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**Cooperative approaches and ICTs for promoting social inclusion at school.
Lessons from a scoping review**

**Approcci cooperativi e TIC per promuovere l'inclusione sociale a scuola.
Lezioni da una scoping review**

di

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Abstract:

Cooperative approaches and technology are recognized as key issues in the contemporary debate on how to promote social inclusion in schools. Within the ongoing EU Project COoPING (Erasmus+ KA210-SCH) the links between them were explored through a scoping review. The ERIC database

¹¹ The article is the result of a joint and collaborative work among the authors who have been involved in the COoPING Project. Chiara Bove is the scientific supervisor of the study, along with Alessandra Mussi who is the coordinator of the Unimib Unit involved in the project. Anna Chinazzi oversaw the collaborative writing and editing of the article and wrote paragraph 2, 3.1 and 4.1.; Alessandra Mussi wrote paragraphs 3, 3.2, 4 and 4.2; Valentina Buffon wrote paragraphs 3.3 and 4.3; Chiara Bove wrote Introduction and Conclusions.

was queried to identify relevant empirical studies published in the last ten years. The study selection process – guided by inclusion and exclusion criteria – led to the inclusion of eight empirical studies. The selected articles were charted, and transversal themes were analyzed and narratively reported. The results show the potential of technology to support cooperation and social inclusion at school. At the same time, it warns about some methodological and theoretical cautions to be aware of when introducing it in didactic and formative activities. The findings informed a co-designed intervention with teachers and educators involved in the project.

Keywords: cooperative approaches; social inclusion; ICT; primary school; middle school.

Abstract:

Gli approcci cooperativi e le tecnologie sono riconosciuti come temi chiave nel dibattito contemporaneo su come promuovere l'inclusione sociale nella scuola. Nell'ambito del progetto europeo COoPING (Erasmus+ KA210-SCH), sono stati esplorati i legami tra questi due aspetti attraverso una scoping review. Il database ERIC è stato interrogato per identificare gli studi empirici rilevanti pubblicati negli ultimi dieci anni. Il processo - guidato da criteri di inclusione ed esclusione – ha portato alla selezione di otto studi empirici. Gli articoli selezionati sono stati riassunti in tabelle e i temi trasversali sono stati analizzati e riportati in forma narrativa. I risultati mostrano le potenzialità della tecnologia nel supportare la cooperazione e l'inclusione sociale a scuola. Allo stesso tempo, sollevano alcune cautele metodologiche e teoriche da tenere presenti quando la si introduce nelle attività didattiche e formative. I risultati hanno orientato un intervento co-progettato con gli insegnanti e gli educatori coinvolti nel progetto.

Keywords: approcci cooperativi; inclusione sociale; TIC; scuola primaria; scuola secondaria

1. Introduction

Social inclusion at school is a widely discussed topic in the scientific literature (Ainscow, 2020; Hernandez-Torrano, Somerton & Helmer, 2020; Nilholm & Göransson, 2017). Defining what inclusion is in a univocal and culturally shared way, and what the strategies to promote it are, is still under debate. Since the publication of the first international document that explicitly invites countries to promote school inclusion, Salamanca Statement (UNESCO, 1994), much has been achieved. Yet, many pupils with disabilities and special needs are still excluded from access to the general education system (European Agency for Special Needs and Inclusive Education, 2020). Notwithstanding the Convention on the Rights of Persons with Disabilities (Art. 24, CRPD, UN, 2006), ratified by most countries (UN, 2016), national policies seem to be far from achieving the right to educational inclusion for all children (i.e., de Bruin, 2019). Cooperative approaches and technology are explored as key elements for inclusive processes at school in many international projects. Among these, the ongoing “*EU Project COoPING-Cooperando affrontiamo i cambiamenti*” (Erasmus+ KA210-SCH)²

² The Project COoPING-Cooperando affrontiamo i cambiamenti (Erasmus+ KA210-SCH) is coordinated by the NGO Pandora Cooperativa Sociale Onlus (Italy). The schools Scoala Gimnaziala "Anton Pann" Craiova (Romania) and Crinkill National School (Ireland) are partners. University of Milano-Bicocca (PI: Prof. C. Bove) is a partner of the project and supervises the cross-cultural exchange between teachers/educators involved in the project.

aims at improving social inclusion processes at school through cooperative approaches and Information and Communication Technologies (ICTs), with a specific focus on students aged 9-12. At the same time, it intends to support the professional development of teachers and educators from the three countries involved in the project: Italy, Ireland and Romania³. Within a design-based research approach (Wang & Hannafin, 2005), a cross-cultural exchange among the partners is promoted to create a bottom-up common conceptual framework and co-design an innovative intervention in the classroom. The project is informed by a literature review under the scoping study framework (Arksey & O’ Malley, 2005; Levact et al., 2010) on the recent international and empirical studies that link together technologies, social inclusion, and cooperative approaches at school. After presenting the different phases of the literature review process, the results are presented both narratively and through the data charting form. Then the transversal focal topics are analyzed and discussed.

2. Methods

A Scoping Review approach (Arksey & O’Malley, 2005; Levac et al., 2010) was chosen to map the recent empirical research, relevant to inform a project on cooperative approaches and technology for promoting social inclusion in the classroom. The scoping study took five months from May 2022 to September 2022 and involved six reviewers and a supervisor. It was based on the framework developed by Arksey and O’Malley (2005) and enhanced by Levac and colleagues (2010). The review explores how and what cooperative approaches and technologies are used, what pedagogical methods underpinned these experiences, and what conceptualizations of cooperation and inclusion are implicitly or explicitly embraced by researchers. As suggested by Levac and colleagues (2010), an effective search strategy for a scoping study should combine a broad research question with a clearly articulated scope of inquiry, set by eligibility criteria, displayed in Figure 1. The Educational Resources Information Centre (ERIC) database was queried for peer-reviewed articles published between January 2013 and August 2022. The keywords "cooperative" AND "school" were combined with a range of potential terms related to inclusion ("inclusion", "diversity", "intercultural"; "multicultural", "SEN").

Criterion	INCLUSION	EXCLUSION
TIME	Last 10 years (2013-2022)	Studies outside this time period
TYPE	Empirical studies Peer reviewed only	Non-empirical studies (literature reviews, theoretical or conceptual studies) or published without peer review
TOPIC	Cooperative approaches for social inclusion at school	Irrelevant, with other conceptual focus or aim
TARGET POPULATION of the intervention	Primary and/or middle school students (~6-13 y.o.).	Other age or category

³ In the policy debate of these three countries, the issues of special educational needs and inclusion play an important role, as they all share the goal of creating an inclusive school, albeit through different standpoints, approaches, and practices.

RESEARCH SAMPLE	Primary and/or middle school students and or/teachers	Other categories
RELEVANCE	Involving technologies	Without the use of technologies
AVAILABILITY	Full text available	Unavailable

Figure 1: Eligibility criteria for the identification of relevant studies.

The keyword-based search yielded 346 results. The screening process led to the exclusion of a total of 338 articles that did not meet the eligibility criteria, therefore eight studies were included in the review. The process of identification of the studies is visually reported in a flow diagram (Figure 2).

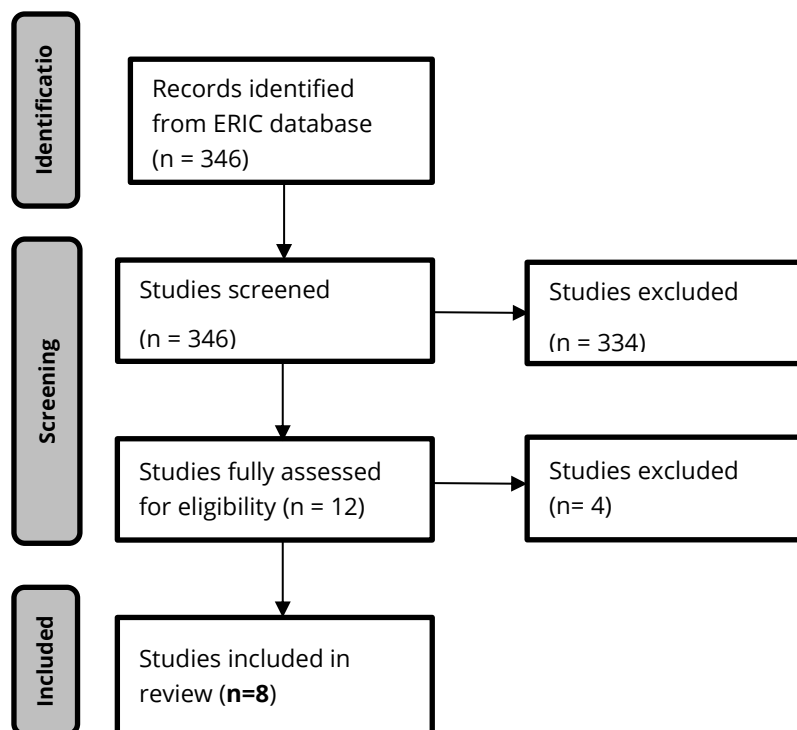


Figure 2 PRISMA flowchart: visual summary of the study selection

The next step was data charting (Arksey & O’Malley, 2005) for the data characterization of each study in a tabular and standardized format. The results and related discussions emerging from the review are presented both narratively. Both the search strategy definition and analytical process were informed by the consultation with a stakeholder⁴, which is a highly suggested step in scoping studies (Levac et al., 2010). The educator (and also coordinator of the COoPING project) was involved in the review team meetings twice. First, in the beginning, in support of the team on the development of the review aims, questions and search strategy; and second, at the end of the review, in sharing and discussing the results. Her involvement had a twofold effect: directly opening a dialogue with an important stakeholder, and – indirectly – having formative effect on the practitioners involved in the

⁴ A. Crespiatico, educator of the NGO Pandora, expert in cooperative methods at school and coordinator of the COoPING Project. The dialogue with her was useful to identify relevant topics and concepts to focus the analysis to make it more meaningful both in a theoretical and practical sense. We would like to thank her as well as all those who contributed to this study.

project. Later, educators and teachers involved in the project, conducted a similar review among international projects from “gray” literature. In doing so, they adopted an “inquire” attitude, which is particularly useful in innovating their work (Dewey, 1929, 1933).

3. Results

The review team developed a standardized form to chart each of the included studies. It served as a common analytical frame to summarize and map the content of the research articles. Each study was summarized and mapped according to the following analytical entries: authors, year and journal, the context of the study, aims or research questions, population and sample, research design and research methods, key findings and main conclusions, teaching approach, and technologies. A streamlined version of the chart is attached (Figure 3). Based on data charting, a narrative analysis of the results is provided.

Authors, year, country	Title	Research aims	Target population of the intervention	Technologies
Eysink, T.; van Dijk, A.; de Jong, T., 2020 (Denmark)	“BE COOL! a digital learning environment to challenge and socially include gifted learners”	“What should a digital learning environment look like, in which gifted learners are socially included in the regular classroom and still being challenged cognitively?” (p. 2384).	Sixth graders of three different ability levels.	Digital learning environment.
Gallardo-Fernández, I. M.; Monsalve Lorente, I. M.; Aguasanta-Regalado, M. E., 2021 (Spain)	“Primary Educational Strategies in Times of Digital Curriculum Content”	“How does the availability of technological resources change the way teachers work? How does the use of technology affect the organization of the Centre and the management of fifth- and sixth-year primary classrooms? How does the use of technology change task planning in primary classrooms? What level of autonomy do students acquire in the learning process?” (p. 70).	Primary school students, 5-6 grades.	Interactive whiteboards, computer classroom and personal devices, digital resources, website, blog, social media accounts, applications for gamification.
Hanghøj, T.; Lieberoth, A.; Misfeldt, M., 2018 (Denmark)	“Can Cooperative Video Games Encourage Social and Motivational Inclusion of At-Risk Students?”	“Can the challenges encountered in cooperative video games encourage classroom inclusion? And can this experience be translated into curriculum engagement?” (p. 775).	190 students, grades 3-6. 32 students had been identified as “at-risk”.	Game-based and gamification.
Ioannou, A. & Constantinou, V., 2018 (Cyprus)	“Embracing Collaboration and Social Perspective Taking Using Interactive Tabletops”	“Provide evidence of the practical utility and impact of tabletop research in a contemporary multicultural classroom and present evidence of collaboration and gains in SPT [Social Prospective Taking] propensity linked to the tabletop-enhanced lessons” (p. 404).	44 students, 5th and 6th grade, with diverse ethnic and cultural backgrounds.	Tabletops.
Phan, T., 2020 (USA)	“Exercises of voice, choice, and collaboration in a personalized learning initiative” (PLI)	“How do PLI students evaluate their collaboration, motivation, and engagement using technology? To what extent does student collaboration impact teaching and learning?” (p 77).	12 environment.	Microsoft Word, Excel, PowerPoint, Prezi, Office 365, Google Slides, Google Slides and Google Docs.
Rickard, A., Grace, A.R.C., Austin, R.S.P. & Smyth, J.M., 2014 (Ireland / Northern Ireland)	“Assessing Impact of ICT Intercultural Work”	“To probe whether it could be shown that [a cross-border school-based exchange program that embeds the use of technology] was having an impact on students’ cultural awareness and their openness to diversity” “To examine whether there were differences in attitude between students who had taken part in the [...] program compared to similar students in the same schools who had not participated” (p. 4)	40.000 students from over 200 school-based projects involved in the program.	Learning environment Moodle and real-time Internet-based video links.
Sormunen, K.; Juuti, K.; Lavonen, J., 2020 (Finland)	“Maker-Centered Project-Based Learning in Inclusive Classes: Supporting Students’ Active Participation with Teacher-Directed Reflective Discussions”	The empirical case study explores the benefits of reflective discussions in supporting student participation in a maker-centered PBL project in supporting student participation	44 primary school students (final year).	OneDrive for digital note-making.
Woodrich, Megan; Fan, Yanan, 2017 (USA)	“Google Docs as a Tool for Collaborative Writing in the Middle School Classroom”	“1. Does anonymous collaborative writing, compared to other modalities, lead to more successful products? 2. Does anonymous collaborative writing equalize participation among students of varying language fluencies? 3. Does anonymous collaborative writing affect student comfort levels?” (p. 393).	97 students from three 8 th grade English Language Arts classrooms, with a high percentage of English Language Learners.	Google Docs.

Figure 3 Data charting (streamlined version)

3.1 Research aims and methodology

The studies included in the review have different research questions and use a variety of research methods to address them. All the studies investigate the links among cooperation, ICTs and inclusion, with different focuses. Some of the studies focus on the student’s academic achievements (Hanghøj et al., 2018; Woodrich & Fan, 2017); others include different aspects such as students’ voice and choice (Phan, 2020), autonomy (Gallardo-Fernández et al., 2021), collaboration (Phan, 2020; Woodrich & Fan, 2017), social inclusion (Eysink et al. 2020; Hanghøj et al., 2018), intercultural

competences (Ioannou & Constantinou, 2018; Rickard et al., 2014), motivation (Hanghøj et al., 2018), comfort (Woodrich & Fan, 2017), participation (Woodrich & Fan, 2017 and Sormunen et al., 2020).

On a methodological level, the review includes three quantitative studies (Iannou & Constantinou, 2018; Rickard et al., 2014; Woodrich & Fan, 2017), three qualitative studies (Eysink et al. 2020; Gallardo-Fernández et. al, 2021; Sormunen et al., 2020) and two mixed methods studies (Hanghøj et al., 2018; Phan, 2020).

3.2 Countries of the study, target population and research sample

All of the selected studies were carried out in the Global North. Two of them were conducted in California (USA) (Phan, 2020; Woodrich & Fan, 2017). Most of the European studies were conducted in Northern Europe: two in Denmark (Eysink et al., 2020; Hanghøj et al., 2018), one in Finland (Sormunen et al., 2020), and one in Ireland and Northern Ireland (Rickard et al., 2014). The remaining two were carried out in Southern Europe: one in Spain (Gallardo-Fernández et al., 2021), and one in Cyprus (Ioannou & Constantinou, 2018).

The included studies presented an intervention or didactic experience with cooperative approaches targeted at primary or middle school students. The ages of 10-12 years old were covered most frequently. Only one of the studies included preschool children (Phan, 2020).

Regarding the research sample of the empirical studies, four of them addressed their research aims by eliciting the perspective of the students involved in the intervention (Ioannou & Constantinou, 2018; Rickard et al., 2014; Sormunen et al., 2020; Woodrich & Fan, 2017). Only one focused on the teachers' point of view (Gallardo-Fernández, 2021), while others chose to combine the perspectives of both students and teachers (Eysink et al., 2020; Hanghøj et al., 2018, Phan, 2020).

3.3 Teaching approaches and technologies

Some of the studies refer explicitly to specific teaching approaches and methodologies, such as Project Based Learning (Sormunen et al., 2020), Ability-adjusted jigsaw method (Eysink et al., 2020), game-based learning and gamification (Hanghøj et al. 2018). Several pedagogical paradigms and principles are mentioned in the articles, such as a social constructivist pedagogy approach (Ioannou & Constantinou, 2018; Rickard et al., 2014), “student-centered approach” (Phan, 2020) or “differentiated instruction” (Eysink et al., 2020; Sormunen et al., 2020) with reference to Tomlinson's work (Tomlinson, 1999).

Different types of ICTs are used in the studies. Among others, Google Docs and Google Classroom, Moodle, Prezi, OneDrive, and Microsoft's cloud, are the most common online services. Microsoft Word, Excel, and PowerPoint are the most used software for peers and teachers' collaboration (Phan, 2020). Some interventions made use of tabletops (Ioannou & Constantinou, 2018) videogames (Hanghøj et al., 2018), a digital learning environment (Eysink et al., 2020; Rickard et al. 2014), and digital note-making (Sormunen et al., 2020).

4. Discussion

The eight empirical studies included in the review were carried out in different contexts with a variety of research methods, resulting in an enriching – albeit partial – overview of the theoretical, epistemological, and practical possibilities of the research on cooperative approaches at school.

It is not self-explanatory what we mean by cooperative approaches or inclusion, especially if we consider studies carried out in different cultural contexts. The analytical reading has been guided by the following review sub-questions: How is the concept of “cooperation” in the classroom formulated in the different cases? What are the elements that emerge when looking at the conceptualization of “inclusion”? What is the relation among cooperation, inclusion and the use of ICTs in the school setting?

4.1 Cooperative approaches

Beyond the widely recognized concept of “cooperative learning” (CL) as an instructional strategy which has been codified in the literature over time (Gillies, 2016), the included studies use a plethora of terms to qualify the activities proposed to students. “Collaboration” and “cooperation” are sometimes used interchangeably which raises the need for a clearer conceptualization of these terms. Authors of the included studies also used “peer learning” (Gallardo-Fernández et al., 2021), “collaborative learning” (Ioannou & Constantinou, 2018) or “collaborative work” (Rickard et al., 2014). All of these approaches are meant as non-individualistic and non-competitive activities to promote students’ socialization and learning.

4.2 Social inclusion

Social inclusion was one of the goals of the cooperative approaches mediated by ICTs presented in the selected papers, but different “categories” of students were associated with it: 1) students with specific learning needs: both special education (Phan, 2020; Sormunen et al., 2020) and gifted students (Eysink et al., 2020); 2) students from diverse backgrounds: in a multicultural classroom (Ioannou & Constantinou, 2018) and contexts historically characterized by tensions (Rickard et al., 2014), or with a specific focus on language background: English language learners (Phan, 2020; Woodrich & Fan, 2017) and reclassified fluent English proficient (Woodrich & Fan, 2017); 3) at-risk students: in a perspective that emphasizes the relational environment in the classroom (Hanghøj et al., 2018) or the socioeconomic status of the families (Phan, 2020); 4) gender-based differentiated students (Gallardo-Fernández et al., 2021).

Inclusive education appears as a broader framework that encourages schools to deal with diversity, perceived as a complex and multifaceted concept. In the contemporary multicultural and global world (Ioannou & Constantinou, 2018; Rickard et al., 2014), representing diversity becomes a pedagogical model addressed to all students. In this way students of “different backgrounds, preferences, interests, learning abilities” (Sormunen et al., 2020, p. 692) have “the opportunity to learn at a level matching their specific needs and abilities” (Eysink et al., 2020, p. 2372). This is all together (Sormunen et al., 2020) and within the social context of regular education (Eysink et al., 2020).

In addition, inclusion is not only about academic development: it also has social and motivational dimensions (Hanghøj et al., 2018). It also works in two ways: students should not only be included but should also acquire inclusion competencies, such as developing “social perspective-taking

propensity” (Ioannou & Constantinou, 2018) or learning “values of respect, tolerance and openness to cultural diversity” (Rickard et al., 2014, p. 1).

The aim is to reduce inequalities inside the school – making a concrete effort to offer equal learning and social development opportunities for all – and outside school – to educate future generations.

4.3 Technologies and didactic choices

In the selected studies, ICTs are integrated into the didactic activities to foster teamwork and collaboration (Sormunen et al. 2020) among students and among teachers (Gallardo-Fernández et. al, 2021; Phan, 2020). Indeed, it is not possible to argue that the use of technology inherently has positive effects on students’ learning (Hanghøj et al. 2018; Woodrich & Fan, 2017). It must be framed within a pedagogical approach that puts students at the center and differentiates the learning activities (Tomlinson, 1999) while allowing them to work and learn interdependently (Phan, 2020). In doing so, mixed groups of students are set up to cooperate. Teachers play a crucial role in guiding them, promoting participation and soliciting reflections (Eysink et al., 2020; Ioannou & Constantinou, 2018; Sormunen et al. 2020). The cooperative activities are carried out within curricular subjects (Hanghøj et al., 2018; Ioannou & Constantinou, 2018; Woodrich & Fan, 2017), intertwined with them (Rickard et al., 2014) or framed within interdisciplinary projects (Sormunen et al., 2020).

In this perspective, technologies can contribute not only to improving students’ academic learning, but also their social and intercultural development and acquisition of digital skills (Rickard et al., 2014; Phan, 2020) thanks to their help in fostering autonomy, participation and motivation (Gallardo-Fernández et. al, 2021; Phan, 2020; Woodrich & Fan, 2017). Digital tools (interactive whiteboards, computers and other devices, digital resources, etc.) can also support teachers in becoming “companion in the learning process” (Gallardo-Fernández et. al, 2021, p. 77) and their own collaboration in planning and managing innovative and interdisciplinary activities. So in-service training that involves digital literacy (Hanghøj et al. 2018; Eysink et al. 2020) is a key component of teachers’ professional development.

5. Conclusions

Online technology has become an integral part of our daily life. Educators, policymakers, and teachers are tasked to understand how technology can be used in a beneficial way to boost student motivation and participation at all levels (Woodrich & Fan, 2014).

This scoping review intends to contribute to the international scientific debate and give advice to educational practices and policies taking stock of the potential of technology in supporting cooperation and social inclusion at school. Simultaneously, it can act as a warning on some methodological and theoretical cautions to be aware of, when introduced in the didactic and formative activities.

Some limitations of our study can provide insights for further reviews. A potential improvement could be to include non-empirical articles. The focus on empirical studies was useful to effectively address the review questions and inform the design of a teaching intervention for the COoPING Project in which the review is framed. Still, the complexity of the conceptualizations that emerged from the review, and the lack of explicit references to the theoretical conceptual framework of the studies, call for further reviews, which would include theoretical studies. In addition, since cooperation,

collaboration and inclusion are culturally situated concepts, further reviews could include studies carried out in non-Western contexts, opening the debate to other cultural standpoints.

Although we are aware of its limitations, the review has effectively informed the ongoing co-design of innovative teaching activities across the three schools involved in the project by interlacing the insights from the literature with bottom-up ideas of teachers and educators. In particular, the review made the case for a complex conceptualization of social inclusion, linked to a wide interpretation of diversity. It also suggests a focus on the use of ICTs in a social constructivist pedagogy and cooperative learning approach, the need to connect all activities with the curriculum and with students' social and civic learning; and a student-centered approach with strong attention to teacher/educator's role and professional development.

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