desire to obtain the maximum possible coverage, generalist tools such as Google Scholar were also used. The following keywords were used in the literature search: distance learning, COVID-19, vulnerable students, inclusion, participation and educational design.

3 Main Results: From Problems to Solutions

3.1 Home, School, and Community Partnership

The school should be a learning community of which teachers, students, families, and members of the local community are part, working together to enrich the educational institution and enhance not only learning opportunities but also the well-being of students [8]. The COVID-19 pandemic, on the one hand, has made parents less prepared to provide support for their children due to increased economic uncertainty and the demands associated with working from home [9, 10]; on the other hand, it has increased family violence, putting already vulnerable students at greater risk [11, 12].

The sudden shift of learning from school to home has required not only the implementation of new teaching strategies, but also the design of new models of communication between school and home. Epstein [13] identifies four key actions that teachers must take to ensure the success of students who learn from home through available ICT:

- Check-in: the school should regularly check whether students and their families are in good health, whether they need resources and services that the school or community can offer, whether they have specific issues to discuss with teachers, in addition, the school should check whether students regularly attend classes and whether they have time to relax.

- Collect students' work: teachers, students, and parents need to share the criteria for collecting and evaluating work done by students, the procedures related to obtaining "extra credit," and how students and parents will be able to monitor learning progress made by students.
- Engage students with their parents: teachers can give students tasks to be done in collaboration with a parent or other family member in the family's language of origin. This task may relate, for example, to the work of one of the family members or to family traditions.
- Make sure about meals: schools before taking any of the actions just listed must be certain that all students who would normally attend the school cafeteria for free are continuing to eat regularly. The school may organize itself or, for example, seek support from the local community to help families most in need with financial and/or food aid.

Epstein [13] highlights how school closures due to the COVID-19 pandemic clearly demonstrated that for all pupils to be successful in learning from home, it is schools that must produce and disseminate learning activities for their students. Although all families have skills and talents to share with their children, it is not families who have to find ways to think and realize activities to guarantee that their children continue to learn school skills at every grade level.

3.2 Distance Learning and Digital Divide

DL is by no means a new educational approach. However, the COVID-19 pandemic has suddenly and unexpectedly forced many schools worldwide to move from face-to-face teaching to DL. The COVID-19 pandemic, on the one hand, gave important insights into how technologies can be used on a large scale for learning by students of all ages and grades. During the COVID-19 pandemic, there were so many wide scale attempts to utilize technology to support DL. Countries where digitization was adequately advanced adopted distance education, using all kinds of available technologies, and in some cases, it has been so successful that some schools say they plan to continue with blended instruction (face-to-face and distance) for the future [14].

On the other hand, the COVID-19 pandemic has also exposed profound some inequalities present in the education system [15, 16]. 800 million students could not take Distance learning because they did not have a computer at home, about 700 million students because they did not have Internet access from home. Furthermore, approximately 56 million learners live in areas where the mobile network is not available. At least one-third of students are excluded from distance learning because of lack of connectivity and computer. Inequalities in access to ICTs and the skills to use them stand in stark contrast to the right to inclusive education for all.

The use of distance or blended learning necessitates enormous investments in equipment, new learning materials and training. To ensure educational continuity during the pandemic through DL and sustain the strong spread of DL after the pandemic, it is of course not enough to design and disseminate digital solutions for DL. One must be very careful so that technology in education does not strengthen the existing inequalities and does not increase the digital divide. If attention is not paid to this aspect, technology

will become a barrier for students from disadvantaged backgrounds, who will remain excluded from learning. According to Epstein [13] the COVID-19 closures have shown how crucial it is that every school when preparing to do DL is aware of the technologies available in the homes of its students and the strengths and needs of its students to develop and disseminate lessons, projects and activities that are feasible and useful for learning at home of all its students, no one excluded. The shift from face-to-face teaching to DL because of COVID-19 has strongly emphasized how educational policymakers must necessarily focus on ensuring that all students can successfully take DL. District and community resources are necessary to bridge this large digital divide to ensure that all students have a computer and Internet access to be able to take online classes from home with their teachers and classmates. Until there is equity in technology, teachers will need to be especially creative in communicating plainly with parents and students who do not have computers concerning content, homework assigned via television and phone, creative arts, and other traditional learning activities. According to Epstein [13] the following three types of DLs can be put in place to ensure the right to education for all students:

- High Tech Online Learning. Some schools have high-tech platforms that they use both to communicate with families and to give information to students and organize educational activities. Many schools use high-tech resources to find and adapt web content to the grade level and abilities of students. In these settings, parents can typically use technologies to monitor their children's work and progress.
- Low Tech Learning by Doing. Traditional tools such as, for example, pencils and books can be important resources for each student, especially the students who do not have a computer and/or adequate Internet access available at their residence. Teachers can prepare specific assignments for these students and explain to parents how to support students to strengthen scholastic skills and talents through low-tech traditional tools.
- Adaptable Tech: Project Learning. Teachers can define and give projects in diverse topics, of long duration for high school students and of shorter duration for younger students. As a rule, students find the implementation of projects stimulating and fun. These projects can be linked to class work units. In carrying out these projects, students can use the technologies they have at their disposal, whether they are high-tech or low-tech.

3.3 Distance Learning and Active Learning

For many teachers seem to be difficult to use active teaching strategies during DL, preferring teacher-centered methodologies. Teachers report difficulties in actively involving students and stimulating their participation. Many teachers therefore adopt a teaching methodology in which little space is given to interaction with children, favoring the frontal explanation.

Instead, it is important to apply teaching forms that involve students, stimulate their participation and interest through digital technology [17]. On one hand, active teaching methodologies put students at the center of the learning process, considering them as protagonists of their education paths; on the other hand, they attribute responsibility

to them and stimulate their autonomy [18, 19]. This teaching methodology is particularly important for students who are more difficult to reach and at greater risk of early school leaving. In fact, to support vulnerable students, it is essential to work on their involvement, on motivation; it means thinking about tasks that are meaningful to them and making them active participants [20].

Active learning requires students to reflect on the activity carried out and to build meanings, which are then shared with the group. Therefore, planning, self-regulation and critical thinking skills are stimulated [21]. Students are asked to draw on the conceptual knowledge possessed to face the assigned task; they have then to activate strategies for reflection and reformulation of their perspective on the activity, to give meaning to the experience and connect it with previous ones. This methodology requires a precise design of the activity, of the tools used and of the materials proposed.

The teaching strategies must therefore be rethought and individuated those that can create the best conditions in the DL, to make the young participants active in their own learning experience. Digital resources, if carefully designed, can provide valid learning supports and can reduce the cognitive load required, stimulate motivation and perseverance.

3.4 Distance Learning and Cooperative Learning

In cooperative learning, which is a student-centered approach, students must take an active role in learning together or in groups. Cooperation, which is a crucial competency in both school and life, can be taught to students by starting early in school and sustaining this modus operandi throughout the years [22]. In Cooperative learning, participants work together, exchange thoughts, develop a shared understanding of certain topics and co-construct knowledge. [23]. In Cooperative learning all learners are stakeholders and learning take place through collective discourse [24]. Doing cooperative learning is not just about discussing and sharing knowledge but can enable students to build together new knowledge and strengthen different skills via online collaboration [25]. Cooperative learning in online learning normally deemed a value. Cooperative learning can enhance interaction among students and teachers and generate a sense of social presence [26]. This sense of social presence can be very helpful in coping with students' loneliness when they cannot have direct interpersonal contact. This can be a really very important aspect during times of stress, such as, for example, during isolation due to the COVID-19 pandemic. In addition, this sense of social presence helps students improve their learning and their ability to adapt to different teaching methodologies, which in turn is helpful in helping them understand the complexities involved in teaching and improve their motivation and satisfaction in school [27]. Several studies have been conducted on participants' satisfaction from the cooperative experiences [23]. These studies have found that the key factors influencing participants' satisfaction with cooperative experiences are group members' acquaintance with other students participating in the experience, teacher support and feedback, and trustworthy and user-friendly technology [23]. On the other side, the principal source of frustration seems to be the ability to maintain group participation [28]. Cooperative learning can ease the creation of a more practice-based learning environment for students, which permits participants to learn from their classmates, tutors, and on their own. To implement successful Cooperative learning, it

is vital to appropriately organize the activities of teaching and learning [29]. Teachers need to remember that cooperation is not something innate. Teachers must stimulate cooperation within the group of students. Teaching cooperation means emphasizing individual and collective actions that are to be put into practice from time to time. In cooperative learning, students' content knowledge is fostered by interactions with other students and teachers.

3.5 Foreign Students and Languages Barriers

The DL has highlighted a series of critical issues in reaching and involving students with a migratory background and has accentuated some difficulties that were already present in the pre-covid era. Factors such as language barriers, disadvantaged socio-cultural contexts, limited digital resources available, have made it much more difficult for teachers to reach this segment of the student population [30, 31]. The difficulties have therefore been accentuated by DL, which has radically changed: the learning space that has been switch from physical to digital; the methods of interaction and connection; the temporal structure of teaching. Maintaining the relationship between teacher and students and between peers has certainly represented a big challenge in DL, especially for the most difficult to reach students. Surely the sudden transition to DL had a strong impact on the literacy processes and on the language skills of students with a migrant background, who entered the school system with poor skills in the language spoken at school. This effect was particularly significant for those students who do not speak the language of instruction at home.

One of the aspects that negatively affected language skills during the DL was precisely the lack of social interactions that can stimulate the communicative and relational aspects. Especially in the first phase of the pandemic, a lot of teaching was provided through reading and writing tasks, to the detriment of listening and speaking competences [30].

A reduction in the opportunities of listening and speaking the language, is an aspect that negatively affects linguistic competence, with consequences that have been expanded over time in the scholastic pathways of foreign students. A downward spiral, where the initially language barrier poses difficulties for participation, which become more and more profound over time, while the opportunities for interaction and communication diminish.

The students' competencies in "oracy", that is, the ability to use the spoken language effectively in different argumentative contexts, must therefore also be supported during DL. This competence is declined in different repertoires, according to different contexts. The school may allow the experience of using the spoken language for different functions and registers. Platforms for DL offer many options that can facilitate communication and support immigrant students' learning paths in this direction, for example through video conferencing channels, through non-verbal functions and interactive activities [32].

4 Conclusions

The DL in an emergency situation has required that schools and teachers quickly rethink the teaching methods used earlier in face-to-face learning. Teachers therefore clashed

with the need to use digital as a support tool for their activities but also as a vehicle for interacting with their students.

The DL therefore required competences in the use of various skills that perhaps had been little explored before pandemic. The reflection is connected to the definition of "teacher effectiveness", that are those skills that should be possessed by teachers in order to reach, through didactic actions, the set objectives, putting students in the best conditions to learn [33].

The digital approach cannot be reduced to a simple tool for transmitting educational content or as a transposition of the methods usually adopted in face-to-face teaching in an IT environment. The skills to be developed to master DL are certainly broader and more complex: it is necessary to have technical knowledge about the software and digital tools, and to know how to adapt them to a flexible and creative use. Therefore, it is central to design and organize lessons in order to exploit the potential of multimedia and produce digital content that can then be shared and co-constructed [34, 35]. These skills should be applied in order to support the learning paths of all students through digital tool, with particular attention to the most vulnerable situations. It is therefore a question of using technology to facilitate the acquisition of knowledge and skills in order to ensure a real inclusion and participation of students in situation of greater fragility.

It is important to understand what difficulties are encountered in DL by teachers, which students are the most difficult to reach, which teaching methodologies tested with the aim of improving participation and collaboration between pupils. Exploring the point of view of teachers starting from their experience during the DL period can also help to better understand the training needs of teachers with respect to the use of DL and identify future direction.

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