TEACHER TRAINING BETWEEN INCLUSIVE EDUCATION AND ICT

LA FORMAZIONE INSEGNANTI TRA DIDATTICA INCLUSIVA E ICT

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ABSTRACT

Technology can play an important facilitating role in the school inclusion process by supporting the students in the classroom and increasing the level of understanding.
This paper aims to explore the reasons for this still wide gap and the motivations for not using ICT in the classroom by conducting research with a sample of 115 teachers in training (TFA) using a Mixed Methods approach to investigate the resistance and motivations for this phenomenon.

La tecnologia può svolgere un'importante funzione di facilitatore nel processo d'inclusione scolastica supportando l'alunno nella didattica e aumentando i livelli di comprensione.
Il contributo mira a indagare le ragioni che portano a non utilizzare le TIC nella didattica attraverso una ricerca con un campione di 115 insegnanti in formazione (TFA Sostegno) attraverso un approccio Mixed Method per indagare quali siano le resistenze e le motivazioni di questo fenomeno.

Introduction

Over the past fifty years, changes in the representation of disability have returned to an approach based first and foremost on the recognition of rights, attention to individual growth and the well-being of people with disabilities.

The interpretative paradigm known as the *capability approach* recalls the principles of justice and social equity that guarantee social systems capable of expanding people's *capabilites*, i.e. favouring actions that allow for the realisation of the essential functioning that makes it possible to lead a life considered at least acceptable (Sen, 2000). The right to a life of dignity, advocated by the philosopher Martha Nussbaum (2002), calls into question a problem of social justice that concerns the issue of the inclusion of persons with disabilities and their right to experience all those actions that are the ways of acting, doing and being that constitute human life (Nussbaum, 2002).

This introduction introduces us to the meaning we want to give to the title of this contribution, that is, to ask ourselves how to translate these principles into the educational reality, how to ensure that Information and Communication Technologies (ICTs) enter into the lives of young people with disabilities with the opportunities they offer.

It follows that the school world, and the teachers who are an essential part of it, must be supported in learning how to engage with technologies first. They, in particular, when they are dedicated to supporting students with disabilities, must be trained in an approach that is not only cognitive of ICT and their instructional opportunities, but also conscious of seeing in ICT the inclusive opportunities that arise in the presence of adequate design (Pinelli & Fiorucci, 2020).

1. ICT in supporting teaching/learning processes

Long gone is the time associated with the first experiences with *teacher machines* (Skinner, 1960), programmes based on linear sequences of content units, questions and answers designed to instruct, but also to reinforce and stimulate learning (Skinner, 1960*)*.

The advent of technology in the last 50 years has led to the dissemination of tools through which the new generations have been able to be immersed in technology

even in early childhood. This is a condition that, according to some scholars, can produce different approaches to the use of computer language, to reading texts randomly rather than sequentially, to searching the web for information but also for social relationships (Prensky, 2012; Jenkins, 2010).

An important change in the use of ICT is mainly due to the birth and development of the Web. In the transition from Web 1.0 to Web 2.0, the linear type of navigation becomes circular, allowing users to participate, to be actors in the construction of knowledge, activities, organisation of environments in which to do, relate and learn (Sinini, 2013). New scenarios open up for informal learning, but also for formal learning, which has to introject the innovations that the new technologies bring.

Recent studies focus on the search for quality indicators of teaching and learning use, asking whether technologies foster deep cognitive learning processes (Fütterer et al., 2022). To this end, the implications of technology use in supporting student learning are investigated, opening up an interesting and complex frontier of analysis. An example can be found in Michelene Chi's interactive constructive active passive (ICAP) framework (Chi et al., 2018; Antonietti et. al, 2023; Starks & Reich, 2023), which identifies four different types of learning activities: interactive, constructive, active and passive. Each of these activities includes different cognitive processes involved in the construction of knowledge structures (e.g. memorising, acting, connecting and inferring) and reflects different levels of learner engagement. In particular, the model argues that in moving from passive to constructive learning, students learn to find new knowledge and new connections between knowledge elements (e.g. creating concept maps, comparing information, solving problems). In interactive learning they interact and collaborate with others, constructing knowledge inferred from their own prior knowledge and information provided by partners (Chi et al., 2018; Morris & Chi, 2020; Wiggins et al., 2017).

Although this is not the place to delve into this research, the analysis approach is interesting, as it suggests the need for teachers to be prepared to manage these processes. Furthermore, knowledge must not be reduced to technical aspects, but must be integrated with educational plans to be applied for the purpose of instruction and the development of skills by students. Models for analysing the impact of ICT on learning and knowledge modification are supportive to provide tools to incentivise a functional use of technologies and, above all, to be able to evaluate the effects of educational proposals, being aware of the learning and social integration processes that are incentivised (Pinelli & Fiorucci, 2020). As Jenkins (2010) argues, young people are not content with listening to the teacher or taking notes and copying from the blackboard, they expect more lively and interactive modes of teaching, which involve them in producing content, also making use of technologies.

It is also useful to ask if and when technologies can be a barrier (Benigno et al., 2013), because it is first and foremost a question of breaking down any

impediments to the daily, facilitated use of tools. Interesting studies highlight the difficulties that teachers encounter in school life. Some highlight factors that directly involve the school organisation, such as technological support, support from fellow teachers and school administrators, software availability and Internet access (Hsu, 2016; Gallup, 2019; Smith, 2019). Information technology means cannot be ignored if knowledge and a correct approach to ICT is to be promoted.

The educational world is affected by these factors, to the point that the school, as a learning environment, cannot fail to rethink didactics without making room for IT tools, which must first of all be there, work, and be located in classrooms with Wi-Fi connections, projectors or multimedia boards, tablets or computers (Calvani, 2004).

Other studies highlight teachers' attitudes, such as reluctance and distrust in dealing with technology. Data from some surveys have shown that teachers are the main actors influencing students' use of technology in the classroom (Schnellert & Keengwe, 2012), highlighting the role of internal factors such as, for example, teachers' beliefs and attitudes towards ICT, and external factors such as, for example, training received and time available (Ertmer et al., 2012; Tondeur et al., 2017).

At school, it therefore becomes interesting to understand how technology is integrated into lessons, in which tasks it is effective, whether it is supportive in understanding topics, whether it is supportive in classroom management (Backfisch et al., 2021). The teacher plays an important role, he or she can be a promoter of the use of digital devices and software in the classroom (Fraillon et al., 2020), if he or she has a positive attitude towards technology, if he or she does not feel discomfort in engaging with it (Gomez et al., 2022; Scherer et al., 2020). These are elements, which it can be argued must be part of the competences required to do a good job of integrating technologies into education.

Integrating technologies into teaching requires teachers to rethink their teaching approach, to rethink not so much the content as how they propose it to students. Indeed, learning does not depend on the type of technology used, but rather on how digital technologies are used to stimulate and engage students in learning activities (Wekerle et al., 2020). Furthermore, studies agree that well-designed and content-integrated use of technology, based on differentiation, interactive learning and universal access, offers significant benefits even for students with learning difficulties (Basham et al., 2020).

Finally, there is also data that draws attention to digital competence and the resources available to students, also considering these elements as facilitators or barriers to technology-integrated teaching (Hsu, 2016; Gallup, 2019).

It is therefore important for everyone, students and teachers alike, to acquire digital competence, in the sense of being able to use information society technologies for work, leisure and communication with familiarity and critical

thinking. It must be supported by basic ICT skills, such as using computers to retrieve, evaluate, store, produce, present and exchange information, to communicate and participate in collaborative networks via the Internet (Recommendation of the European Parliament and of the Council of 18 December 2006 on key competences for lifelong learning (2006/962/EC), Official Journal of the European Union, 30.12.2006, L. 394/10-18).

2. Support teachers and ICT

The brief overview above highlights the present and future challenges for the world of education (Cope & Kalantzis, 2008). The spread and development of information and communication technologies must make us reflect on the appropriateness of new approaches to learning that, in order to emancipate themselves, cannot be limited to designing traditional teaching paths, but must appropriate new proposals, centred on the learner and the construction of knowledge (Marino, 2014). What is needed, therefore, are teachers who are competent in the use of technologies, and who are able to contribute to the promotion and development of participatory cultures that can enable students to excel with full rights in today's society.

Those responsible for the educational process must possess the specific knowledge, skills and abilities to be digitally competent. Competent from the point of view of foreseeing the didactic and/or training objectives to be achieved with their pupils (Rivoltella, 2015), aware of the risks of the reliability of the information available online and of legal and ethical principles. Aware of the fact that, over time, ICTs have established themselves as tools to support a didactics based on collaboration and knowledge sharing (Calvani, 2004; Moricca, 2016) in order to achieve complex educational goals and build inclusive learning contexts.

Teachers must be able, as Utgé et al. (2017) argue, to use ICT for different purposes, such as motivating pupils, responding to the specificities and educational needs of each one, stimulating autonomy, fostering the development of communication skills and promoting peer learning modes.

The latest National Digital School Plan (PNSD - MIUR, 2015), in continuity with its predecessor, aims to guide schools along the path of innovation and digitisation, as envisaged by the Good School Reform (Law 107/2015), through a strategy that simultaneously holds together the technological, epistemological and cultural dimensions.

To this end, the issue of teacher training is an indispensable aspect and, especially with respect to inclusion, represents the focus of teachers' teaching action, and

technologies, like other mediators, can contribute to the growth and success of all students, stimulating a process of critical reflection that helps to promote didactic innovation.

3. The course for supporting pupils with disabilities and ICT

In 2006, the approval of the UN Convention on the Rights of Persons with Disabilities represents an important moment of synthesis, a universally recognised reference on the subject of human rights, which places the person at the centre of attention in the first instance, without forgetting disability, which must not become a discriminating factor with respect to rights. In particular, Article 24 of the Convention reiterates the use of reasonable accommodation according to the needs of each individual, the use of supports to facilitate education and the creation of inclusive environments. These are principles that must involve all teachers at school, but which can find in support teachers the greatest expertise in designing appropriate and viable solutions.

In Italy, the issue of training teachers to specialise in supporting classes with students with disabilities now has a forty-year tradition. Specialisation courses for support teachers represent an organisational reality that has seen various activation methods over the years. To date, they provide 60 CFU for a total of 750 hours. They are authorised from year to year by the Ministry and are composed of 10 theoretical examinations covering a minimum of 270 hours of teaching, nine thematic workshops for a minimum of 180 hours of teaching, a direct internship to be carried out in the schools that have agreed to accept student trainees (module of 150 hours + 25 hours of revision with the tutor), an indirect internship of 50 hours at a university, an ICT course of 75 hours and a final examination. This 75-hour ICT course is perhaps the most systematic and targeted training opportunity to date for teachers, who have to measure themselves against platforms, technologies and apps for inclusive didactic design.

The evolution that the world of technology has undergone in the last twenty years represents a challenge for the construction of contexts that can foster the development of skills, knowledge and relationships in individuals with disabilities (Pinelli & Fiorucci, 2020; Moricca, 2016). The continuous proposals in the field of technology must lead to the question of how far solutions involving technology can and should be designed to improve the quality of life of humans. One wonders how to promote the creation of technological proposals that can start from the needs

and functions and develop solutions to provide supports, aids and solutions for people with disabilities.

One aspect of interest is the issue of learning, which sees the need for openness to systems that facilitate communication and access to content.

Communicating is a fundamental human need, it is needed to express, share and exchange thoughts, needs, emotions and more, it is needed to build social relationships and be in contact with peers (Polito, 2003). Learning is a fundamental objective, which guarantees each student the opportunity to build the knowledge, skills and abilities he or she will be able to spend in his or her everyday life, as well as in the profession.

At this point one may ask what role technologies play in promoting and supporting communication and learning processes in persons with disabilities, given the fact that the relationship between human beings and technology must be based on the ability to develop growth and change. The subject who uses technology must find in the technological support innovative, functional and profoundly meaningful tools (Dipace and Scarinci, 2021) to be learnt to use in everyday life, and not only in emergency phases (Perla, 2021), not only to be used by the subject with disabilities, but also to transform living environments using mediators that support communication and learning (Canevaro & Malaguti, 2014).

4. The investigation

Based on these premises, this study intends to analyse and discuss the way in which future support teachers approach the "Information and Communication Technologies for Learning" (hereinafter ICT) workshop at an early stage. As some authors point out, the TFA course is connoted not so much by the transmission of specific technical knowledge, but by the aim of developing methodological skills that enable reflection on how to effectively use technologies as integrated teaching strategies (De Anna, 2007, 2014; Pagliara, 2015) or as teaching mediums for learning (Moliterni, 2015). In addition to this, each professional called upon, in this case the teacher, has the opportunity to develop methods, methodologies and teaching strategies that he or she must be able to master in order to intervene in the teaching-learning action by applying the technological methods most favourable to scholastic success and addressing the issues of scholastic and social inclusion of each pupil.

In this contribution we will therefore try to bring out more than the knowledge and skills of the TFA support trainees in the digital field, above all the beliefs with regard to ICT and its use in inclusive education.

Teachers need extensive and continuous exposure to ICT to be able to evaluate and select the most appropriate resources. However, the development of appropriate

pedagogical practices is considered more important than the technical mastery of ICT. The digital skills that teachers need have long moved away from simply being able to use word processing and spreadsheet software. Digital skills that 21st century teachers should possess include cloud-based storage and sharing solutions, social media, web editing, image editing, presentation software, gamification, multimedia in general collaborative environments.

However, some teachers are not convinced of the benefits it can bring to their teaching. Classrooms in particular seem not to have been as quick to embrace advances in technology as other workplaces, although the pandemic period has certainly accelerated this process. In this regard Lord David Puttnam, an Irish philanthropist gave a talk on technology and education, offering the audience this analogy: «If you take a brilliant surgeon from 1913 and put him in an operating theatre today, there is nothing he can do, nothing he can contribute his skills to. Yet if you take a teacher from 1913 and put her in a classroom today, in many, many subjects she could teach what we would all understand as a lesson».

One only has to think of the call made as early as 2014 in *DigCompEdu: a framework for Developing and Understanding Digital Competence in Europe* (Ferrari, Brecko, & Punie, 2014), which outlines the conceptual reference areas for digital competence, namely information literacy, communication and collaboration, digital content creation, security and (technological) problem solving. While digital competences have been part of the basic education of citizens since 2006, the interest in digital competences of teachers and educators, who should train these competences, is more recent at least in terms of their formalisation through shared reference frameworks. The *DigCompEdu* was explicitly mentioned in the *Guidelines for Integrated Digital Didactics* (DDI, 2020), drawn up by the Ministry of Education, as a priority reference for the training of teaching and educational personnel in our country.

The research we carried out was strongly based on these references, involving a non-probabilistic sample of 115 teachers in training (TFA support) belonging to the I and II grade secondary school. Specifically, a questionnaire was drawn up for the survey to highlight initial knowledge, classroom use and expectations regarding the use of ICT in special education. The questionnaire was administered on the first day of the ICT workshop.

The questionnaire was constructed by highlighting three fields of exploration: the first part allowed for the collection of personal data; the second investigated incoming digital skills; the third the beliefs regarding the use of new technologies in inclusive teaching. All questions were measured on a three- or five-point Likert-type frequency scale, while only one last question ("What expectations do you have for this course?") was open-ended.

5. Results

The collected data show that the participants in the TFA support course at the University of Trieste have an average age of 37 years with a female participation of 85%; most of them have a second-level academic education (Master's Degree 94%), a small number have a postgraduate degree (PhD 4%) while an even smaller number have only a Diploma (2%). The origin is mainly from the North-East (58 trainees come from Friuli-Venezia Giulia, Veneto and Trentino Alto Adige), from the South (50 trainees come from Sicily, Calabria, Apulia and Campania), from Lazio 4 and from Lombardia 3.

Most of the students have already taught (74%) while 26% say they have never taught or have only done short substitute teaching assignments. When asked whether ICT can play a role in teaching, 97% answered that ICT can play an important supporting role in teaching, while only 3% thought it was not useful or only partially useful as a support in teaching.

In the questions relating to the importance of digital technologies for learning, we can see that the answers show that about a quarter of the respondents believe that the use of ICT is generally ineffective with pupils (in contrast to the answer to the previous question asking whether ICT could play a role in teaching, to which 97% had answered positively). In particular, the percentage of respondents who answered that they are completely useless or of little relevance (44%) was related to the case of pupils with excellent academic performance. Twenty-five per cent of respondents thought they were of little use in the case of pupils with disabilities. On the other hand, the percentage believing that they are particularly effective with non-Italian-speaking pupils increased (83%).

When questioned on how they use ICT in the classroom in their teaching practice, 34% of the trainees state that they do not usually prepare slides to support classroom lectures; in general, 47% state that they do not prepare material of any kind to support lectures. On the other hand, 13% admit that they do not document for lessons and 41% never exchange material with fellow teachers. The situation worsens when we ask how much collaborative environments are used (37% do not use them) or E-Learning platforms as support for both lessons and homework (as many as 65% do not use them).

An initial reflection on this data reveals both attitudes of reluctance towards ICT and an unwillingness to prepare lessons planned both in terms of content and the use of engaging mediators. These data are in contrast with the answer to the next question that asked how much digital resources can improve the learning process: 72% answered that they can improve learning a lot. This inconsistency in the answers may highlight that, although digital technologies are considered useful and effective in inclusive education, there are other factors that may hinder their use. One of the factors could be age, but we tend to rule it out given that the average age is 37, as already mentioned at the beginning for the biographical data, so from
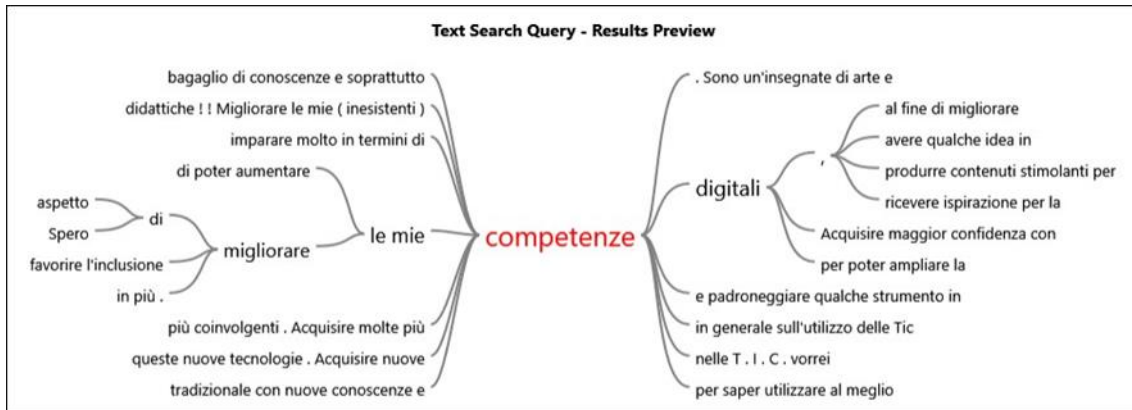
the subsequent analysis (in particular of the open answer) we could hypothesise a low sense of self-efficacy with respect to the use of digital technologies; we certainly believe that the reason that would lead teachers not to use ICTs, despite understanding their effectiveness for students in terms of raising the quality of learning and motivation, should be further investigated.

Another group of questions goes into greater detail to investigate what ICT can improve. 21% answered that they do not improve inclusion, while as many as 87% stated that they promote the acquisition of skills, as well as motivation (81%). However, the respondents are not convinced that ICT can be a support to make the personalisation of teaching more effective (20%). Respondents then state that technologies make students lose competences in writing (70%) and reading (46%) and in general half (47%) that they are a source of distraction from student learning. The analysis of the last open question allowed further interesting reflections. We analysed with the NVivo 12 software the frequency of the most recurrent words (max. 20) in the answer texts. They are presented in the following Word Tree.
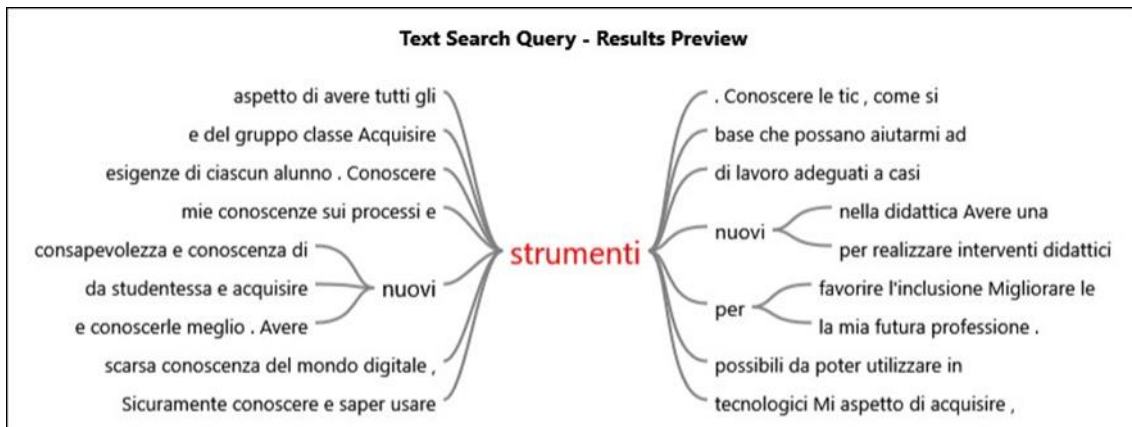

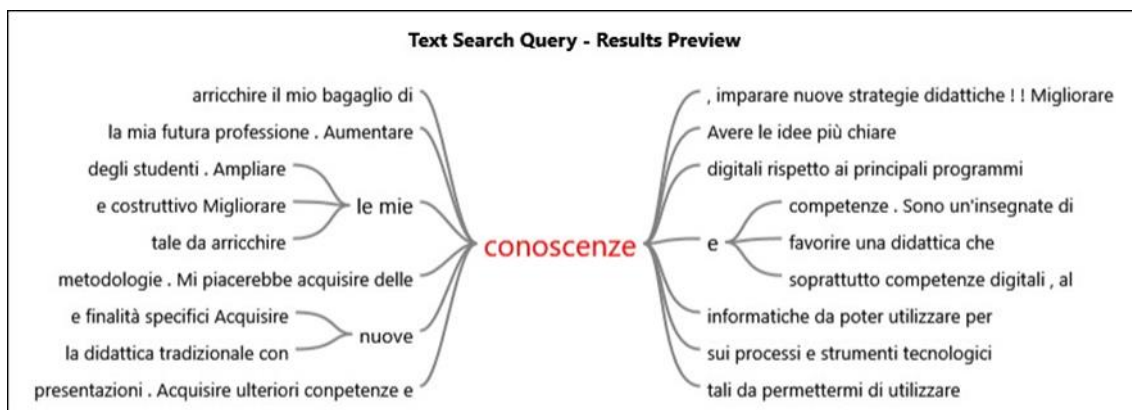Graph.1: the frequency of the most recurrent words

For the most recurring words (knowledge, skills, didactics, tools), we tried to understand the semantic connection attributed by the respondents through an analysis of the different words and the meanings attributed to them. Below are the semantic Word Trees.

Text Search Query - Results Preview

bagaglio di conoscenze e soprattutto
didattiche ! ! Migliorare le mie (inesistenti)
imparare molto in termini di
di poter aumentare

aspetto
Spero — di
favorire l'inclusione
in più .

migliorare

le mie — competenze

più coinvolgenti . Acquisire molte più
queste nuove tecnologie . Acquisire nuove
tradizionale con nuove conoscenze e

. Sono un'insegnate di arte e

digitali
al fine di migliorare
avere qualche idea in
produrre contenuti stimolanti per
ricevere ispirazione per la
Acquisire maggior confidenza con
per poter ampliare la

e padroneggiare qualche strumento in
in generale sull'utilizzo delle Tic
nelle T . I . C . vorrei
per saper utilizzare al meglio

Graph.2: the semantic connection for word "competenze"

Text Search Query - Results Preview

aspetto di avere tutti gli
e del gruppo classe Acquisire
esigenze di ciascun alunno . Conoscere
mie conoscenze sui processi e
consapevolezza e conoscenza di
da studentessa e acquisire — nuovi
e conoscerle meglio . Avere
scarsa conoscenza del mondo digitale ,
Sicuramente conoscere e saper usare

strumenti

. Conoscere le tic , come si
base che possano aiutarmi ad
di lavoro adeguati a casi

nuovi
nella didattica Avere una
per realizzare interventi didattici

per
favorire l'inclusione Migliorare le
la mia futura professione .

possibili da poter utilizzare in
tecnologici Mi aspetto di acquisire ,

Graph.3: the semantic connection for word "strumenti"

Graph.4: the semantic connection for word "conoscenze"
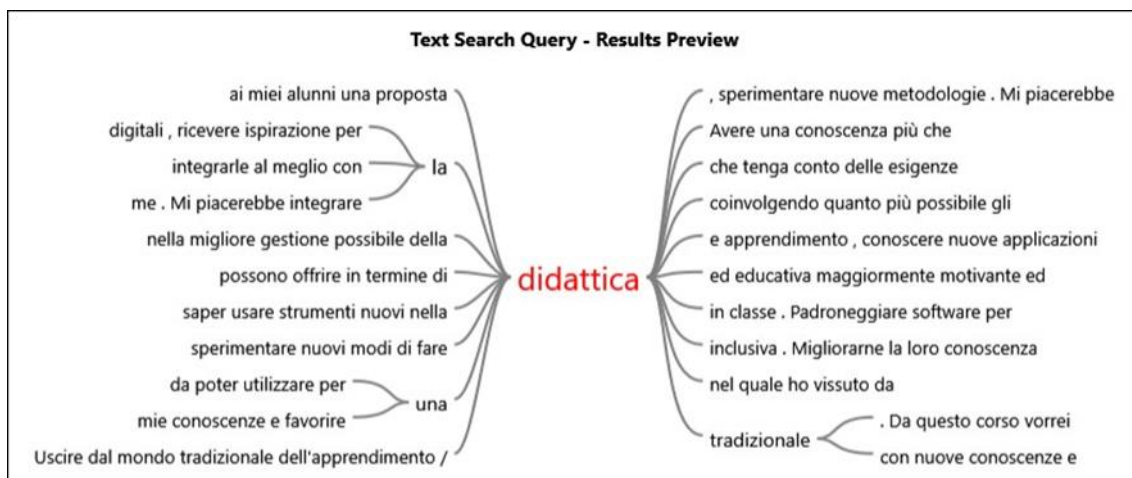
Graph.5: the semantic connection for word "didattica"

It is interesting, and worrying, that among the words most frequently chosen is not the word "Inclusion". This means that in the answers given, no one said that the expectation with respect to deepening the use of ICT was linked in any way to an improvement in the conditions of inclusion in the classrooms in which they work.

6. Discussion

The interpretations of the data collected with the teachers lead us to hypothesise some critical issues that concern not only teachers' ICT training, but also their professionalism in the secondary school. On the one hand, we can note that the general attitude towards ICT is quite favourable, they grasp its importance in the

planning and didactic reflection at school, especially with the most fragile pupils. On the other hand, it is still difficult to think that ICT can play an important role in integrating the learning of students who do not need (at least apparently) to be supported because they are already motivated, competent and autonomous.

The answers reveal a view of ICT as a tool for the exclusive use of the individual and not as a real possibility for the teacher to manage day-to-day teaching. It is alarming to read data stating that there is a lack of practice in preparing lessons, since the planning of content, supplemented by ICT, requires time and effort to prepare, aspects that belong to the teaching profession. Even more worrying is the failure to work in collaborative settings, as required in the European digital competence framework. This could be an interesting point to investigate in order to understand whether the lack of use in these terms is due to a lack of knowledge of digital tools that allow cooperative work or to the belief that the relationship and thus collaboration cannot be mediated and supported by technologies. From the questions that investigated the teachers' use of ICT in their daily school routines, a finding emerged that had already been noted in other studies (see e.g. Benigno, Chiorri, Chifari, & Manca, 2013): teachers use digital tools as an accessory to everyday didactics, not as central elements of action that are truly integrated into school practice. Our intention to investigate precisely the more personal aspects related to intrinsic or intrapersonal competences (teachers' beliefs) and conversely the real abilities to use ICTs (extrinsic competences, such as the scarce presence of technological resources or poor or very poor connectivity) follows those studies that had already investigated this phenomenon. There is, however, an important different fact: in the studies mentioned, there had not yet been the Covid-19 pandemic, which, as we know, gave a significant boost to the use of technology, especially in schools. It will be interesting to envisage a further survey with future TFA students. In re-submitting the same questionnaire, an attempt will be made to understand whether the acceleration given by the pandemic to the use of ICT was only 'a flash in the pan' as a response to the emergency and whether, therefore, once the 'danger' had passed, the use of technology would return, leaving room for traditional tools (paper, for example).

Conclusions

With this work we wanted to investigate the initial competences of a group of trainees engaged in the TFA Support during the workshops dedicated to Digital Technologies for Inclusion. The fact that struck us is that, while recognising to some extent the need to use ICT in teaching, there are no clear references to skills acquired in previous training. Clearly, our investigation does not stop here, but will

compare these data with those we will collect at the end of this seventh cycle of TFA support, in the hypothesis (and hope) that there is compensation for the initial training gap with respect to the integrated use of ICT.

Therefore, it remains a hot topic to reflect on the fact that access to TFA courses should not be the first opportunity for systematic training in the use of ICT and project management. Further in-depth study on the subject will be carried out next year, with a follow-up, to assess the impact that the skills acquired during the TFA support course have had on the daily use of ICT and, in general, on the conscious professional action of the specialised teacher.

One of the risks we must try to avoid is that digital competences remain separate from the disciplines and are seen as responses to individual needs, without intertwining with the digital evolution in teaching-learning contexts. There is a high risk of missing the greatest opportunities for growth and development of knowledge itself.

We can conclude, with respect to the data collected and the reflections made, that there is a need for reflection with respect to the role of research as a significant field. It must proceed with a critical analysis of the processes of change that applications can generate in individuality and in society, an important element that must involve in the first instance the recipients of the project, that is, persons with disabilities (*inclusive research*). Only in this way can the important role that technologies will assume, if duly designed, evaluated and used, make a major contribution to breaking down physical, social, communicative and digital barriers and, at the same time, become a vehicle for overcoming cultural barriers, reducing boundaries of space, language and communication.

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