

Quality of school inclusion and digital technologies: A pilot study

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Abstract

The quality of school inclusion of children with disabilities is a complex construct that emerges from the interaction between individual needs and different systems and processes; therefore, it needs to be investigated through a multi-method approach, using tools capable of grasping its complexity.

The general goal of the study is to describe and test the modified version of two instruments: ICP and SELFIE. The ICP (the Inclusive Classroom Profile; Soukakou, 2016) is an observational tool aimed at measuring and quantifying school inclusion quality through the observation of the teachers' daily practices and the analysis of the school's policy. For the present research, the ICP was adapted to the Italian school context. Moreover, other minor changes were applied to adapt the tool to the primary and secondary levels of education. The SELFIE (Self-reflection on Effective Learning by Fostering Innovation through Educational Technology; European Commission, 2018) analyses the use of digital technologies in the school context. Originally developed as a self-evaluation questionnaire, for the present study it has been transformed into a guided interview, allowing the research team to collect more comprehensive quantitative data.

The tools were tested in a pilot study involving a kindergarten and a 3rd-grade class in the municipality of Genoa.

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Results outline the strengths and weaknesses of the modified versions of the instruments and further changes are proposed. Furthermore, the SELFIE interviews content analysis highlights valuable insights regarding kindergarten and primary school teachers' use of digital technologies.

Keywords: School, educational survey tools, school inclusion, new technologies

Introduction

This paper presents the first results of a pilot study, part of broader research on the quality of school inclusion, aimed at verifying the suitability of two instruments in the Italian context: an observational tool designed in the British context to analyse various aspects of classrooms' inclusiveness (the Inclusive Classroom Profile: ICP by Soukakou, 2016) and a self-assessment tool (SELFIE: Self-reflection on Effective Learning by Fostering Innovation through Educational Technology), born from the initiative of the European Commission with the intention of allowing the entire school community to understand how digital technologies are used for the purposes of teaching and learning.

In Italy, the school inclusion of children with disabilities has been a matter of fact for more than five decades. However, it is widely accepted that the quality of school inclusion varies in relation to cultural, environmental, psychosocial, and personal factors (Maciver et al., 2019; Nilholm, 2021; Zanobini et al., 2024). Many aspects, including school organization and policies (Vlachou, 2004), physical environment, attitudes of teachers and peers, degree of cooperation inside and outside the school, teaching strategies, etc., can contribute to the full realization of an inclusive education model. The physical environment can be evaluated in terms of accessibility and suitability for physical activities, but it can also constitute a barrier for the learning and participation of children with disabilities, especially those with physical or sensory disabilities (Ackah-Jnr & Danso, 2017). Furthermore, the success of inclusive education is usually conditioned by teachers' attitudes and their ability to adapt teaching strategies to foster each student's participation and learning: a recent meta-analysis showed that teachers' attitudes towards inclusion have improved over the years thanks to the emergence of increasingly inclusive policies and that cultural variables can significantly influence such attitudes (Steen & Wilson, 2020). Studies on the importance of cooperation for inclusion have mainly considered

collaboration between regular and special education teachers, but cooperation with professionals outside the school and parents has also been outlined as a key factor for the implementation of inclusion (Kaldi et al., 2018). Furthermore, the application of technological devices can facilitate the inclusion of children with disabilities, specific learning disorders (SLDs), or other conditions determining the presence of special educational needs (SENs) in terms of participation, learning, and wellbeing (Cheung and Slavin, 2013; Fage et al., 2018; Panesi et al., 2020; Parsons et al., 2020).

To date, studies analysing the quality of school inclusion usually use self-report research tools selectively focused on single aspects. For example, a large body of literature focuses on the attitudes and perceptions of different actors, particularly teachers (Heyder et al., 2020; Kiel et al., 2020), peers (Laws & Kelly, 2005; Woodgate et al., 2019; Zanobini & Viterbori, 2022), and parents (deBoer et al., 2010; de Boer & Munde, 2015; Zanobini et al., 2018). More qualitatively oriented research uses case studies, interviews, or focus groups to analyse teachers' opinions (Glazzard, 2011) or the effects of a given condition on the achievement of educational objectives or on the well-being and satisfaction of end users.

In contrast, our project analyses different dimensions of school inclusion quality. Moreover, it considers both data acquired through self-report tools (*Quality Scale of Inclusive School Development-short form - QU!S-S*, Schurig et al., 2020; *Professional Self-Efficacy*, PSE, Nota, Santilli, and Soresi 2015; *Multidimensional Attitudes toward Inclusive Education Scale*, MATIES, Mahat, 2008), administered online to kindergarten, primary and lower secondary school teachers and data acquired through direct observations (selected parts of the ICP) and teachers' interviews (selected parts of SELFIE).

Previous results of a study aimed at testing the psychometric properties of the Italian version of the Qu!S-S, confirmed the validity of this multidimensional self-report tool for the evaluation of school inclusion quality and its association with measures of teachers attitudes and self-efficacy collected online (see Zanobini et al., 2024).

In this article we focused on the description of the last two data collection methods (observation and interview) and on the first results of a pilot study, which represents a very first step towards the adaptation of the ICP to the Italian context and a first verification of the suitability of an interview version of SELFIE.

The ICP (Soukakou, 2016) is an observational tool aimed at studying various aspects related to the inclusion of preschool children with disabilities, developmental disorders, or special educational needs. The

original version has been created and validated in the British context (Soukakou, 2012) and used in other countries, i.e. Greece, to analyse the quality of inclusion at the preschool level (Fyssa and Vlachou, 2015). We have chosen, translated and reviewed some parts of the tool with the aim of adapting them to the Italian context and to the primary and lower secondary school levels (see the Methods section for further details). As highlighted by Soukakou and Sylva (2010), measuring concepts such as “classroom quality” represents a challenge, both because it is difficult to establish which domains are included in the construct and because of the methodological issues related to creating an objective measure of them. The choice of an observational measure structured through situation-specific rating scales allows us to evaluate to what extent situations, conditions or behaviours of interest occur.

The SELFIE was created in the European context, translated into 32 languages, and validated by evaluating its reliability and construct validity with a large sample of school leaders and teachers from 33 different countries, including Italy (Costa et al., 2021). Selected parts of the tool were used in the Italian context to analyse the role of educational technologies in supporting the school community and promoting the wellbeing and inclusion of students (Panesi et al., 2020). We selected only some parts of the SELFIE, in accordance with the research aims and the new administration procedure, through interviews rather than self-report assessments (see the Methods section for further details); in particular, we chose the areas most directly linked to the possible use of technologies to promote school inclusion.

This contribution aims to provide some preliminary information on the possible use of the modified versions of ICP and Selfie in the description of the practical ways to implement school inclusion and of the actual use of technologies in schools. In particular, we intended:

- Verify the suitability of the ICP for the Italian context and for primary and lower secondary schools, taking into account the differences between school levels in the planning of activities and in teachers’ strategies with children of different age groups.
- Verify the adequacy of using structured interview in administering the Selfie and the quality of the additional information thus obtained; moreover, evaluate the suitability of its application to nursery school teachers.
- Discuss some preliminary results obtained from the interviews collected in the pilot study to highlight possible areas of interest related to the teachers perception of technology usage in schools.

Methods

Ethics Committee approval

The research project was submitted to the Comitato Etico di Ateneo - CERA (University Ethics Committee) of the University of Genoa; the Committee examined the objectives, method of the research, and the documentation for the participants: informed consent and privacy policy forms. The ethics committee approved the project and the documentation on 16-3-2023 (N: 2023/16).

Participants

The pilot study involved a kindergarten class and a third-grade class of a comprehensive school (including preschool, primary and lower secondary school) in the main town of Genoa. During the observation in the kindergarten class, a total of 13 children were present, while in the third-grade class, there were 16 children. The kindergarten class included a girl with a motor disability, and the third-grade class included a boy with an autism spectrum disorder. Furthermore, the study involved 6 teachers and the school principal. Teachers' age ranged between 25 and 58.

Data collection procedure

The first contact with participants took place in an online meeting during which researchers explained the aims and procedure of the study to the teachers of the classes that volunteered to be part of the pilot sample. All the participants (teachers of the involved classes and the school leader) and children's parents signed the informed consent and privacy policy forms approved by the CERA. Appointments for conducting observations and semistructured interviews were scheduled with the teachers.

The observations within the classes participating in the project were carried out by two independent, non-participant researchers, filling the grid provided by the ICP. They lasted approximately two hours, and two teachers were present in each class during the observation: the class teacher and the support teacher. Teachers were asked to carry on with the usual class routine, and the observation could include every moment of usual school life (e.g., frontal lessons, group activities, break time, lunch in the canteen). With the prior consent of the school leader and parents, the school personnel provided the researchers the anonymized version of children's individual educational plans and other school documentation, as required by the ICP. Other school documents containing important information for the ICP procedure were downloaded from the school website by the researchers: the PTOF (Triennial Plan of the Training

Offer), the PAI (Individualized Care Plan) and the Institute Regulations, in order to verify whether the school provides a written document concerning inclusion policy and written procedures for school-family communications. Moreover, data collected with the observations were integrated by additional information gathered through specific questions to teachers in the form of an interview, as specified by the original instrument. Teachers were asked for additional information regarding students' learning monitoring, teacher-family communication practises, and information regarding the Individualised Educational Plans (PEI).

Guided interviews pertaining to both the ICP and SELFIE were then conducted with the four teachers involved in the observations, while the school principal and two additional teachers of the same classes participated only in the SELFIE-guided interview. Each complete interview (ICP and SELFIE) lasted approximately one hour, while the SELFIE-guided interview lasted approximately 40 minutes. Participants' answers were recorded and transcribed with speech-to-text software and then checked manually. Moreover, participants were asked to provide a rating on a 5-point Likert scale for each item on the SELFIE.

Instruments

Inclusive Classroom Profile

The inclusive classroom profile aims at assessing the quality of inclusion by analysing the everyday class routine of pupils with an identified disability (Soukakou, 2016). Originally consisting of 12 items, for the purposes of our study, we chose to focus on 6 items: Adaptation of spaces, material and equipment; Membership; Support for communication; Adaptation of group activities; Family-professional partnerships; and Monitoring children's learning (see Appendix 1 for the description of the selected items). We decided not to observe: those aspects typically inherent to kindergarten only, (i.e., *Adult guidance of children's free-choice activities and play* and *Transitions Between Activities*); aspects directly investigating the relationship between teachers and children (i.e. *Relationships Between Adults and Children* and *Adult involvement in peer interactions*) because they are more susceptible to subjective judgment by the observer and at risk of creating resistance in teachers; aspects that are not so central to the topic of inclusion (i.e. *Conflict resolution* and *Feedback*). Each item is rated on a 7-point Likert scale, where a rating of 1 reflects the presence of practices that significantly undermine inclusive education, and a rating of 7 represents highly inclusive and supportive practices. The score for each item is determined by the presence of a set of indicators provided by the

tool's grid; furthermore, for each indicator, the ICP provides examples of the target practices, behaviours, or interactions that the observers should focus on. These indicators must be assessed through three different procedures: a 2-hour classroom observation, a brief teacher interview, and a review of school documentation. The researchers after obtaining the information in the described ways score each indicator. The total ICP score is represented by the mean of the scores of all items.

Regarding the part of ICP interview, the aim of the questions is to assess the application of practices, activities and procedures aimed at fostering the inclusion of children in school life (Table 1). The scores of single indicators and items assessed through the interview are quantitative data that are embedded into the ICP global scores; therefore, no qualitative analysis of the content is required by the ICP scoring procedure or needed for testing purposes.

Tab. 1 – *Examples of ICP interview questions organized by each item*

Item	Examples of the interview indicators
Membership	<ol style="list-style-type: none"> 1. Do children in the classroom have equal opportunities to assume the role as helper of the day? 2. How do you make decisions about children's work and photos that are displayed in class?
Family-professional partnerships	<ol style="list-style-type: none"> 1. "Do you have any written policies/procedures for communicating with families?" 2. "How do you encourage family participation in parent-teacher meetings?"
Monitoring children's learning	<ol style="list-style-type: none"> 1. "How do you monitor children's progress on various learning and developmental goals?" 2 "How often do you monitor children's progress on various goals?"

In the original tool, the analysis of the documentation requires reviewing the children's Individualized Education Program and other school documents that outline the school's guidelines and educational policies such as PTOF (Triennial plan of Education Offer). The documentation review takes into account the personalization, accessibility and inclusiveness of the school documents. For example, the indicators under the item "Monitoring children's learning" take into consideration the frequency of updating the documents, the intelligibility of their contents and the involvement of the family and professionals in

the drafting process. The PTOF is key document to gather information about family-teachers communication guidelines and the general pedagogical framework of the school.

The results of the present study concern, in particular, the adjustments and modifications applied to the ICP to fit the Italian context and the primary and middle school contexts. A detailed description of the changes applied to the tool is reported in the following section. The purpose of the present pilot research is not to analyse the quantitative data, such as the ICP's total scores.

ICP Adaptations

We modified the ICP following two different aims: adapting the scale to the Italian context and to the primary and middle school levels of education.

Regarding the adaptation to the Italian context, one important set of changes concerns the terminology that refers to school documentation. The Individualized Education Program (IEP) is a document used in the education system of the United Kingdom (DfES, Department for Education and Skills, 2001) and other English-speaking countries, such as the USA (IDEA, Individuals with Disabilities Education Act, 2006), for eligible students with disabilities, specific learning disorders or other special needs. In the Italian educational system, two different documents can be considered the equivalents of the IEP, which are the “Piano Educativo Individualizzato - PEI” (Individualized Educational Plan) and the “Piano Didattico Personalizzato - PDP” (Customized Learning Plan). The PEI addresses the special educational needs of students with disabilities such as intellectual disability, autism, and sensory or motor disabilities. The PEI, like the IEP, defines educational goals, strategies and the assessment of children's progress; it also outlines possible major adaptations to lessons, activities and contents (Ianes & Cramerotti, 2009; Inter-ministerial Decree no.182 of December 29th, 2020; Ianes, et al., 2021). The PDP is a document that addresses students with specific learning disabilities and other special educational needs, such as emotional or behavioural disorders or difficulties, sociocultural disadvantages and linguistic differences (Fogarolo, 2014). Both the PEI and PDP must be developed by professionals and families. In our version of the ICP, we used the PEI and PDP as an equivalent of the IEP; in particular, these changes concerned the Monitoring children's learning item.

Another important document in Italian school legislation is the “Piano Triennale dell'Offerta Formativa” (Educational Three-year Plan). The PTOF is mandatory, and every Italian school is expected to develop and

publish it on the school website. This document is developed by the school leader and the teachers' team, outlining the school's goals and strategies aimed at achieving learning and pedagogical outcomes. For example, the PTOF describes specific projects implemented by the school to improve students' performance in one or more specific subjects, collaboration projects with local associations or organizations, and indications regarding updates and meetings with families (Law 107, 2015; Ianes & Cramerotti, 2016). Furthermore, the PTOF contains the Piano Annuale dell'Inclusione (PAI, Inclusion Annual Plan). This document aims to define objectives and actions to improve the quality of inclusion within the school (Directive of December 27th, 2012; Ministerial Circular no. 8 of March 6th, 2013; Ianes & Cramerotti, 2016). Some important information regarding the item Family-professional partnerships can be found in the PTOF and PAI.

The ICP was originally developed for kindergarten programs (Soukakou, 2016); for the present research, we adapted this instrument to the primary and middle school levels of education.

In this regard, no changes to the item and indicator's structure or scoring system were necessary. The practices targeted by the kindergarten and primary/middle school observation grid are the same; nevertheless, modifications were applied to the examples of behaviours or interactions provided by the grid. For example, the content of indicator 7.1 of the Adaptation of spaces, material and equipment item is the following: "Adults intentionally organize the physical space and materials throughout the day to accommodate individual needs and encourage peer interaction". The kindergarten grid provides the following example of the target practice: "Adult clear toys from floor space to support easy access to a particular child". In the primary/middle school version, the previous example was changed as follows: "Adults move materials, objects, or pieces of furniture to support easy access to a particular child". The rationale behind this change is that toys are not common in the classrooms, especially in middle school, so the same example applied to the middle school environment may be misleading. Therefore, toys have been substituted with other things or objects, more common in a middle or primary context, that a teacher may need to clear to ease the access to classroom spaces.

A comprehensive list of the changes applied to the examples reported by the indicators is available in Appendix 3.

SELFIE

The SELFIE (Self-reflection on Effective Learning by Fostering Innovation through Educational Technology) is a self-assessment tool created in the context of the Digital Education Action Plan of the European Commission (2018) to measure the implementation of digital and innovative practices in the school system. SELFIE is a tool freely available online that schools can use to assess the level of application of digital technologies in teaching and learning practices. Different versions of SELFIE were developed for school leaders, teachers and students and for different school levels: primary, middle, high school and vocational schools; also, SELFIE is used in research on the application of digital technology in school systems at the European level (Bocconi et al., 2020; Panesi et al., 2020; Costa et al., 2021; Castaño Muñoz et al., 2022). The questionnaire requires participants to rate the items on a 5-point Likert scale, from 1 = strongly disagree to 5 = definitely agree.

For the purpose of the current research, we selected the following areas of interest: Collaboration & Networking; Infrastructure and Equipment; Continuing Professional Development; Teaching and Learning Part 1; and Assessment practices (see Appendix 2 for the description of the selected items).

There is a teachers' and school leaders' version of the SELFIE questionnaire. The items' content is the same in all areas of the two versions, except Area 3 – Continuing Professional Development; in this area, the teachers' version contains additional items regarding teachers' training activities. For a detailed description of the differences between the two versions and of the SELFIE questionnaire in general, refer to the SELFIE website (https://ec.europa.eu/education/schools-go-digital_en).

For the purpose of the present investigation, the SELFIE questionnaire was modified and transformed into a guided interview to collect qualitative data about teachers' motivations and environmental conditions regarding the implementation of educational technologies; nevertheless, teachers and principals were asked to provide quantitative judgements using a 5-point Likert scale see the Methods section for further details. For the purpose of this paper, we report only the qualitative results. The detailed description and the rationale of the modifications are reported in the following section.

SELFIE Adaptations

For the purpose of the current research, modifications to the SELFIE questionnaire were applied. Primarily, we used the SELFIE questionnaire items to create a guided interview for teachers and school leaders of kindergarten, primary and middle schools. In general, through the interview method, it is possible to:

- collect a greater amount of qualitative information than the questionnaire method, allowing a more in-depth knowledge of the perception of teachers and principals of the use of digital technologies in their schools;
- avoid misinterpretations and misunderstandings of the questions' contents.

Since every item has been modified, it is not possible to report an exhaustive list of all the changes. Nevertheless, it is possible to group all modifications into 4 categories:

- changes applied to transform the questionnaire statements into questions;
- changes applied to the item content to better define the question's target topic and the criteria by which respondents were asked to answer;
- additional information was included in the interviewer form in case the interviewee misinterpreted or did not fully understand the question;
- optional probing questions were added to the interviewer form if the spontaneous response of the interviewee did not provide the target information.

The changes are summarized in Appendix 4, which shows an example item of the teachers' version for each modification category. The same types of modifications were applied to the school leaders' version of the interview.

As previously mentioned, a specific version of the SELFIE questionnaire for kindergarten is not available; therefore, one aim of the pilot study is to test the SELFIE-guided interview at this educational level.

Results

Outcomes from the ICP observations and interviews

The general procedure required by the ICP took place without any critical issues. Regarding the observation phase, no significant problems emerged: after a short presentation by the observers, the children became

familiar with their presence, and no important or overt changes in the classroom routine were observed or reported by the teachers. Regarding the interview phase, we chose to individually interview all the teachers present during the observation, two teachers from the 3rd grade class and two from the kindergarten class.

Specific issues emerged in the adaptation of the ICP to the legislation of the Italian school context and in the adaptation to the primary school level of education.

Issues in the area of Italian legislation emerged in the item Monitoring Children's Learning, indicator 1.1; this indicator requires the use of research-based screening tools to assess possible children's learning and developmental risks. Only one primary school teacher reported that the screening process is outsourced to external centres specialized in learning disorders, which carried out the screening using standardized tools. A teacher reported that the school does not carry out any type of screening, and the other interviewees reported that they carry out an evaluation of children based on observational grids designed by the teacher's team. For the Italian school system, the legislation states that schools are expected to implement measures to identify children's learning difficulties; however, it does not explicitly require the screening process to be performed with standardized or research-based tools (170 Law, 2010). Indicator 1.1 is critical in the ICP scoring process because if its requirements are not met, observers must assign to the Monitor Children's Learning item the lowest score; in this way, it is possible that this item may generate systematically low scores if applied to the Italian school context. One possible solution is to modify the content of the indicator in such a way that the lowest score is applied if the school does not carry out any type of observation aimed at targeting possible developmental risks.

Another issue regards the adaptation to the primary and middle school level of education. The item Support for Communication reports some strategies and practices to foster children's linguistic competence: repetition of important words during conversations, modelling of elements of expressive language or social interaction (e.g., "how to ask for help"), descriptive commenting on what the child is doing (e.g., "You are painting with so many colours!"), expanding the child's verbal communication (e.g., The child says "doggie", and the adult expands "Yes, that is a big brown doggie"), and asking open-ended questions. In the context of an early childhood classroom, the previously mentioned strategies can be applied to the entire group of children. In the case of primary and lower secondary school, such adjustments are necessary only in the case of a child with severe language and/or communication

impairment. If there were no children with such difficulties in the classroom, these adaptations and strategies would not be necessary, and their absence would not represent an obstacle to inclusion. An alternative approach would be to allow observers to assess this item as 'not applicable' if the observed children do not require any assistance at all in the area of language and communication. Children's need for support can be assessed through observation and information provided by the PEI (in the Italian context, the PEI is required to report clinical information such as diagnosis and information about children's functioning in the school context).

A minor issue emerged in indicator 3.3 of the Membership item: "Many books, materials, and pictures displayed in class describe and reflect individual differences in a positive way". The researchers did not observe the requested material in any of the classes involved. In the ICP interview part, however, teachers reported that this type of material is available but simply not displayed; they usually use it in activities or games aimed at promoting inclusion and belonging. It is possible that displaying this kind of material in the classrooms might be an uncommon practice among teachers; nevertheless, the pilot sample is too narrow to outline any conclusion about this topic.

Another issue regards the ICP interview part; as mentioned above, interviews were carried out with both teachers who were in class during the observation. In indicators 1.1 and 5.3 of the Monitor Children Learning item and 7.1 of the Membership item, teachers' responses were contradictory; this highlights the importance of confirming the interviewee's statements by examining documentation or another source of information when the interviewee is uncertain or his or her answers are unclear.

Outcome from the SELFIE interviews

Since the items of the interview were open questions, participants were allowed to produce complex and extended answers; therefore, a categorization of participants' answer content was necessary. Because the sample is limited, a paper-and-pencil method was used to analyse the content of the interviews. The most relevant and frequent topics for each interview area were selected, and the corresponding labels summarizing the answers produced by the participants were applied. The chosen labels divided by area are reported and described in Appendix 5.

Network collaborations and interactions

The interview contents outline that the collaboration regarding the support of **the use of new technologies** is mainly internal to the school, while not all teachers consider the discussion on new technologies between institutes and external bodies to be a widespread and consolidated procedure.

Participants reported examples of formal and informal **internal** opportunities during which they were able to share successful experiences of new technology application to teaching practice; E (English version): “For example, we [primary school teachers] and the secondary school both take part in the Coding Unplugged project, which involves other schools of our institute too... However, there’s a lot of collaboration between us [teachers]”; I (Italian version): “Noi [insegnanti della scuola primaria] abbiamo per esempio in comune con la scuola secondaria il Coding Unplugged poi anche con le altre scuole dello stesso istituto comprensivo... Comunque’ c’è tanto ricircolo tra di noi di collaborazione”.

Participants answer that the **monitoring** process of the progress in teaching and learning practices with digital and educational technologies is carried out in an informal way and no official tools are employed; E: “Covid has imposed a change in this [in the use of new technologies]; now there is a continuous exchange of skills and a more widespread use of technologies but there is no formalized monitoring process”; I: “Il covid ha imposto un cambiamento in questo [nell’utilizzo delle nuove tecnologie], ora c’è un continuo scambio di competenze e un utilizzo più diffuso delle tecnologie ma non è previsto un momento di monitoraggio formalizzato”.

Infrastructure and equipment

This area is the one that emerges as least problematic for respondents. All participants reported that thanks to **PNRR funds**, schools are well equipped with both devices within the classroom and internet connection that allows them to use the new technologies successfully; E: “Of course, IWBs are everywhere now; we have interactive screens without a projector; they are in almost all classes, and now with the PNRR this equipment is available in all classes”; I: “Certo, le LIM ormai sono un po’ ovunque, abbiamo gli schermi interattivi senza videoproiettore, sono in quasi tutte le classi e ora con il PNRR completiamo la dotazione in tutte le classi”.

Participants showed satisfaction with the **types** of new technologies available in the school, which is also evident from the previous answer. E: “We have at least one laptop per class. We have fibre optic

connections in all schools, for now it is fibre to the cabinet, FTTC, but we already have inside our schools fibre to the home, let's say, FTTH"; I: *"Abbiamo almeno un portatile per classe. Abbiamo la fibra in tutti i plessi, per adesso è una fibra cabinet, FTTC, ma abbiamo già dentro nelle scuole la fibra che arriva in casa diciamo, FTTH"*.

The devices are functional, updated and meet the learning and teaching needs for all students (**beneficiaries**); E: *"Yes, we have a laptop in each classroom at least [...] thanks to the funding of specific projects of the Ministry of Education aimed at providing schools resources to acquire digital devices for pupils with disabilities"*; I: *"Abbiamo almeno un portatile per classe [...] con i finanziamenti del progetto specifico a livello di ministero per la dotazione dispositivi digitali per gli alunni con disabilità"*.

They are all largely satisfied with the technologies that are used with children with special educational needs. All the teachers said that every year, the requests are met, and the technologies available in the school are functional and efficient.

The school also provides devices that students can take home if requested.

Regarding the **technical assistance** service, all respondents noted a lack of a professional figure within the institute who can support teaching by fixing any device malfunctions. However, there is a technician who is not an internal resource of the institute. Everyone noted a slowness of the intervention that pushes teachers to solve the problem with their own resources; E: *"Because there's a collaborator who sometimes is available, however, I know that if a computer breaks down very often it's quicker to take it to a repair shop yourself"*; I: *"Perché [c'è] un collaboratore che ogni tanto viene però, solitamente se ci si rompe il computer della classe, molto spesso chiedi assistenza, [ma] fai prima a portarlo tu da qualche parte"*.

When asked about **data protection**, many teachers were uncertain whether the school was equipped with some form of data protection tool; E: *"...I don't know if there's this systematic safety thing [data protection] for the whole system...."*; I: *"...non so se c'è questa cosa [la protezione dei dati] sistematica su tutto..."*. The interview content outlined that the school web network is protected by traditional tools, i.e., passwords, firewalls, profanity filter and e-mail filtering.

Regarding the measures introduced by the school to ensure efficient actions derived from blended learning, teachers feel supported not only by colleagues but also by external professionals, such as psychologists. Furthermore, teachers reported that the school has introduced efficient measures to identify students' needs arising from blended learning.

Regarding the **use of personal electronic devices**, there are only a few selected classes where all students can bring their own devices and use them for educational purposes. In other classes, the use of personal devices in class is permitted only if required by the PDP or PEI as a compensatory measure. Furthermore, teachers reported that school spaces are suitable for teaching with digital devices.

Continuous professional development

Regarding continuing professional development, all teachers reported many **possibilities** available for training. The possibilities arise not only from local proposals (municipal projects) or ministerial proposals but also from feedback to the school principal, who uses online forms to collect the training needs of teachers (**how courses are chosen**) E: *“Training courses are often offered. It is the digital animator who requests feedback during meetings or through those famous Google forms...”*; I: *“propongono spesso e volentieri dei corsi di formazione. È l’animatore digitale poi tramite interventi durante le riunioni o tramite quei famosi moduli Google [che] chiede dei feedback...”*.

The proposals are very broad and include courses for the use of new digital technologies that involve tutoring, workshops, and online courses. Other schools, organizations or institutions propose school training events and projects that, in turn, are directed by the head teacher to the teaching staff. In addition, within the institute there are many opportunities to have a debate with colleagues and to learn the use of new technologies; E: *“Yes, [...], for example, today there’s the institute teachers meeting... which is divided into groups; everyone can access the areas of interest, i.e., the Coding group, the Psychomotricity group, and the Library group”*; I: *“Sì, ad esempio oggi fanno l’interclasse che si suddivide in gruppi, ognuno può accedere alle aree di interesse, cioè il gruppo Coding, il gruppo Psicomotricità, il gruppo Biblioteca”*.

Pedagogy: Tools and resources

All participants said they usually look for digital educational resources for teaching (**reasons for search**); E: *“Often. Yes [I look at digital resources], to design and schedule lessons”* I: *“Spesso. Sì [guardo le risorse digitali], per la progettazione per la programmazione anche delle lezioni.”*

The material is often designed to explain a topic in a way that is understandable to all the children in the class and to adapt the lesson to the students’ needs; E: *“I usually look for so much material I don’t even*

use it, but I look for different ways to explain the topic”; I: “Solitamente cerco più materiale che poi magari neanche utilizzo, ma per vedere come l’argomento può essere presentato sotto tante forme”.

The search for digital materials takes place daily, but they are rarely **created from scratch**: E: “Not much, but I’d like more...”; I: “Non molto, ma mi piacerebbe di più...”. In particular, all teachers said that they look for digital material on a daily basis. At the same time, however, all teachers report that they rarely create original material and that, more often, they try to adapt the one they find on the internet. Digital tools are widely **used within the educational institution** to foster collaboration. In this regard, all teachers reported an overuse of digital technologies for **communications** between colleagues and with external users, i.e., parents; E: “[We always use new technologies for school communications] *that is, through the electronic register, through emails, through the... I mean, let’s say it is very effortful...[because we are always available]*”; I: “[Usiamo sempre le nuove tecnologie per le comunicazioni scolastiche], cioè attraverso il registro elettronico, attraverso le mail, attraverso le... Cioè, risulta molto faticoso [perché siamo sempre reperibili]”.

Moreover, teachers in the classroom try to use open-source digital resources.

Evaluation practices

In regard to the assessment of skills using digital technologies, teachers attribute to the word “evaluation” mainly the meaning of “grade”: for this reason, the answers refer to the fact that in kindergarten and primary school, grades are usually not visible on the electronic register.

Games and quizzes are **used** to provide immediate feedback to students on the correctness of their answer; E: “Yes, even quizzes. Children also use them during breacktime as a game, sometimes we use them during the Italian lesson, so they practice more”; I: “Sì, anche quiz. Lo fanno anche in ricreazione per gioco, a volte li mettiamo durante italiano, così si esercitano di più”.

Teachers think that new **technologies** can encourage students to **improve** their learning and their creativity, but this can only happen in higher levels of education. E: “(kindergarten teacher) *We don’t use them much, because I’m speaking personally... I believe that there are other means to encourage students’ creativity, using other tools I mean. Nevertheless, you might use technology as well, but only after the creativity comes out, right? In other words, of course, we take technologies into consideration, but we don’t start from this. We work*

with young children”, I: “[Si fa] poco, cioè perché parlo personalmente... Cioè ritengo che ci siano altri mezzi per incoraggiare la creatività degli studenti. Poi si arriva magari a utilizzare la tecnologia, ma dopo che la creatività è venuta fuori, no? Come dire, non è che non si prenda in considerazione. Eh, però non si parte da questo, no? [lavoriamo] con i bimbi piccoli”.

While in primary school, digital technology is used to stimulate creativity in art teaching lessons; E: “We do it [stimulate creativity with new digital technologies] during art lessons: you can show a picture, a painting and children can copy it”; I: “questo qua lo facciamo [stimolare la creatività con le nuove tecnologie digitali] quando c’è non so arte si può far vedere un quadro, un dipinto e lo possono copiare”.

The support of the use of digital technologies for children’s learning assessment comes mainly from the teachers’ training, and for this reason, it is at the discretion of the teacher whether to be supported or not in this area; E: “The support is definitely there, then it is at your discretion...”; I: “Il supporto c’è sicuramente... poi è a discrezione, a scelta [dell’insegnante]”.

In general, the representation of all teachers is that digital technologies can improve the learning experience of pupils.

Finally, regarding the enhancement of children’s digital skills acquired independently and applied in the school context, there is a difference in the representations of teachers of different levels of education. Kindergarten teachers report that this cannot be done because the children are too young, while the primary school teachers report that often the pupils teach them how to operate a certain device or how to connect it; E: “They are all very competent and often teach us”; I: “Tutti, molto tanto competenti e insegnano a noi”.

The answers to the item that asks whether children are allowed to bring their own devices to school outlines some doubts; E: “Oh no, we can’t do this [we can’t let them use their technologies]... We know that unfortunately they are young, unfortunately they use them badly”; I: “Eh questo no, questo non possiamo farlo [non possiamo fargli usare le loro tecnologie... Sappiamo che purtroppo son piccoli, purtroppo le usano male”.

Discussion and conclusion

The aim of the article was to provide some preliminary information on the possible use of the modified versions of ICP and Selfie in Italian schools.

For what concerns the selected parts of ICP and their modifications, the study considered their suitability in describing the concrete ways to implement school inclusion not only in preschool but also in a primary classroom. For SELFIE, a self-evaluation tool for schools created and validated at European level, we proposed an administration method via guided interview in order to collect qualitative data on the actual use of technologies in schools.

Regarding the ICP, the narrowness of the pilot sample does not allow quantitative conclusions about the scores of the single indicators or items; however, it is possible to outline which elements and contents of the instrument were assessed as effective and suitable for use in the Italian context and primary schools. Minor issues with the item content have been identified and reported in the previous paragraph, and changes are proposed as possible solutions.

Having addressed these concerns, the methods of data collection required by the tool (i.e., observation, interview, and analysis of documents) look promising; the observation indicators can give useful information about behaviours, strategies or elements of the environment to be assessed.

The interview questions required the teacher to report precise information about the school routines and procedures, reducing eventual subjective interpretation. The document review indicators clearly outline which information the documents have to provide and the features of the documents to be assessed. As a result, no differences emerged from the two observers' ratings.

The items used in the research take into account several key elements of the implementation of inclusion: the strategies carried out by teachers in the classroom to improve inclusion (Support for Communication, Membership), the structuring of physical environments (Adaptation of Space, Materials and Equipment) and the school's systematic procedures and national school legislation (Family-Professional Partnership, Monitoring Children's Learning).

Overall, the chosen areas of interest allow researchers to provide a picture of some very important, easily observable aspects of inclusive practices implemented in kindergarten and primary schools that may represent a measure of the actual realization of inclusive practices in school routines.

This feature may be considered crucial from a research perspective. The preliminary results of a systematic review of the literature regarding inclusion in schools carried out by Papotti et al. (2023) reveal that much of the literature on inclusion focuses on the analysis of individual variables measured, especially among teachers, such as attitudes and

beliefs towards inclusion. From the data collected thus far, it seems that there is little research investigating how these individual variables impact the actual implementation of inclusion in classes and school routines. In future research, ICP scores could be employed as an outcome variable to determine which individual variables impact the effective implementation of inclusion in classroom and school procedures.

The SELFIE tool was first transformed into a semistructured interview.

The tool has proven very useful in capturing teachers' representations of the use of new technologies in various areas of school life. In all areas of SELFIE, which were chosen for the purpose of research, the interview proved to be able to grasp the teachers' representations, and the respondents were able to expand their responses by describing in detail their use of new technologies in teaching practice.

In the first area entitled *Network collaboration and interaction*, respondents reported that new technologies have proved useful for fostering collaboration between colleagues, both for communication and for the transmission of skills. All in all, digital technologies are perceived as a crucial tool for implementing teacher teamwork, which can be considered a cornerstone of school practice (Szymkowiak et al., 2021).

In the area of *Infrastructure and equipment*, the interview was useful to grasp the perceptions of teachers. Specifically, all respondents noticed a breakthrough when they had access to PNRR funds. Thanks to these resources, the school was equipped with many new learning technologies, and all students have access to them. The only area considered more critical is technical assistance, judged by all respondents to be very occasional and inefficient. Not receiving technical support could lead teachers to abandon the use of technologies and embrace traditional methods, especially in the case of teachers who perceive themselves as incompetent in the use of new technologies. Regarding the protection of personal data, teachers were not always aware of the data protection tools used in the school digital network even though they were active. Unawareness of the means of data protection could lead to underestimating them and not fully understanding their importance.

In the context of *Continuous professional development*, interviews outlined that teachers are satisfied with the school training offer regarding digital technologies: they reported positive opinions on both the quality and variety of the training proposals. This aspect is also

confirmed by the school principal's interview, who reported that he collected every year teachers' training needs, this year, through ad hoc Google questionnaire where teachers can indicate their training needs.

Through the interviews, it was also possible to understand the teachers' representations of *Pedagogy tools and resources*. On the one hand, teachers stated that they usually looked for digital resources for teaching practice; on the other hand, these resources are not intended to be used by students independently. In this regard, the teachers' belief that clearly emerges from the interview content is that digital tools are considered only a support for learning and that the teaching process cannot be carried out through the exclusive use of digital technologies. Furthermore, although this belief is shared by all the teachers interviewed, the contents of the interviews of the kindergarten teachers highlighted an even more cautious attitude towards the use of digital technologies compared to that of the primary school teachers.

With regard to the overuse of communication technology, perhaps this issue should be taken into account by principals by offering explicit family-teachers communication rules in school regulation documents, in order not to overload teachers even in moments of private life. Moreover, teachers who feel invaded by new technologies could develop a negative attitude towards them. Finally, regarding *Evaluation practices with digital technology*, thanks to the interviews, it was possible to understand how the use of digital tools to assess children's skills is represented as a moment of playful exercise, and consequently, the feedback stemming from it is not considered part of the assessment process.

As mentioned above, SELFIE was applied to kindergarten teachers for the first time; in this regard, no issue arose. SELFIE proved to be an effective tool for gathering opinions, beliefs, and representations of teachers at this level of education, and no item content adaptation was necessary.

In general, starting from these preliminary qualitative analyses, we think that the SELFIE tool, translated into an interview, can be a useful tool to collect this type of data and better understand school complexity.

Given the exploratory nature of this pilot study, further steps are necessary to validate the tools, modified through the selection of items, the adjustments made to adapt them to different school levels and the different methods of administration of the SELFIE. As regards the ICP, the instrument must be validated, as well as through a construct validity analysis of the selected parts, also with a reliability analysis, through the comparison of the quantitative scores with the outcome of a self-report tool, in our project the Italian version of the Qu!S-S. Moreover, it should

be interesting to compare the ICP results with the teachers attitudes toward inclusion and their self-efficacy, in order to understand how behaviour intentions and self-perception can be predictive of observable ways of realizing inclusion.

For what concerns SELFIE, it has been already validated and used as self-evaluation instrument in European and Italian research. The qualitative analysis of our study will be used as a basis for better understanding how teachers already use technology in their classes, also for inclusive purposes, and what their expectations are towards the PNRR RAISE project, within which our research fits. Furthermore, a comparison with measures of teachers' self-efficacy in using technology could provide further information on the suitability of selected parts of the instrument.

However, caution is required interpreting data from this pilot study, because of the very limited sample size. An expansion of the sample and the results of a standardization process will clarify whether the modified tools can be useful for evaluating the concrete results of inclusive processes.

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Appendix

Appendix 1 - List and brief description of the ICP items used in the present research

Item	Description
Adaptation of spaces, material and equipment	It assesses the adaptation carried out by the adults to classrooms' spaces, environment and furniture to improve the accessibility and participation of all pupils. The indicators included in this item take into account the accessibility of classroom areas and materials and the support strategies provided by the teachers to promote the independent use of classroom materials and equipment.
Membership	It assesses the extent to which children are involved in the classroom daily life and routines. The indicators of these items are, for example, the presence of overt bullying behaviours ignored by teachers or the organisation of activities specifically aimed at promoting the understanding of individual differences.
Support for communication	It is aimed at analysing teachers' strategies intended to create opportunities for communication between the target children and their classmates. The indicators of this item consider, for example, the use of communication strategies (e.g. modelling and prompting) aimed at improving language skills and fostering communication with classmates.
Adaptation of group activities	It takes into consideration the strategies carried out by the adults to include and support target children during group activities, for example, by positioning a child with visual impairment in front of the group and supporting his engagement in the activity.
Family-professional partnerships	It assesses the quality of the communication between children's families and the school personnel. The indicators of this item take into account, for example, the written policies and procedures of the school, the opportunity for the families to provide feedback about the school services, and the organization of activities aimed at building and strengthening an inclusive community.
Monitoring children's learning	This item is based, for the most part, on the review of the school documents that define pedagogical objectives, activity planning and the assessment of children's learning outcomes.

Appendix 2 - *List and brief description of SELFIE questionnaire areas used in the present research*

AREA	SELFIE brief description of items' content European Commission, 2018
Collaboration & Networking	This area relates to measures that schools may consider supporting a culture of collaboration and communication for sharing experiences and learn effectively within and beyond the organisational boundaries. (EU Commission, 2018, pag. 5).
Infrastructure and Equipment	This area is about having adequate, reliable and secure infrastructure (such as equipment, software, information resources, internet connection, technical support or physical space). This can enable and facilitate innovative teaching, learning and assessment practices. (EU Commission, 2018, pag. 6).
Continuing Professional Development	This area looks at whether the school facilitates and invests in the continuing professional development (CPD) of its staff at all levels. CPD can support the development and integration of new modes of teaching and learning that harness digital technologies to achieve better learning outcomes. (EU Commission, 2018, pag. 8)
Teaching and Learning Part 1	Using digital technologies for more effective learning and updating and innovating teaching and learning practices. (EU Commission, 2018, pag. 10)
Assessment practices	This area relates to measures that schools may consider to gradually shift the balance from traditional assessment towards a more comprehensive repertoire of practices. This repertoire could include technology-enabled assessment practices that are student-centred, personalised and authentic. (EU Commission, 2018, pag. 12).

Appendix 3 - *List of the adjustments applied to the kindergarten version of the ICP needed to adapt*

Item indicator	Indicator content	Examples - Original version	Examples - Primary and middle school version
Adaptation of spaces, material and equipment Indicator 7.1	Adults intentionally organize the physical space and materials throughout the day to accommodate individual needs and encourage peer interaction	Adult clear toys from floor space to support easy access to a particular child”	“Adults move materials, objects, or pieces of furniture to support easy access to a particular child”.
Membership Indicator 3.1	When adults provide opportunities for children to assume social roles and responsibilities	Helping at a snack time, cleaning up toys after playtime, setting up table for activity	Helping the teacher, tidying up the classroom, setting up table for activity
Membership Indicator 3.4	When children’s photographs or work is displayed in the classroom (e.g.), examples completed by children with and without disabilities are present	e.g. children’s work pictures displayed on the wall, children’s or family photograph albums	e.g. posters, art works, poems
Support for communication Indicator 1.1	Adults ignore children’s attempts to communicate or make no time and effort to understand them	e.g. Adult ignores child’s persistent pointing to a specific toy, child is left crying for a long period of time	e.g. Adult ignores child’s persistent pointing to a specific object, child is left crying or in overt distress for a long period of time
Support for communication Indicator 3.3	Criteria for Rating indicators Score YES if at least one of the following oral strategies is used at least occasionally with the majority of children to encourage them, facilitate, or model language:	Repetition: e.g. adults say to child: “do you hear the doggie? Hear the doggie? Doggie!” Expanding: e.g. child say “doggie” and adult expands, “Yes, that is a big brown doggie” e.g. child points to a cookie saying “cookie” and adult extends with, “this is a cookie	Repetition: e.g. adult say to child: “Can you hear the drum? Listen to the drum! Expanding: e.g. child says “sheef” and adult expands, “Yes, that is a squared sheet” e.g. child points to a notebook saying “notebook” and adult extends with: “this is a notebook”
Adaptation of group activities	Criteria for Rating indicators - introduction	Examples include circle time, storybook reading, group cooking, music and art activities	Examples include group activities, reading, art, musical class activities
Adaptation of group activities	Children are excluded from all planned group activities	e.g. children always pulled out during group	e.g. children always pulled out during

Indicator 1.1		story time, circle time, snack time, and outdoor play	group reading activities, break time, group activities and outdoor activities
Adaptation of group activities 3.2	Adults make effort to encourage child participation, although children might not be consistently or actively engaged for the whole time	e.g. adult models song movements for child	e.g. The adult re-explains the instructions of a group activity individually to a student
Adaptation of group activities 3.3	Children interact in compliance with the overall demands of the group activity	e.g. child attends quietly to a story time	e.g. child attends quietly to a group activity

Appendix 4 - This table summarizes the modification carried out to the Selfie Questionnaire. The column "Type of modification" shows the 4 categories of modification that have been applied to the original version of the Selfie. The "Questionnaire item example" column displays an example of the content of an item of the original questionnaire version; in the "Interview - item example" column the modified item content of the interview version is reported. The "Interview-additional information" and "Interview probing questions" column shows respectively the additional information or question that have been reported on the interviewer form. The Item column reports the code of single items to which a type of modification has been applied.

Modification Category	Questionnaire item example	Interview item example	Interview additional information/ probing questions	Item
1. From statement to question	In our school, physical spaces support teaching and learning with digital technologies	In your school, do physical spaces support teaching and learning with digital technologies?		All
2. Criteria definition	I create digital resources to support my teaching	How often do you create digital resources to support your teaching practice?		C3, C13 C15 C16 E1 E2 E3 E4 E5, G1 G3 G5 G6 G7 G8 G9 G10
3. Optional additional information	In our school, the digital infrastructure supports teaching and learning with digital technologies	Does the digital infrastructure of your school support teaching and learning with digital technologies?	Digital infrastructure refers to the set of digital technologies available in the school for teaching and learning. Ex: internet connection, IWBs or digital equipment for the classroom, digital resources, software...	C1, C7 C14 E5 G1 G3 G5 G6 G8 G9 G10
4. Optional question	In our school, we review our progress in teaching and learning with digital technologies	In your school, do you monitor your progress in teaching and learning practices with digital and educational technologies?	How does the monitoring take place? How often?	B1 B2, B3 B4 C2 C5 C7 C8 C10 C11 C12 C15 C16 D1 D2 D3 G1 G3 G5 G6 G7 G8 G9 G10

Appendix 5 - the areas identified in separate paragraphs are described in each of which the labels of the themes categorized in each area are shown in bold

Network collaborations and interactions

- Internal/external

The school uses digital technologies for internal purposes or to facilitate partnerships with other organizations

- Activities

Areas of collaboration between schools and organizations aimed at supporting the use of digital technologies

- Monitoring

How progress in teaching and learning practices is monitored with digital and educational technologies

Infrastructure and equipment

- PNRR

The way schools managed to find funding to buy digital teaching equipment

- Types

The types of digital equipment for teaching that are present within the institute

- Beneficiaries

Those who use digital technologies for teaching

- Technical assistance

Whether a technician is present within the school and how the digital devices are repaired within the school

- Data protection

Which data protection systems are applied within the school

- Use of your electronic devices

How students use their own devices at school

Continuous professional development

- Possibilities

Digital technology training opportunities for teachers

- How training is chosen

How teachers decide which training courses to attend.

Pedagogy: Tools and resources

- Reasons for search

The reasons why teachers look for online digital resources for teaching

- Creation from scratch

The reasons why teachers create their own digital materials from scratch

- Use within the class

How teachers use new technologies in their daily work

Evaluation practices with digital technology

- Technology in the assessment process

How teachers use the new technologies for the student evaluation process

- Technology that improves

How new technologies are used in teaching practice to improve the learning experience