A descriptive survey on New Learning Technologies: a sample of Italian teachers

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Abstract

Educational possibilities have been for a long time limited by the imagination of the teacher, to date the training of students has changed. The most fascinating feature of new technologies are physically limited places in which the student is immersed. New technologies allow the interaction of 3D projects with orientations and scales not previously possible. Improvements come not only in education but also in society. It develops innovative and critical thinking, problem solving and empathy. Hence the importance of having an opportunity for practical experience. The sample consists of 10,000 Italian teachers of all grades and levels of education and the purpose was to investigate their recognition of new technologies on student learning. Our descriptive analysis shows how important it is to have a thorough understanding of the effect of new technologies on the student. This can be done in all school classes.

Keywords: teachers; technologies; intervention; behavioural; model; features.

1. Introduction

Learning must be implemented collaboratively between teachers and students. Teachers must have the ability to incorporate technology into the classroom. Innovation and creativity are important, as are communication, teamwork, critical thinking and problem-solving. Teachers are required to use new technologies for both teaching and administration in today's educational institutions [1]. When it comes to technology adoption, they also act as agents of change in their schools [2]. Teachers employ technology in two ways [3], one of which is to achieve the same traditional goals in the same settings without having to drastically change classroom activities. The second method involves using technology in the classroom to break down barriers, connect students to real-world activities, and help them become self-sufficient students. According to Munoz-Miralles et al. [3], advances in technologies that have led to a number of advantages, including new means of communication, functionality and learning, are particularly useful for universities in providing comprehensive and efficient training to students who will become technology specialists in the near future. In addition, experts [4] state that the use of new technologies stimulates and involves pupils, making them one of the drivers of learning in education. Study strategies are important for academic progress as each student learns differently. Because students are constantly exposed to technology, they incorporate it into their studies in various ways. As a result, the educational community has become more interested in the way in which pupils learn in relation to their use of technologies, as indicated by the research of Orellana and colleagues (2010) [5-6]. The most fascinating feature of the new technologies, according to Yazon et al. [7], is how it can be employed in university education and how it improves the learning process. In many aspects of social life, but particularly in education, information and communication technologies are becoming more common and vital.

As a result of having a contact point, the training of students has changed. Innovative technologies are becoming an important component in the education sector, enabling teachers to undertake demanding training activities that are not possible with traditional technological approaches [8]. Virtual and augmented reality technology (VAR) is one of the most innovative technologies of this century and higher education is in the early stages of adopting innovative technology as an educational tool [9-10]. Adoption has been driven by scientific, technological, engineering and mathematical disciplines (STEM), in the wake of the industry's rapid demand for the workforce of the future [11]. VAR technology can be used to deliver immersive learning experiences: augmented reality projections, built virtual 3D reality and 360-degree interactive video. Technology has the ability to bring students to physically limited places (construction sites or informal urban settlements). Allows interaction with 3D models or designs with orientations and scales not previously possible. The skills generated for VAR students in education include: spatial visualization, innovative thinking, problem-solving, critical thinking and empathy [11]. The exciting educational possibilities are limited only by the imagination of the teacher. It follows that the opportunity to have hands-on experience with VAR technology is critical to an educator's willingness to adopt technology in their teaching. This is particularly important as there is a wide range of teaching methods that can be used with VAR technology [10]. VAR alone does not guarantee positive learning outcomes [12]. A review of 25 virtual laboratory studies in engineering and science reported that 13 studies concluded that there were no effects or adverse effects on the learning outcomes of students [12]. For educators in higher education, it is critical to develop appropriate teaching content by learning from practical experience and positive examples of VAR education in their disciplines. However, universities are reluctant to invest in new infrastructure if they do not have a pre-confident number of users that guarantees good value for money. There is currently a gap in research on VAR adoption rates in a higher education institution [13]. In addition, new technologies can cause discomfort, mainly in the form of headaches when using headphones [14], so it is crucial to select the right technology for learning cases. Furthermore, poor educational experiences can be exacerbated by inadequate use of technology; such as the limitation of the number of headphones per class due to cost [13]. Finally, there is a lack of published research on projects and optimal costs for new teaching technologies and a lack of data from longitudinal studies on the adoption of innovation in entire higher education institutions.

2. Materials and methods

The sample consists of 10.000 Italian teachers randomly selected from all over the Nation. Specifically, the sample consisted of: (a) teachers from all over Italy, (b) ordinary and support teachers, (c) teachers from kindergarten to high school. The sample consisted of 8870 females and 1230 males teachers. The data were collected by the Centre for Research on Disability (DRC) of the University of International Studies in Rome using an online questionnaire structured by qualified psychologists.

2.1 Instruments

Online questionnaire: to investigate how much teachers know about the innovation of new technologies. In addition, the questionnaire aims to highlight the extent to which teachers consider it useful to master new technologies for structuring behavioural change educational programmes. The last questions of the questionnaire concern the Italian school system and it is assessed how this is ready to take advantage of appropriate behavioral education strategies to make the school contexts truly inclusive. The questionnaire was divided into three sections as shown in Table 1.

Table 1 – Questionnaire sections, items and answers

Sections	Items		Answers
1	1	Sex	M or F
	2	Age	18-30; 31-45; > 45
	3	School grade	kindergarten; primary school; middle school; high school
	4	Years of employment	<5; 5-10; 10-20; >20
	5	Job position	Ordinary; support teacher
	6	Location	North; Centre; South
2	1	In your opinion, do you find useful the application the new technologies?	Yes or No
	2	In your school experience, what hinders pupils' learning?	Lack of previous specific training, Lack of collaboration between colleagues, Lack of collaboration with the family
	3	In your opinion, what is the area where innovative technology is most effective?	Learning, Socialization and integration with peers, behavior regulation
3	1	In your opinion, are all teachers able to use new technologies?	Yes or No
	2	In your opinion, what would teachers need to push them to move from traditional to innovative teaching?	Specific university training for teachers with not only theoretical but also practical references; collaboration with specialized support teachers, knowledge about the positive results in behavior and learning
	3	Do you know what are the main new technologies used in school system?	Yes or No
	4	In your opinion, as well as being useful for the student, do new technologies facilitate and improve the performance of the teacher as well?	Little, Enough, Very, Absolutely
	5	According to your knowledge, why are new technologies so effective for the student?	Because it increases motivation and participation, because it increases entertainment, because it gives an immersive experience of learning
	6	Do new technologies have an economic impact on schooling?	Little, Enough, Very, Absolutely
	7	In your opinion, what are the limits of technological innovation?	It needs a specific training, it needs specific facilities like an internet connection, LIM.., children could get distracted easily, it could not be replicated at home

3. Results

The data analysis was based on response rate of participants at the online questionnaire.

Based on the answers the sample section 1 consisted in: 8770 females and 1230 males teachers; 5010 teachers were > 45 years old, 4310 from 31 to 45 years old, 680 from 18 to 31 years old. In addition, 1450 worked in kindergarten, 3220 in primary school, 2330 in the middle school, 3000 in the high school. This is reported in Figure 1a.

We found that 3560 teachers have worked for less than 5 years, 2280 from 5 to 10 years, 2020 from 10 to 20 years, 2140 more than 20 years. Specifically, the sample was divided into 4050 ordinary teachers and 5950 support teachers and 2610 came from North, 3580 from the Centre and 3810 from the South of Italy. This is reported in Figure 1b.

About the section 2: teachers answered (8354) that they find useful the application of new technologies followed by (1646) who answered no. Moreover, as shown in Figure 2, teachers answered (5212) that the main difficulty that teachers face was lack of previous specific training followed by (1858) lack of operational tools made available by the school, (2930) lack of collaboration with the family. Furthermore, teachers answered that the main area in which new technologies is most effective was (3001) learning, (4102), Socialization and integration with peers, (2897) behavior regulation.

About the section 3: as shown in Figure 3a, the main part of the sample (6561) answered that every teacher could use new technologies instead of (3439) who answered no. In addition, the main part (4738) of the teachers believed that Specific university training for teachers with not only theoretical but also practical references could be the main reason to adopt a new teaching approach then, (2231) collaboration with specialized support teachers and (3031) knowledge about the positive results in behavior and learning. The main part of the sample (6432) do not know what are the main new technologies implicated in learning instead of (3568) who answered yes.

The main part of the sample (5340) answered absolutely at the statement "new technologies facilitate and improve the performance of the teacher as well" instead of (2323) enough and (5337) answered very. Teachers (4940) answered that the main area that new technologies could improve was an immersive experience of learning, followed by (2143) increasing motivation and participation and (2520) increasing entertainment. The main part of the sample (9543) answered absolutely at the statement "Do new technologies have an economic impact on schooling?" instead of (457) enough.

Moreover, as shown in figure 3b, in their opinion the main limit in this new approach is (5045) specific training, followed by (1213) logistic facilities, (2345) children could get distracted easily and (1397) not replicable at home.
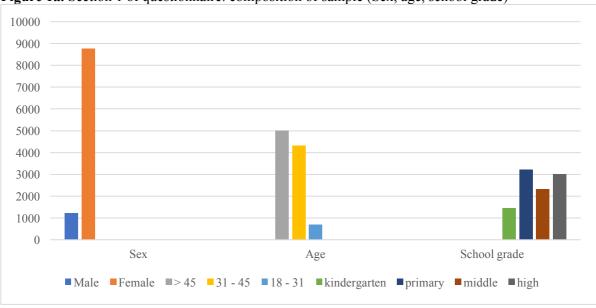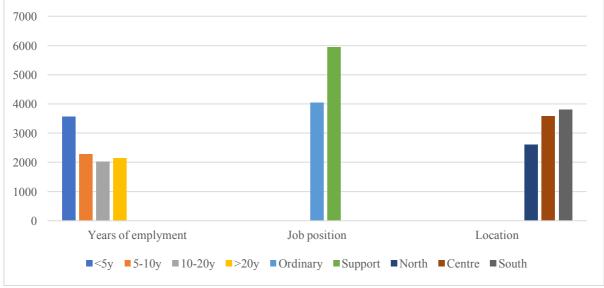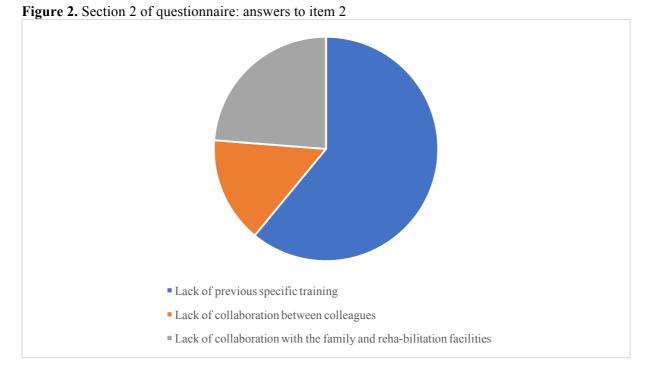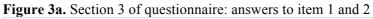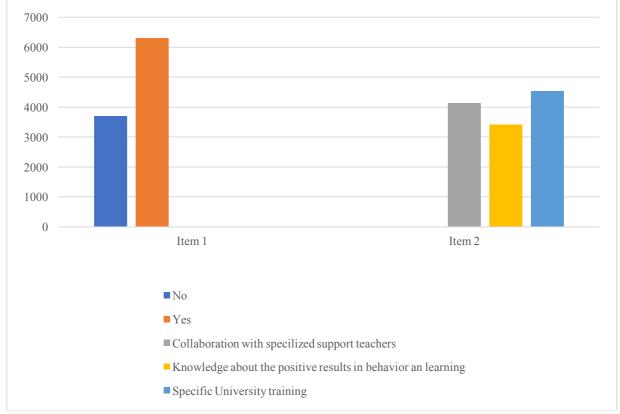
Figure 1a. Section 1 of questionnaire: composition of sample (Sex, age, school grade)

Figure 1b. Section 1 of questionnaire: composition of sample (years of employment, job position, location)

Figure 2. Section 2 of questionnaire: answers to item 2

- Lack of previous specific training
- Lack of collaboration between colleagues
- Lack of collaboration with the family and reha-bilitation facilities

Figure 3a. Section 3 of questionnaire: answers to item 1 and 2

- No
- Yes
- Collaboration with specilized support teachers
- Knowledge about the positive results in behavior an learning
- Specific University training

Figure 3b. Section 3 of questionnaire: answers to item 7

- It needs a specific training
- it needs specific facilities like an internet connection, LIM
- children could get distracted easily
- it could not be replicated at home

4. Discussion

The history and development of technology to help the educational process, eliminates any doubt that technology has the potential to revolutionize the traditional teaching and learning process, improve teaching pedagogy through synchronous and asynchronous modes, remove barriers to education imposed by space and time, and greatly expand access to lifelong learning. Although universities have generally been quick to adopt new technology platforms, their use of technology to improve the teaching and learning process has been slow for various reasons. Today more than ever, a new reform is needed to revolutionise higher education practices. Technology-supported learning (TSL) is described as the incorporation of technology into learning environments that can improve knowledge, skills and attitudes [15]. Technology-supported learning is not simply the adoption of software and applications to effectively manage the learning environment, but it is a well-structured tool that addresses the educational purposes and objectives of improving the student's acquisition of useful educational goals by introducing technological devices [16]. The literature shows that there are basically two delivery modes for the learning environment supported by technology. In synchronous mode, a face-to-face environment is created that involves the simultaneous presence of the instructor and/or the learner/s. Delivery mode can be via application sharing, conducting live presentations and surveys, Manage group dynamics, share digital whiteboards and even conduct real-time online assessments. The main challenges for the educational system in many developing nations are accessibility, equity, convenience, quality and accountability. In today's society it is now clear that in order to study, work and communicate, it is necessary to develop and possess a good knowledge of the use of technologies. Students are increasingly required to develop skills, to know how to use them consciously and adequately, to be able to enter an increasingly complex society and characterized by a strong influence of information and stimuli. In today's school there is therefore much debate on the introduction of information and communication technologies (ICT) in teaching. The question arises as to what skills and abilities teachers should develop in order to be able to use the available IT tools in a functional way and make them a valid support for achieving specific learning objectives [17]. Teachers should therefore learn how to make the most of ICT properties, both to support teaching activities and to pass on these skills to students. It involves developing different skills, such as: creatively and flexibly using

processing software (such as text editors, spreadsheets, presentation programs); developing a critical ability to search, analyse the evaluation of information that can easily be found through the internet; design and reorganise lessons in order to exploit the potential of multimedia; produce digital content that can then be shared and co-built [18]. There is a great deal of debate about the potential that technology offers us, the advantages it brings, the simplifications it allows us to achieve, the speed with which it allows us to achieve certain goals. The question arises as to how it can be put at the service of the school, with the aim of achieving better learning targets for students [19]. The reflection becomes even more complex if we think about the use of technologies in teaching with students with disabilities or Special Educational Needs (BES). In this case, in fact, we must both ask ourselves how technology can help the student to achieve teaching and learning objectives, facilitating the acquisition of knowledge, both how and when it can help it to circumvent specific difficulties and problems, in order to ensure its real inclusion in the class.

Based on this descriptive analysis, we found that teachers know little about how the use of new learning technologies could affect positivily the learning process. Moreover, the main difficulty that teachers faced was the lack of previous specific training: this data indicates that teachers are not trained enough about these specific tools. Nowadays, is very common to find children with SLD, so it is essential that teachers could be trained about these specific disorders and related new approaches procedures. Despite the lack of the teachers' acknowledgment about new learning technologies, it is shared the effectiveness of this kind of intervention. More specifically, it emerged that the major improvement through the use of new technologies methods was in socialization and peer integration, behavior regulation, cognitive and academic skills.

In conclusion, in order to improve and enhance the diffusion and knowledge of new learning technologies it could be implemented specific training for teachers as themselves reported.

5. References

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