Journal of Inclusive Methodology and Technology in Learning and Teaching
ISSN 2785-5104
Anno3 n.4(2023)

EDIZIONI UNIVERSITARIE ROMANE
editoria scientifica dal 1952

ONLINE VIDEO TRAINING TO IMPROVE DIGITAL COMPETENCE AND COMPUTER SELF-EFFICACY FOR SUPPORT TEACHERS

Vincenza Benigno [1]*, Sabrina Panesi [2], Giovanni Caruso [1], Edoardo Dalla Mutta [1,3], Chiara Fante [1], Lucia Ferlino [1]

1 Istituto per le Tecnologie Didattiche - CNR; benigno@itd.cnr.it; caruso@itd.cnr.it; fante@itd.cnr.it; ferlino@itd.cnr.it; dallamutta@itd.cnr.it
2 DISFOR Università di Genova; sabrina.panesi@edu.unige.it
3 DLCM Università di Genova; edoardo.dallamutta@edu.unige.it
* Correspondence: benigno@itd.cnr.it

Abstract: In Italy, support teachers are required to follow a specific special needs teacher-training programme that includes an ICT-lab. This paper describes an online video training course specifically developed for this part of the programme during the period of pandemic connected to COVID19. It investigates how the course may influence the way support teachers perceive knowledge and competence acquisition related to technology use, specifically focusing on the construct of ICT self-efficacy, outcome expectation and interest. A total of 233 participants took part in the study. They filled out the ITIS scale and ad hoc surveys both in the pre- and post-treatment phases. T-tests for paired samples and sequential multiple regression analyses (stepwise method) were conducted. Results showed changes in their perception about (a) technological skills, (b) the effectiveness of digital technologies for developing inclusive projects, (c) computer self-efficacy, outcome expectation and interest, and (d) how the employment of videos in the course and absence of time constraints impacts on self-efficacy. Practical implications, limitations, and suggested further research are also discussed.

Keywords: Support teachers, computer self-efficacy, outcome expectation, interest, digital competences, online video training, e-inclusion.

[1] The article is the result of the scientific collaboration of the authors. However, the attribution of scientific responsibility is as follows: Conceptualization: VB Data Curation: EDM, GC Formal Analysis: SP Investigation: VB, GC, EDM, CF, LF, SP Funding acquisition: LF Methodology: VB, LF, SP Project Administration: LF Resources: VB, GC, EDM, CF, LF Software: GC Writing Original Draft: VB, LF, SP Writing review and editing: VB, GC, EDM, CF, LF, SP.

EDIZIONI UNIVERSITARIE ROMANE
editoria scientifica dal 1952

1. Introduction

Italy has a strong, well-established tradition regarding inclusion within mainstream education. This is the fruit of a long process of legislative and organizational reform that reflects pervasive cultural changes. The historical excursus of Italy's laws on inclusion established that students with disabilities should be into mainstream classes.

Parallel to evolution in Italian laws promoting school inclusion, the role of the support teacher has also changed. For years, this role was oriented towards supporting the students with Educational Special Needs and Disabilities (SEND) through fostering of personalized paths and integration with classmates. Ministerial directives issued as part of Law 104/92, art. 13, position the support teacher as a co-teacher assigned to the whole class, with educational tasks that do not only concern students with disability (Ianes, 2014).

This change in role reflects a revised cultural approach of co-responsibility in managing the whole class by all teachers. In any case, a specific training course is required for support teachers.

In Italy, a one-year postgraduate specialisation course called "special-needs teacher training" is offered (Ministerial Decree No. 249 of 10 September 2010). This is addressed to school personnel qualified to teach either at primary or secondary level. At its inception, the main aim of this course was to develop specific knowledge and skills covering areas like special pedagogy, legal aspects, and the use of educational technology.

Before the COVID19 lockdown, the entire course was proposed exclusively in a face-to-face mode. In the post lockdown period, specifically for the fifth edition (from January to June 2021), the course was offered in an online mode. The part of the course devoted to digital technologies (the so-called ICT-Lab) was delivered in asynchronous mode following a supported online video training approach.

The main aim of the ICT-Lab is the acquisition of knowledge and competencies related to use of technologies that can support pedagogically sound educational paths for students with SEND (Fedeli & Pennazio, 2022; Bocconi et al., 2020). Informed use of technology requires high technological competence on the part of teachers (Bembich, 2015; De Angelis, 2021; Fedeli, 2022; Pinnelli & Fiorucci, 2020). Despite the considerable financial investments devoted to the introduction of digital technologies in Italy's education system, integrating these technologies in a pedagogically meaningful way remains a challenge for schools, and the mere presence of digital technologies in classrooms does not translate into better learning outcomes (Bocconi et al., 2020).

In particular, teachers' perception of their digital competence (Bocconi & Panesi, 2018) and their self-efficacy related to their use could appear critical variables that influence efficacy of integration (Benigno et al., 2013). Clearly, digital competencies are difficult to foster in traditional educational contexts where the face-to-face lesson focused on delivery of content is still the preferred approach.

In the context of support teacher training programs, it is critical to develop courses focused on active learning and participant engagement, especially where skills in the appropriate use of technology are to be fostered.

Starting from analysis of the critical issues highlighted, and in response to conditions connected to the COVID-19 pandemic, we developed an ICT-lab using online video lessons.

The focus of the study reported in this paper is on exploring whether the ICT-lab featuring online video lessons positively affected participants' technological competence, computer self-efficacy, and technology use, especially within the context of students with SEND.

2. Supported Online Video Training

Clearly, digital competencies are difficult to foster in traditional learning settings where the frontal lecture focused on content delivery is still the preferred approach. In this light, adoption of asynchronous online learning (AOL) (Andresen, 2009) can be considered a useful approach which integrates various activities, from individual to group participation. Moreover, it plays a strategic role in the acquisition of both technical and reflective skills, since it requires students' active, informed participation. AOL promotes deeper learning as it allows students to access course content at any time, and the extra time afforded allows them to reflect more deeply on course materials.

AOL environments have increasingly relied on the use of video content in recent years, thanks in part to increased Internet bandwidth and speed, the ease of use of mobile devices, and the presence of media hosting and sharing platforms offering free streamed content. Indeed, supported online video training is the main delivery method used in massive open online courses (MOOCs) (Rismark & Sølvberg, 2019; Watson, 2017).

In fact, video lessons can be used to show materials and cases, to simulate a laboratory experiment (Sablić et al., 2020), or to demonstrate how something can be done (Asensio et al., 2006; Halls, 2012; Surgenor et al., 2017) and they can reveal how something works by providing information about things that are difficult to explain with pictures and text alone (Colasante, 2011; Sherin & Van Es, 2008; Zhang et al., 2006) and can facilitate learning (Dalal, 2014; Pappas et al., 2017; Turan & Çetintaş, 2019).

An advantage of the use of video lessons is linked to the greater accessibility of the contents compared to other ways of delivering lessons. The materials are presented in multimedia form, so this makes it possible to add subtitling and speech transcription. In this way the learner can review and revise important or unclear passages.

Moreover, leaners can follow asynchronous lessons (in this case video lessons) when and how they like, something they cannot do with synchronous lessons.

Despite the various advantages that use of video lessons can provide to enrich educational university courses (Ramos et al., 2022) several research studies have also identified limits relating to their use. Critical factors that have emerged are the isolation that students perceive (Moody, 2004; Hart, 2012; Bellocchi et al., 2016) and a low level of engagement with the content that derives from the lack of immediate communication between learners and instructors (Kim et al., 2018). While Stewart et al. (2011) revealed that while students' initially intend to maintain a constant level of commitment in following the contents they access, this only manifests close to the deadlines for assignments or exams.

Ou et al. (2019) affirmed the importance of using videos in formal and informal learning contexts. On this basis, they responded to the aforementioned critical issues by proposing a model based on seven principles drawn from instructional design theories for the design and development of video lessons for an online degree course.

This seven-principle model is comprised of four instructional methods, one principle for instructional sequence, and two principles for instructional presentation.

As far as instructional methods are concerned, the authors refer to the following teaching approaches, which should facilitate learners' learning with video lessons and help them achieve learning objectives:

- Learning by example - learning takes place when students actively build their knowledge by referring to activities demonstrated by those with greater skills;
- Learning by doing - active learning understood as doing things and at the same time thinking about the things that are happening (Bonwell & Eison, 1991). This engages the students in a much more active way and has greater learning effectiveness (Prince, 2004);
- Adaptive feedback - when video lessons are coupled with exercises for student practice (as is often the case in online courses), this encourages active learning;
- Learning through reflection - reflection is a step towards metacognition, and this is an enabler of learning.

Regarding sequencing, the authors adopt the model proposed by Merrill (2002) and suggest that the most effective learning environments are those focused on problems. Merrill (2002) lists four actions involved in the use learning material: (1) activation of previous experience; (2) demonstration of skills; (3) application of skills; and (4) integration of these skills into real-world activities. Finally, with regard to presentation, the author suggests that the videos for learning should adopt a conversational style in order to trigger sensations of a social presence in the students, a factor that encourages them to regard with the screen coach/author/instructor as a social interlocutor. Finally, it is deemed necessary to insert multimedia graphic elements to foster greater and more effective learning.

Based on these studies, we have developed an online video training course for support teachers based on the intensive use of videos in order to promote greater competence in the use of technologies and greater awareness of their use in the context of special education. To the best of our knowledge, no studies have yet been conducted that address these issues.

3. Computer Self Efficacy, Outcome Expectations, and Interest

Today, the successful integration of ICT into classroom practices involves a paradigm shift in teaching. This requires greater effort from the trainer who, from careful analysis of the factors that can positively or negatively affect successful integration, should help teachers to acquire positive attitudes and adequate levels of self-efficacy.

Computer Self Efficacy (CSE) understood as a judgment of one's capability to use a computer (Coban & Atasoy, 2019; Compeau & Higgins, 1995; Marakas et al., 2022; Yeşilyurt et al., 2016; Wang et al., 2021), can be considered one of the factors that most strongly impacts on the integration of technology in teaching practices. CSE significantly conditions the amount of effort people invest in carrying out specific projects in which the use of ICTs is envisaged, their perseverance in the face of obstacles and failures, and the level of satisfaction derived from achieving the objective (Chifari et al., 2000).

As Wood and Bandura (1989) state, positive self-efficacy beliefs mobilize motivation, cognitive resources, and the sequence of actions required to achieve certain

goals. Another important but less extensively studied factor in the literature concerns outcome expectations (OE). According to Bandura (1986), efficacy expectations refer to the belief about one's ability to implement an adequate course of action to achieve pre-established levels of performance, while result expectations refer to judgment regarding the probable consequences that such actions will produce.

OE concern the degree to which individuals believe that an action leads to a particular outcome and the value placed on that outcome (e.g., if I do this, what will happen?) (Lent et. al., 1994; Lent et al., 2008). OE plays a very important role in human motivation: "unless people believe that their actions will have desired consequences, they have little incentive to exercise those actions" (Pajares, 2002). It is also vital in promoting behaviour: "expectations are important because they help people form cognitive maps, or internal plans [which they use] to determine the best course of action to achieve a goal" (Schunk, 2000).

OE beliefs therefore play a key role in motivating individuals to sustain behaviour or actions over long periods of time if they believe that their actions will eventually lead to the desired results (Niederhauser & Perkmen, 2010). Individuals develop interest mainly in areas in which they judge themselves to be effective (SE) and for which they see a greater chance of obtaining positive results (OE).

Another important factor is interest, considered as an equally important motivational mechanism and a strong predictor of intentions (Fouad et al., 1997). This factor appears to be central to learning and performing goal-directed behaviours and is an important predictor of intentions (Fouad et al., 1997). Interest is defined as a psychological state that occurs during interactions between human beings and their objects of interest. It is characterized by attention, concentration, and emotion. As an individual's interest develops in a particular aspect, emotions are accompanied by the development of cognitive components.

According to Bandura (1986), individuals show interest in those areas in which they judge themselves as effective and for which they see positive results. Surprisingly, no previous study has conducted comparative investigations on the role of online video training in supporting the improvement of computer self-efficacy and in promoting greater awareness of the use of technologies in the context of inclusive teaching.

4. The Study

4.1. Research Questions

The main purpose of the reported study is to explore how the adoption of a training path based on the use of video lessons can improve self-perception related to improved technological skills and the sense of self-efficacy in their use in special-needs teacher training.

In this light, the following research questions are investigated:

RQ1 - Are there differences in participants' perception of skills and technological actions before and after the course?

RQ2 - Are there differences in the participants' perception of the use of technologies for supporting SEND before and after the course?

RQ3 - Are there differences in participants' perception of how they evaluate their computer self-efficacy, outcome expectation and interest in the use of technologies?

RQ4 - What aspects of course delivery (i.e., usability of the course through video lessons) influence participants' evaluation of computer self-efficacy, outcome expectation and interest in the use of technologies?.

4.2. The Developed Approach

An ICT-lab course was developed and divided into nine modules, each of which dedicated to a specific topic (see Supplementary Materials). In accordance with the overarching aims of the study, the course contents were mainly transmitted using video lessons, and for each topic further in-depth materials were provided. Development of the video lessons was in line with the principles proposed by Ou et al. (2019). Therefore, each subject-matter expert developed videos to support active learning, and to improve methodological and technological skills. The online course was delivered through the MOODLE platform (https://sosteniamoci.itd.cnr.it). The participants were grouped based on their school level (kindergarten, primary, middle school, secondary school) and they were proposed the same lab topics, only the activities were adapted to the school teaching level.

In regards to overall use of the ICT-lab, the participants were free to access the platform as they wished and to view the videos as many times as they wanted. The subject-matter expert could be contacted for clarifications via a dedicated area of the platform. Each module featured checks and called for the development of multimedia products, both individually and in groups, to which the subject-matter expert gave feedback. Each subject-matter expert chose and developed assessment activities in accordance with the type of content presented and the technological tool with which the teachers were to familiarize themselves.

5. Methodology

5.1. Instruments

Ad Hoc Survey

The ad hoc survey was administered in two rounds. The first questionnaire (administered at the beginning of the course) contains 54 items, while the second (administered at the end of the course) has 83 items, some of which are closed-ended and others presented in Likert format, with items graded differently depending on the type of evaluation required, these fall into three different sections.

In this study, only those items present in both questionnaires were taken into consideration; these fall into three different sections. The first set of questions concerns the participants' socio-demographic profile, collecting personal data, (i.e., gender, age, educational qualifications, school level/s taught). The second section regards the use of technologies in teaching, specifically skills in using particular technological tools (i.e., systems for archiving and sharing documents, systems for synchronous communication) and the actions they are able to perform when using a computer to generate content (i.e., edit a video, edit an image, create a website). The third section of the questionnaire collects information about the use of technologies with students with SEND (i.e., difficulty in the use of educational technologies in the classroom) and explores expectations related to how participation in the course can help support teachers develop technological competences to foster inclusive pro-

cesses (i.e., competences related to assistive technologies beneficial for carrying out inclusive projects, etc.).

In addition to the above, a further set of items was proposed in the second questionnaire. These were designed for obtaining information on the usability of the online course, on the contents covered in relation to expectations, on the possibility participants have of providing prompts to help their students reflect as part of inclusive teaching activities and, finally on the effectiveness of the evaluation tasks set.

In order to address the research questions posed in this study, we focused specifically on a set of items regarding: (a) the participants' individual self-perception of their competence and actions concerning technologies; (b) their perception of their use of technologies for supporting students with SEND; and (c) aspects of the training course we proposed.

ITIS Scale

The Intrapersonal Technology Integration Scale (ITIS) (Niederhauser & Perkmen, 2008) was used - in the Italian version validated by Benigno et al. (2013) - to assess the beliefs and attitudes of teachers regarding the use of Information and Communication Technologies (ICT) in the educational contexts. The Italian version of the ITIS comprises three scales rated on a five-point Likert Scale, from 1= strongly disagree to 5= strongly agree. The Self-Efficacy scale (SE) measures teachers' perceived level of self-efficacy towards ICT, namely self-confidence in their ability to use ICT in the classroom. The Outcome Expectations scale (OE), comprising the SOE (Social Outcome Expectations), SEOE (Self Evaluation Outcome Expectations) and POE (Performance Outcome Expectations) subscales, assesses perception of possible advantages deriving from use of ICT. Finally, the Interest scale (INT) evaluates interest in using ICT in the various educational activities in which they can be beneficial.

Procedure and Data Collection

The reported study stems from a survey conducted in Italy in the context of a course for teachers seeking to obtain the specialisation qualification needed to teach as support teachers; part of the course involved specific training in ICT. The course was conducted completely online and almost entirely in asynchronous mode; the only synchronous activities proposed were an opening and a closing meeting held online using the Microsoft Teams platform. Both ad hoc and ITIS questionnaires were administered online during the two synchronous meetings, using Google Forms.

Data collection was conducted in compliance with the EU General Data Protection Regulation (GDPR, 2016). Specifically, the in-house questionnaire was designed in accordance with privacy by default principles, as specified in Article 25 of the Regulation, so as to reduce the personal and special data to be collected and minimize the ethical impact, as recommended by Hoerger & Currell (2012). Participants filled in the questionnaires on a voluntary basis.

Participants

A total of 233 participants took part in the present study. Most were women (87.55%), a proportion in line with the general profile of Italy's teacher population, as gauged by the OECD (OECD, 2023). The largest age range was that between 30-39 years old (39.1%), closely followed by the 40-49 age range (36.1%). Most of the par-

ticipants held a university degree (78.11%). Data on education role covered reveal that most were in-service teachers, with support teachers forming the majority (64.07%). Concerning school level taught, most participants stated they teach in upper (31.96%) and lower (31.05%) secondary school levels. For details, see Table 1.

Table 1. Socio-demographic information

		N	%
Gender	Female	204	87.55
	Male	29	12.45
Age	20-29	26	11.16
	30-39	91	39.06
	40-49	84	36.05
	50-59	31	13.30
	60+	1	0.43
Graduate	No	51	21.89
	Yes	182	78.11
Role	Subject matter teacher	51	22.08
	Support teacher	148	64.07
	subject matter teacher + support teacher	7	3.03
	Not teach	13	5.63
	Other	12	5.19
Education level taught	Preschool	13	5.94
	Primary	63	28.77

Lower secondary	68	31.05
Upper secondary	70	31.96
Other	1	0.46
preschool + primary + lower secondary	1	0.46
preschool + other	1	0.46
lower secondary + upper secondary	2	0.91

Data Analysis

To address our research questions, we performed the following analyses using two tools: SPSS, released by IBM in 2019, and JASP, released in 2022. After carrying out preliminary analysis we explored whether any differences emerged in participants' perceptions of their individual competence and actions concerning technologies (RQ1) as measured before (T0) and after (T1) the online course. We also investigated pre-survey and post-survey differences between perceptions of (a) their use of technologies with students with Special Needs (RQ2) and (b) evaluation of different components of self-efficacy on the use of technologies, as measured by the ITIS scale (RQ3). To respond to RQ1, RQ2 and RQ3, we analysed the mean differences using participants' t-tests for paired samples. We also examined the effect sizes using Cohen's d. Based on benchmarks suggested by Cohen (1988), we interpreted the effect sizes as small (d = 0.2), medium (d = 0.5), or large (d = 0.8). When testing the relationship between teachers' self-efficacy on the use of technologies and the course delivery mode, sequential multiple regression analyses (stepwise method) were conducted to examine each self-efficacy subscale separately. Specifically, the dependent variables were the ITIS sub-scale scores (SE, INT, SEOE, SOE, POE) at T1, while the predictors were the six items related to course delivery, that is: (1) course usability in the absence of time constraints related to learning; (2) course usability in the absence of time constraints related to motivation; (3) course usability through employment of video lessons; (4) User-friendliness of ... internet navigation; (5) course

usability on a personal computer (PC); (6) course usability on a mobile device (for details, see supplementary materials; see also "Instruments" section). To control for the influence of teachers' self-efficacy before the online course (T0), the scores for the ITIS sub-scales in the pre-survey were used as covariates in the regression analyses (RQ4).

6. Results

Descriptive data (means and standard deviations) of participants' perception regarding their individual competence and actions concerning technologies, as revealed in the pre-survey and post-survey phases, are presented in Table 2. Concerning competence in the use of different technologies, t-tests revealed that all participants' scores in the pre-survey phase were significantly lower than their scores in the post-survey phase (all p<.001). Furthermore, the Cohen's d revealed a small effect for Skype (d = -0.298), Zoom (d = -0.320), Meet (d =-0.377), Teams (d = -0.352), Telegram (d = -0.345), and Signal (d = -0.457), while a medium effect was revealed for Dropbox (d = -0.505), Drive (d = -0.502), and TeamViewer (d = 0.563).

Regarding teachers' perception of their actions related to technologies, t-test results suggested that there are differences between the means in the pre-survey and post-survey phases concerning the ability to screen record (p<.001; d = 0.286), edit video (p<.001; d = 0.242), edit images (p<.001; d = 0.265), remotely manage the student PCs (p = 0.044; d = n.s.), create QR codes (p = 0.010; d = n.s.), read QR codes (p<.001; d = 0.285), respect copyright conditions (p<.001; d = 0.437), adopt open-source software (p<.001; d = 0.553), and set up workstations (p<.001; d = 0.296). This indicates that the course led teachers to perceive an improvement concerning some actions with technologies.

Table 2. *Descriptive statistics, t-test and effect size concerning technologies (competence in use and actions)*

	Time 0		Time 1					
	M	SD	M	SD	*T*	*df*	*p*	*d*
Competence in use								
Dropbox	2.728	1.413	3.308	1.213	-7.545	222	< .001	-.505
Drive	3.772	1.099	4.230	0.874	-7.612	229	< .001	-.502
Skype	3.637	1.219	3.952	1.029	-4.453	222	< .001	-.298
Zoom	3.442	1.270	3.790	1.177	-4.830	227	< .001	-.320
Meet	4.078	0.977	4.426	0.831	-5.709	228	< .001	-.377

Teams	4.130	0.890	4.437	0.743	-5.328	228	< .001	-.352
Telegram	2.699	1.519	3.065	1.474	-5.209	227	< .001	-.345
Signal	1.423	0.921	1.926	1.154	-6.745	217	< .001	-.457
TeamViewer	1.683	1.209	2.341	1.263	-8.332	218	< .001	-.563
Actions								
Record screen	1.378	0.754	1.638	0.814	4.297	225	< .001	.286
Edit video	1.704	0.871	1.926	0.760	3.639	226	< .001	.242
Send video	1.602	0.849	1.651	0.764	0.650	224	.516	.043
Edit audio	1.748	0.895	1.801	0.706	0.970	223	.333	.065
Edit image	1.096	0.417	1.263	0.628	4.008	228	< .001	.265
Create Website	1.978	0.417	2.009	0.553	0.354	225	.724	.024
Remotely manage student's PC	1.908	0.842	2.044	0.609	2.028	222	.044	.136
Create QR code	1.842	0.830	2.000	0.498	2.591	222	.010	.174
Read QR code	1.153	0.476	1.370	0.648	4.271	223	< .001	.285
Respect copyright	1.186	0.563	1.598	0.825	6.582	226	< .001	.437
Use open-source software	1.302	0.680	1.817	0.726	8.347	227	< .001	.553

EDIZIONI UNIVERSITARIE ROMANE
editoria scientifica dal 1952

Set up workstation	1.787	0.917	2.114	0.550	4.455	226	< .001	.296

Participants' t-tests were also performed to investigate changes in the teachers' perception of the use of technologies with children with Special Needs following their participation in the online course. The outcomes, shown in Table 3, revealed differences concerning the ability to (a) product an inclusive project, (b) use assistive technologies, (c) use ICT with children with specific learning disorders, and (d) use ICT with children with disabilities (all p<.0001). Cohen's d also revealed a small effect (ICT and specific learning disorders: d = 0.454) and medium effects (inclusive project: d = 0.728; assistive technologies: d = 0.606; ICT and disabilities: d = 0.710).

Table 3. *Descriptive statistics, t-test and effect size concerning inclusion*

	Time 0		Time 1					
	M	SD	M	SD	t	Df	*p*	*d*
Inclusive project	3.708	0.804	4.354	0.714	11.015	228	< .001	0.728
Assistive technologies	3.638	0.826	4.224	0.767	9.137	226	< .001	0.606
ICT and Specific Learning Disorders	3.772	0.829	4.227	0.744	6.860	227	< .001	0.454
ICT and Disabilities	3.742	0.837	4.422	0.730	10.764	229	< .001	0.710

Concerning self-efficacy (SE) in the use of technologies investigated with the ITIS scale, shown in Table 4, the means of participant scores are higher in Time 1 for SE and INT, but only SE is statistically significant (p <.001). Furthermore, the effect size shows that the online course generated a considerable effect for SE (d = -1.018).

Table 4. *Descriptive statistics, t-test and effect size concerning ITIS subscale*

		Time 0		Time 1					
ITIS Subscale	*N*	M	SD	M	SD	*t*	*df*	*p*	*d*
OE	233	34.31	5.16	33.93	5.68	1.319	232	0.188	.086
SE	233	18.54	4.60	22.41	3.58	-15.55	232	<.001	-1018
INT	233	24.65	3.33	24.72	3.16	-.41	232	.683	-.027

To investigate the role of the various online course delivery elements in accounting for the different components of the ITIS scale on the use of technologies, we performed a series of multiple linear regression analyses with the stepwise method (Table 5). Specifically, the multiple linear regression analyses with the self-efficacy measures at Time 1 as dependent variables and the course delivery indicators as predictors. Also, the SE measures at Time 0 were inserted as covariates. Table 5 shows the final full models with the significant predictors.

We analysed the score for the OE subscale of the ITIS survey at Time 1 as a dependent variable. We ran a regression analysis in which the score to the OE subscale of the ITIS survey at Time 0 was entered first and accounted for 26% of the total variance; all scores related to the delivery of course were entered subsequently with a stepwise method. This analysis showed that the usability of the course through video lessons contributed significantly to the OE subscale of the ITIS survey at Time 1; it also accounted for another 5% variance above and beyond the OE subscale of the ITIS survey at Time 0. In the final equation, the significant predictors were the OE subscale of the ITIS survey at Time 0 ($b = .46$, $p < .001$), and the usability of the course through video lessons ($b = .23$, $p < .001$).

We followed the same procedure for the subsequent scores for the subscales of the ITIS survey at Time 1. Regarding the score for the SE subscale of the ITIS survey at Time 1 as a dependent variable, finding that initially the SE subscale to the ITIS survey at Time 0 accounted for 34.7% of the total variance, and subsequently the usability of the course through video lessons and the usability of the course in the absence of time constraints related to the participation/motivation contributed significantly to the SE subscale of the ITIS survey at Time 1, together accounting for another 10% variance above and beyond the SE subscale of the ITIS survey at Time 0. In the final equation, the significant predictors were the SE subscale of the ITIS survey at Time 0 ($b = .53$, $p < .001$), the usability of the course through video lessons ($b = .27$, $p < .001$), and the usability of the course in the absence of time constraints related to the motivation/participation ($b = .13$, $p = .011$).

Finally, we analysed the score for the INT subscale of the ITIS survey at Time 1 as a dependent variable, finding that the score to the INT subscale of the ITIS survey at Time 0 was entered first and accounted for 48.1% of the total variance. Subsequent analysis showed that the usability of the course through video lessons and the usability of the course in the absence of time constraints related to participation/motivation contributed significantly to the INT subscale of the ITIS survey at Time 1, together accounting for another 4% variance above and beyond the INT subscale of the ITIS survey at Time 0. In the final equation, the significant predictors were the INT subscale of the ITIS survey at Time 0 ($b = .64$, $p < .001$), the usability of the course through video lessons ($b = .19$, $p < .001$), and the usability of the course in the absence of time constraints related to motivation ($b = .09$, $p = .047$).

Table 5. *Multiple linear regression analyses (stepwise method): final full models with significant predictor*

						Collinearity Statistics	
	Unstandardized	**Standard Error**	**Standardized**	**t**	**p**	**Tolerance**	**VIF**
DV: OE TIME 1							
Intercept	28.117	1.555		18.082	< .001		
OE Time 0	0.580	0.071	0.461	8.177	< .001	0.957	1.045
Usability of the course through video lessons	1.596	0.391	0.230	4.078	< .001	0.957	1.045
DV: SE TIME 1							
Intercept	8.505	1.120		7.597	< .001		
SE Time 0	0.412	0.039	0.526	10.425	< .001	0.957	1.044
Usability of the course through video lessons	1.216	0.232	0.269	5.241	< .001	0.925	1.081
Usability of the course in the absence of time constraints related to participation/motivation	0.433	0.169	0.129	2.559	0.011	0.955	1.047
DV: INT TIME 1							
Intercept	5.825	1.218		4.784	< .001		
INT Time 0	0.610	0.045	0.644	13.705	< .001	0.939	1.065
Usability of the course through video lessons	0.746	0.191	0.187	3.901	< .001	0.902	1.108
Usability of the course in the absence of time constraints related to the participation/motivation	0.274	0.138	0.093	1.994	0.047	0.958	1.044

5. Discussion

The study detailed in this paper aims to investigate the impact of the ICT-lab, which includes online video lessons, on enhancing the technological competence, computer self-efficacy, and technology utilization of participants, with a particular emphasis on students with SEND.

In relation to RQ1, the results show an increase, by the end of the course, relating to the participants' perceived technological skills and the actions that they state they can carry out. As regards the use of some technological applications, the results indicate perceived increased competence in using Dropbox, Drive and TeamViewer. It is possible that the other tools addressed (Zoom, Meet, Skype, Teams, Telegram, Signal), being mainly oriented towards communication, are those with which participants had greater competence even before the start of the course. In fact, they were the most commonly used tool during the COVID-19 pandemic (Gurung, 2021). As highlighted by several researchers, during COVID-19 distance learning replaced face-to-face teaching, with a prevalent use of tools oriented towards audio and video communication. Therefore, even if the course did not include direct training in use of these tools, it seems to have indirectly stimulated more frequent use and hence increased the perception of greater competence.

With regard to RQ2, the data show an increase in the perception of the effectiveness of the use of technologies in relation to producing inclusive projects, (b) using assistive technologies, (c) using ICT with children with specific learning needs, and (d) using ICT with children with disabilities. Furthermore, it is likely that the multiplicity of contents present in the nine different course modules allowed teachers to familiarize themselves with a whole range of technologies and inclusive teaching approaches. All this may have fostered greater awareness of their real applicability and replicability and of the inclusive role they play in the context of day-to-day teaching (Parmigiani et al., 2021; Bocchi & Bortolotti, 2023).

In regard to RQ3, only SE was found to be significant. Supported online video training seems to have afforded the teacher development of adequate and positive self-efficacy belief in the use of technologies. The structuring of supported online video training fostered development of technological skills which have made the teachers capable of performing some actions. Thanks to the use of videos, the subject-matter expert showed how something can be done by providing practical demonstrations (Asensio et al., 2006; Halls, 2012; Surgenor et al., 2017; Ou et al., 2019) and this was paired with exercises for teachers to gain practice (Sablić et al., 2020). Furthermore, teachers were supported in development of a multimedia product with the additional possibility of being able to compare their performance in a group, may have fostered the perception of greater effectiveness in the use of technologies.

As far as the OE and the INT are concerned, the results are not significant. It should be considered that the mean values of both OE and INT were high in the initial evaluation. It is therefore conceivable that the teachers had already had the opportunity, even before this specific course, to understand how educational technologies can be useful in the context of their profession and to develop an attitude of interest towards them.

As far as RQ4 is concerned, the results show that only two aspects related to course organization affected the constructs measured with the ITIS scale (SE, OE, INT). Specifically, (a) perception of the effectiveness of the use of videos impacts on

all three constructs, while (b) usability of the course in the absence of time constraints linked to participation/motivation impacts on SE and INT. The perception of the effectiveness of videos and the absence of time constraints for the use of the course, which impacted overall on the constructs evaluated with the ITIS scale, indicate how supported online video training could support a training model oriented towards the development of efficacy beliefs (Bandura, 1996). These training models support action strategies useful for achieving good performance both through the passage of explanatory and demonstrative information. All this is in line with the literature, where it is clear that video lessons can be used to show how something can be done by providing practical demonstrations (Asensio et al., 2006; Halls, 2012; Surgenor et al., 2017) of things that would be difficult to explain with images and text alone (Colasante, 2011; Sherin & Van Es, 2008; Zhang et al., 2006).

Furthermore, the study was conducted in an on-the-job training context where teachers are professionally engaged (Li et al., 2022). The absence of time constraints offers them a training context where they can dedicate increasing leisure time to learning but also to develop curiosity and interest. This would explain why the organization of the course had a positive impact on the participants' SE and INT.

6. Implications for future research and practice

Appropriate use of technologies can facilitate learning, autonomy and communication when seeking to meet special educational needs but can also generate improvement in basic skills and capacities related to social interaction (Benigno et al., 2019). This polyvalence of roles can foster the development of education oriented towards "special normality" (Ianes, 2005) in that it facilitates the achievement of autonomy in the organisation of study and independence in production, provided that the technologies employed embody characteristics of accessibility and usability (Chiappini et al., 2004; Caruso & Ferlino, 2009; Besio et al., 2008; Dini et al., 2004).

Therefore it becomes necessary to offer teachers training courses that are able to promote interest and skills in the use of ICT.

The adoption of online video-supported training was beneficial for the development of teachers' technological skills and computer self-efficacy. Computer Self Efficacy (CSE) can be considered one of the main factors facilitating/inhibiting integration of technology in teaching practice. Its evaluation should become standard practice to foster awareness processes both on the part of teachers but also of those involved in teacher training (Benigno et al., 2014). By using videos to showcase hands-on demonstrations and providing opportunities for hands-on practice, teachers can learn more effectively and apply their knowledge directly in their teaching practice. The self-paced nature of online video training further enhances the learning experience by allowing teachers to tailor learning to their individual needs and preferences. In addition, online video training materials could remain at the disposal of participants even after their specialization, acquiring the function of Open Online Resource for teachers' lifelong learning.

Furthermore, the study suggests that the developed approach can be easily applied to a wider range of teacher education and professional development initiatives. Based on these results, we can also offer practical input to educational researchers for deepening their studies, and also support the work of different educational stakeholders involved in implementing teacher training interventions in conjunction with Italy's Ministry of Education.

7. Limitations and Further Research

Three major limitations of this study should be noted. The first concerns the sample. The study involved a sample from a specific Italian Region (Liguria) and this may have affected the generalizability of results. Hence, these should be interpreted with caution and future research is needed with a larger sample that includes teachers from different Italian Regions so as to confirm and validate the current findings. Furthermore, we did not include a control group. Further research is needed to compare control and treatment groups. Finally, the third limitation concerns the tools used in the pre- and post-phases. Specifically, we relied on questionnaires that captured the perception of teachers, a factor that could be influenced by social desirability. Future research might also test the effects of the training by administering direct tests before and after the training course.

Informed Consent Statement:
Informed consent was obtained from all subjects involved in the study.
This study was conducted according to the ethical guidelines of the Italian Psychological Association. Ethical review and approval were waived for this study because it did not fall into the categories that, according to the current regulations of our institutions, require explicit approval of an ethical committee.

Declaration of Conflicting Interests
The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding
The present research was performed in the context of support teacher training funded by the University of Genoa.

Acknowledgments:
The authors express special thanks to Jeffrey Earp for language revision.

References

Andresen, M. A. (2009). Asynchronous discussion forums: success factors, outcomes, assessments, and limitations. *Educational Technology & Society, 12*(1), 249–257, ISSN-1436-4522.

Asensio, M., Brown, F., Cuttle, M., Young, C., Little, R., Bijnens, M., & Verheij, G. J. (2006). *Handbook on digital video and audio in education creating and using audio and video material for educational purposes.* VideoAktiv. https://elbd.sites.uu.nl/wpcontent/uploads/sites/108/2017/05/2184_9_VideoAktivHandbookfin.pdf

Bandura, A. (1986). Fearful expectations and avoidant actions as coeffects of perceived self-inefficacy. *American Psychologist, 41*(12), 1389–1391. https://doi.org/10.1037/0003-066x.41.12.1389

Bellocchi, A., Mills, K. A., & Ritchie, S. M. (2016). Emotional experiences of preservice science teachers in online learning: The formation, disruption and maintenance of social bonds. *Cultural Studies of Science Education, 11*(3), 629-652. https://doi.org/10.1007/s11422-015-9673-9

Bembich, C. (2015). Uso delle tecnologie nel sostegno: il punto di vista di un gruppo di insegnanti in formazione. *Form@Re : Open Journal per La Formazione in Rete, 15*(2), 47–60. https://doi.org/10.13128/formare-17061

Benigno, V., Chiorri, C., Chifari, A., & Manca, S. (2013). Italian adaptation of the Intrapersonal Technology Integration Scale, a measure of teachers' attitudes towards Information and Communication Technology (ICT). Giornale Italiano Di Psicologia, 4, 815–838. https://doi.org/10.1421/76948

Benigno, V., Chifari, A., & Chiorri, C. (2014). Adottare le tecnologie a scuola: una scala per rilevare gli atteggiamenti e le credenze degli insegnanti. Italian Journal of Educational Technology, 22(1), 59-62.

Benigno V., Ferlino L., Trentin G. (2019). Tecnologie abilitanti. Un nuovo paradigma per l'inclusione, Quaderno "Inclusione a 360°. Equità e valorizzazione dei talenti", 113-126, Pearson, Editore, Milano.

Besio, S., Ferlino, L., Laudanna, E., Occhionero, F., & Potenza, F. (2008). Accessibility of educational software: from evaluation to design guidelines. Computer Helping People with Special Needs, Academic Press, 518-525. https://doi.org/10.1007/978-3-540-70540-6_74

Bocchi, B. B., & Bortolotti, E. (2023). Teacher training between inclusive education and ict. *Italian Journal of Health Education, Sport and Inclusive Didactics, 7*(1). https://doi.org/10.32043/gsd.v7i1.818

Bocconi, S., Panesi, S., & Kampylis, P. (2020). Fostering the digital competence of schools: piloting SELFIE in the Italian education context. IEEE Revista Iberoamericana de Tecnologias del Aprendizaje, 15(4), 417-425. doi: 10.1109/RITA.2020.3033228

Bocconi, S., Panesi, S. (2018). Teachers' professional learning and competence in the digital era: the DigCompEdu framework. in M. Ranieri, L. Menichetti, M.K. Borges, Teacher Education & Training on ICT between Europe and Latin America, 39-48. Canterano: Aracne Editrice.

Bonwell, C. C., & Eison, J. A. (1991). *Active learning: Creating excitement in the classroom.* George Washington University. https://files.eric.ed.gov/fulltext/ED336049.pdf

Caruso, G., & Ferlino, L. (2009). Accessibility of Educational Software: A Problem Still to Be Solved. HCI and Usability for e-Inclusion, 193-198. doi: 10.1007/978-3-642-10308-7_13

Chiappini, G., Dini, S., & Ferlino, L. (2004). Tecnologie didattiche e disabilità. In D. Parmigiani (Ed.), Tecnologie per la didattica. Dai fondamenti dell'antropologia multimediale all'azione educativa, 233-248. Milano, Franco Angeli.

Chifari A., Ottaviano S., D'Amico A. & Cardaci M. (2000). Studying the teachers' self-efficacy beliefs towards computers. University as a bridge from Technology to Society. In *IEEE International Symposium on Technology and Society*, (pp. 33-34). https://doi.org/10.1109/ISTAS.2000.915574

Coban, O., & Atasoy, R. (2019). An examination of relationship between teachers' self-efficacy perception on ICT and their attitude towards ICT usage in the classroom. *Cypriot Journal of Educational Sciences, 14*(1), 136-145. https://doi.org/10.18844/cjes.v14i1.3636

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences.* (2nd Ed.) Routledge. https://doi.org/10.4324/9780203771587

Colasante, M. (2011). Using video annotation to reflect on and evaluate physical education pre-service teaching practice. *Australasian Journal of Educational Technology*, *27*(1). https://doi.org/10.14742/ajet.983

Compeau, D., & Higgins, C. (1995). Computer Self-Efficacy: development of a measure and initial test. *Management Information Systems Quarterly*, *19*(2), 189. https://doi.org/10.2307/249688

Dalal, M. (2014). Impact of Multi-media Tutorials in a Computer Science Laboratory Course - An Empirical Study. *Electronic Journal of e-Learning, 12*(4), 366–374. http://files.eric.ed.gov/fulltext/EJ1035651.pdf

De Angelis, M. (2021). Evaluating inclusive teacher competences: a systematic review within the training courses for special education specialization in Italy. *Form@re - Open Journal Per La Formazione in Rete*, *21*(1), 253–269. https://doi.org/10.13128/form-10417

Dini, S., Ferlino, L., Martinoli, C. (2004). Usability of Educational Software for Visual Impairment: A Question of Viewpoint. Computers Helping People with Special Needs, 3118. Berlin, Heidelberg. https://doi.org/10.1007/978-3-540-27817-7_84

Fedeli, L. (2022). A cross-case analysis of ICT courses in teacher training programmes for special needs: Technology affordances and Universal Design for Learning. *Education Sciences and Society, 2*, 59–71. https://doi.org/10.3280/ess2-2022oa14076

Fedeli, L., & Pennazio, V. (2022). An exploratory study on teacher training. In *IGI Global eBooks* (pp. 1037–1059). https://doi.org/10.4018/978-1-6684-3670-7.ch056

Fouad, N. A., Smith, P. L., & Enochs, L. G. (1997). Reliability and Validity Evidence for the Middle School Self-Efficacy Scale. *Measurement and Evaluation in Counseling and Development*, *30*(1), 17–31. https://doi.org/10.1080/07481756.1997.12068914

GDPR, (2016). Official Journal of the European Union, L 119, 4.5.2016, 1-88. https://eur-lex.europa.eu/eli/reg/2016/679/oj

Gurung, R. A. R. (2021). Inspire to learn and be CCOMFE doing it. *Canadian Psychology*, *62*(4), 348–351. https://doi.org/10.1037/cap0000277

Halls, J. (2012). *Rapid video development for trainers: How to create learning videos fast and affordably.* American Society for Training & Development.

Hart, C. (2012). Factors associated with student persistence in an online program of study: A review of the literature. *Journal of Interactive Online Learning*, *11*(1), 19–42. https://www.ncolr.org/jiol/issues/pdf/11.1.2.pdf

Hoerger, M., & Currell, C. (2012). Ethical issues in Internet research. In *American Psychological Association eBooks* (pp. 385–400). https://doi.org/10.1037/13272-018

Ianes, D. (2014). *L'evoluzione dell'insegnante di sostegno.* Erickson.

IBM Corp. Released 2019. IBM SPSS Statistics for Windows, Version 26.0. Armonk, NY: IBM Corp.

JASP Team (2022). JASP (Version 0.16.2) [Computer software].

Kay, R. (2012). Exploring the use of video podcasts in education: A comprehensive review of the literature. *Computers in Human Behavior*, *28*(3), 820–831. https://doi.org/10.1016/j.chb.2012.01.011

Kim, D., Yoon, M., Jo, I. H., & Branch, R. M. (2018). Learning analytics to support self-regulated learning in asynchronous online courses: A case study at a women's university in South Korea. *Computers & Education*, *127*, 233–251. https://doi.org/10.1016/j.compedu.2018.08.023

Lent, R. W., Sheu, H. B., Singley, D., Schmidt, J. A., Schmidt, L. C., & Gloster, C. S. (2008). Longitudinal relations of self-efficacy to outcome expectations, interests, and major choice goals in engineering students. *Journal of Vocational Behavior, 73*(2), 328-335. https://doi.org/10.1016/j.jvb.2008.07.005

Lent, R. W., Brown, S. D., & Hackett, G. (1994). Toward a unifying social cognitive theory of career and academic interest, choice, and performance. *Journal of Vocational Behavior*, *45*(1), 79–122. https://doi.org/10.1006/jvbe.1994.1027

Li, R., Liu, H., Chen, Y., & Yao, M. (2019). Teacher engagement and self-efficacy: The mediating role of continuing professional development and moderating role of teaching experience. *Current Psychology*, *41*(1), 328–337. https://doi.org/10.1007/s12144-019-00575-5

Marakas, G. M., Aguirre-Urreta, M. I., Shoja, A., Kim, E. Y., & Wang, S. (2022). The Computer Self-Efficacy Construct: A History of Application in Information Systems Research. *Foundations and Trends® in Information Systems*, *6*(2), 94–170. https://doi.org/10.1561/2900000023

Merrill, M. (2002). First principles of instruction. *Educational Technology Research and Development*, *50*(3), 43–59. https://doi.org/10.1007/bf02505024

Moody, J. D. (2004). Distance education: Why are the attrition rates so high? *Quarterly Review of Distance Education*, *5*(3), 205–210. https://eric.ed.gov/?id=EJ874960

Niederhauser, D. S., & Perkmen, S. (2008). Validation of the Intrapersonal Technology Integration Scale: Assessing the Influence of Intrapersonal Factors that Influence Technology Integration. *Computers in the Schools*, *25*(1–2), 98–111. https://doi.org/10.1080/07380560802157956

Niederhauser, D. S., & Perkmen, S. (2010). Beyond self-efficacy: Measuring pre-service teachers' Instructional Technology Outcome Expectations. *Computers in Human Behavior*, *26*(3), 436–442. https://doi.org/10.1016/j.chb.2009.12.002

OECD (2023) Education at a Glance 2023: OECD Indicators, OECD Publishing, Paris. https://www.oecd.org/education/education-at-a-glance/

Ou, C., Joyner, D., & Goel, A. K. (2019). Designing and Developing Videos for Online Learning: a Seven-Principle model. *Online Learning*, *23*(2), 82-104. https://doi.org/10.24059/olj.v23i2.1449

Pajares, F. (2002). Gender and Perceived Self-Efficacy in Self-Regulated learning. *Theory Into Practice*, *41*(2), 116–125. https://doi.org/10.1207/s15430421tip4102_8

Pappas, I. O., Giannakos, M. N., & Mikalef, P. (2017). Investigating students' use and adoption of with-video assignments: lessons learnt for video-based open educational resources. *Journal of Computing in Higher Education*, *29*(1), 160–177. https://doi.org/10.1007/s12528-017-9132-6

Parmigiani, D., Benigno, V., Giusto, M., Silvaggio, C., & Sperandio, S. (2021). E-inclusion: online special education in Italy during the Covid-19 pandemic. Technology, Pedagogy and Education, 30(1), 111-124.

Pinnelli, S., & Fiorucci, A. (2020). Valutazione della componente tecnologica per la promozione dell'inclusione. Un'esperienza di ricerca-azione su base index rivolta a docenti di sostegno in formazione. *MeTis*. https://doi.org/10.30557/mt00122

Prince, M. J. (2004). Does active learning work? A review of the research. *Journal of Engineering Education*, *93*(3), 223–231. https://doi.org/10.1002/j.2168-9830.2004.tb00809.x

Ramos, J. L., Cattaneo, A. A., de Jong, F. P., & Espadeiro, R. G. (2022). Pedagogical models for the facilitation of teacher professional development via video-supported collaborative learning. A review of the state of the art. *Journal of Research on Technology in Education*, *54*(5), 695-718. https://doi.org/10.1080/15391523.2021.1911720

Rismark, M., & Sølvberg, A. M. (2019). Video as a learner scaffolding tool. *International Journal of Learning, Teaching and Educational Research*, *18*(1), 62–75. https://doi.org/10.26803/ijlter.18.1.5

Rook, M. M., & McDonald, S. P. (2012). Digital records of practice: A Literature review of video analysis in teacher practice. In *Society for Information Technology & Teacher Education International Conference* (pp. 1441–1446). AACE.

Sablić, M., Mirosavljević, A., & Škugor, A. (2020). Video-Based Learning (VBL)—Past, Present and Future: an Overview of the Research Published from 2008 to 2019. *Technology, Knowledge, and Learning*, *26*(4), 1061–1077. https://doi.org/10.1007/s10758-020-09455-5

Schunk, D. H. (2000). *Learning theories: An educational perspective* (3rd ed.). Upper Saddle River.

Sherin, M. G., & Van Es, E. A. (2008). Effects of video club participation on teachers' professional vision. *Journal of Teacher Education*, *60*(1), 20–37. https://doi.org/10.1177/0022487108328155

Stewart, M., Stott, T., & Nuttall, A. (2011). Student Engagement Patterns over the Duration of Level 1 and Level 3 Geography Modules: Influences on Student Attendance, Performance and Use of Online Resources. *Journal of Geography in Higher Education*, *35*(1), 47–65. https://doi.org/10.1080/03098265.2010.498880

Surgenor, D., Hollywood, L., Furey, S., Lavelle, F., McGowan, L., Spence, M., Raats, M. M., McCloat, A., Mooney, E., Caraher, M., & Dean, M. (2017). The impact of video technology on learning: A cooking skills experiment. *Appetite*, *114*, 306–312. https://doi.org/10.1016/j.appet.2017.03.037

Turan, Z., & Çetintaş, H. B. (2019). Investigating university students' adoption of video lessons. *Open Learning: The Journal of Open and Distance Learning*, *35*(2), 122–139. https://doi.org/10.1080/02680513.2019.1691518

Wang, Y., Liu, C., & Tu, Y. F. (2021). Factors affecting the adoption of AI-based applications in higher education: an analysis of teachers perspectives using structural equation modeling. *Educational Technology & Society*, *24*(3), 116-129. https://www.jstor.org/stable/27032860

Watson, S. L. (2017). Facilitating attitudinal learning in an animal behaviour and welfare MOOC. *Open Learning: The Journal of Open and Distance Learning*, *32*(3), 262–278. https://doi.org/10.1080/02680513.2017.1357465

Wood, R. E., & Bandura, A. (1989). Social Cognitive Theory of Organizational Management. *Academy of Management Review*, *14*(3), 361–384. https://doi.org/10.5465/amr.1989.4279067

Yeşilyurt, E., Ulaş, A. H., & Akan, D. (2016). Teacher self-efficacy, academic self-efficacy, and computer self-efficacy as predictors of attitude toward applying computer-supported education. *Computers in Human Behavior*, *64*, 591–601. https://doi.org/10.1016/j.chb.2016.07.038

Zhang, D., Zhou, L., Briggs, R. O., & Nunamaker, J. F. (2006). Instructional video in e-learning: Assessing the impact of interactive video on learning effectiveness. *Information & Management*, *43*(1), 15–27. https://doi.org/10.1016/j.im.2005.01.004.

Supplementary materials

Topic	**Brief description**	**Objectives (knowledge and competences)**	**Task and feedback**
Online resources for inclusion	Presentation of 3 institutional sites related to documentation services (Essediquadro, Siva Portal, Sharehab)	Becoming familiar with some online information services (*knowledge).* Knowing how to search for resources/navigate the presented sites (*competences)*	4 individual tests (with automatic feedback on correctness) on the content presented (3 cloze, 1 name/image matching) + individual description of a digital resource
Digital Storytelling	Presentation of the Digital Storytelling methodology; description of the	Becoming familiar with the Digital Storytelling methodology (*knowledge).* Knowing how to develop a	6 individual tests (with automatic feedback on correctness) on the proposed content (multiple choice quiz); develop a learning unit centred

	operational steps and tools needed to carry out a DS activity in the classroom	learning unit centred on the DS (*competences)*	on Digital Storytelling (group discussion with collaborative work; feedback and evaluation)
OER for inclusion	Presentation of OER for the production of teaching materials; free software for teaching; FLOSS resources for schools; proposals for inclusive set-ups	Familiarising with free software for teaching and with resources for producing materials (*knowledge).* Knowing how to recognise free software and to integrate it into a learning scenario, knowing how to create material with the tools presented... (*competences)*	4 individual tests (with automatic feedback on correctness) on the proposed contents (2 clozes, 1 name/image matching, 1 image selection of elements necessary for an inclusive set up); + individual use of a database to locate suitable resources; + individual description of free resources (with feedback and evaluation)
The Hybrid Class	Presentation of the "Hybrid Class" model, tested in the context of the TRIS project (Network Technologies for Socio-educational Inclusion).	Familiarisation with the core characteristics of the hybrid class (*knowledge).* Knowing how to develop a teaching activity that takes into account attributes concerning the technologies, organisation and design of the hybrid classroom (*competences).*	1 individual test (with automatic feedback on correctness) on the proposed content (1 Memory); individual design of a teaching activity involving one or more distance learners (with feedback and evaluation)
Compensatory tools for SLDs	Presentation of compensatory tools for reading, writing and studying, aimed at examining the potential of these resources for learning and integration.	Familiarisation with compensatory tools (*knowledge).* Recognising the potential of such tools (*competences)*	Individual analysis of software through its use and completion of a questionnaire on the software used (with feedback)
Block programming	Introduction to Coding and Computational	Getting to know coding and computational thinking (*knowledge).*	Individual/group creation of () a product with Scratch (with feedback)

	Thinking. Reflection on use in the support context. Presentation of some tools to carry out coding activities and practise computational thinking.	Recognising the potential of the tools presented and knowing how to develop a product with one of them (*competences).*	
Educational robotics	Introducing educational robotics as a tool for creating inclusive teaching opportunities	Familiarisation with educational robotics (*knowledge).* Knowing how to create a learning scenario involving the use of educational robotics, in an inclusive perspective, with one of the resources presented (*competences*).	Individual/group design of a learning scenario involving the use of educational robotics, taking into account the resources available and the educational needs of the learners (with feedback)
Personalizing educational software	Presentation on personalizing educational software and the choice of resources	Familiarisation with customizing educational software, and with the concept of accessibility (*knowledge*). Knowing how to recognise the potential of customisable resources, knowing how to adapt software to user needs in order to facilitate learning (*competences*).	Individual analysis of software through its use and completion of a questionnaire on the software used (with feedback)
Augmented Reality	Presentation of Augmented Reality and its applicability in the context of teaching disabled students.	Familiarisation with Augmented Reality and tools for educational use (*knowledge*). Knowing how to create an Augmented Reality project (*competences*)	Creating an individual/group project with Metaverse (with feedback)