



**Proceedings of the 2nd International
Conference**

of the Journal Scuola Democratica

REINVENTING EDUCATION

VOLUME II

**Learning with New Technologies,
Equality and Inclusion**

**ASSOCIAZIONE "PER SCUOLA
DEMOCRATICA"**

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International Conference
of the Journal Scuola
Democratica**
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**Learning with New
Technologies, Equality
and Inclusion**

ASSOCIAZIONE “PER SCUOLA DEMOCRATICA”
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***Title* Proceedings of the Second International Conference of the Journal “Scuola Democratica” – Reinventing Education VOLUME II Learning with New Technologies, Equality and Inclusion**

This volume contains papers presented in the First International Conference of the Journal “Scuola Democratica” which took place at the University of Cagliari on 5-8 June 2019. The aim of the Conference was to bring together researchers, decision makers and educators from all around the world to investigate the concepts of “education” in a “post-democracy” era, the latter being a set of conditions under which scholars are called to face and counteract new forms of authoritarian democracy.

Populisms, racisms, discriminations and nationalisms have burst and spread on the international scene, translated and mobilized by sovereigntist political movements. Nourished by neo-liberalism and inflated by technocratic systems of governance these regressive forms of post-democracy are shaping historical challenges to the realms of education and culture: it is on this ground, and not only on the political and economic spheres, that decisive issues are at stake. These challenges are both tangible and intangible, and call into question the modern ideas of justice, equality and democracy, throughout four key dimensions of the educational function, all of which intersected by antinomies and uncertainties: ethical-political socialization, differences, inclusion, innovation.

The Conference has been an opportunity to present and discuss empirical and theoretical works from a variety of disciplines and fields covering education and thus promoting a trans- and inter-disciplinary discussion on urgent topics; to foster debates among experts and professionals; to diffuse research findings all over international scientific networks and practitioners’ mainstreams; to launch further strategies and networking alliances on local, national and international scale; to provide a new space for debate and evidences to educational policies. In this framework, more than 600 participants, including academics, educators, university students, had the opportunity to engage in a productive and fruitful dialogue based on researches, analyses and critics, most of which have been published in this volume in their full version.

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weaknesses of youth policies at both a national and supranational level.

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Reinventing the Digital Literacy of Teachers After COVID-19 Pandemic

Effect of Online Training on Teachers' Technological Knowledge. The Concept of E-Learning

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ABSTRACT: *The paper describes a study conducted during a training intervention aimed at secondary school teachers on the subject of digital skills. This theme has been a central topic in Europe for many years, amplified and made more urgent by the COVID-19 epidemic which has transformed traditional teaching into distance learning (DAD). The study was created with the aim of reflecting on teaching practices and their models, in particular on the epistemological paradigms that guide secondary school teachers in the use of educational technologies. The assumption is that technologies, if used according to methodologies based on scientific evidence and pedagogically oriented, can make a contribution to distance teaching and learning processes. The aim of the study was to know the impact of the training intervention on the technological knowledge of the teachers involved through the administration of two questionnaires, pre and post intervention. The analysis highlighted some misconceptions regarding e-learning that seem more related to the degree held than to the type of in-service training received.*

KEYWORDS: *E-learning, e-tivity, instructional video, instructional design, teaching training.*

Introduction

In today's digital society, teachers need to integrate ICT into their daily teaching practice. Therefore countries should ensure ICT training as a mandatory component of all initial teacher education programs. The OECD analysis (Reimers et al., 2020) highlighted how teachers' professional development must involve both technological and instructional and learning design skills.

Faced with the standardization process of technologies in schools, due to the COVID-19 epidemic, we must think of an educational model with a strong epistemological impact capable of optimizing the learning potential and minimizing critical elements. This calls into question the skills of the teacher who must be able to put into practice the indications coming from educational and pedagogical research, in terms of technologies, if he wants to become within the new learning environment

(classroom and virtual classroom) the real protagonist of the change. If this does not happen, if the teacher continues to 'move' the frontal lesson into this multimedia environment without the necessary redesign process, there is a risk of impoverishing the teaching.

1. The state of the art

Since the 1980s in Italy, numerous projects have taken place in schools to introduce what is now called didactics 2.0 and substantial resources have been invested in teacher training and to set up new learning environments. But the didactic potential of learning technologies according to scientific evidence emerged only occasionally (Calvani, 2007; Laurillard, 2008; Ranieri, 2011).

There seem to be three important aspects, integrated with each other, to consider in teacher training in this area: the concept of e-learning and related tools (methodological), the production of multimedia cognitive artefacts like audiovisual texts (technological-linguistic), the forms of active and participatory learning like e-tivity (didactic).

E-learning

The consideration regarding the specific didactic dimension (Ranieri, 2005; Anderson, 2011), which would only be partially addressed, still applies today with reference to training on e-learning. Such didactic dimension is strictly connected to the elaboration of e-learning design process models and would concern both macrostructure and microstructure levels: on the one hand, virtuality-presence integration, the management of delocalized spatialities and variable temporalities (Lazzari, 2017), on the other the evaluation/choice/adaptation of didactic strategies.

The emergency adaptation of courses and teaching activities remotely, which was tested during the COVID-19 pandemic, has brought this aspect to light (Reimers, Schleicher, 2020). As highlighted by the UN (UN, 2020) «digital solutions need relevant content, adequate teaching models, effective teaching practices and a supportive learning environment». The limit identified in this situation, in fact, would not have been so much in the lack of support offered by teachers to students – in terms of the 'teacher-student' relationship –, but rather in the lack of connection between the pedagogical contents and differentiated learning environments, through digital technologies and the organization of learning experiences – on the level, therefore, of the 'teacher-course' relationship –, which would concern both the design of the didactic design (ID) and the choice of the learning design (LD) (Bates, 2019; Goodyear, 2015).

For this reason, the technological training of teachers in the pandemic phase, in addition to recovering mere access skills, had to invest in teaching-learning skills (planning, implementation and management of

resources; guidance and support) to better facilitate the learning processes of the students (see Area 3, DigCompEdu – Redecker, 2017). It was thus possible to facilitate the transition from teaching 'with' technologies (technologies as a tool) to teaching 'through' technologies (technologies as a learning environment) (Rivoltella, 2017).

Video-based learning

The didactic video or video-based learning is focused on methodological aspects on the principles of knowledge construction through cognitive artefacts based on visual / audiovisual / audio / multimedia languages and network technologies, used with the aim of making learning processes meaningful. These texts can be used to integrate or replace part of teaching, in the construction of factual, conceptual, procedural or metacognitive knowledge. Both television texts (today a minority) and videos fall within this broad definition, categorized according to procedures and terminologies that are still not standardized at international level, each with functional characteristics for different types of knowledge: ad hoc recorded video lessons video lessons such as capture of the classroom lesson, multimedia presentations (such as Powerpoint) with voice over, screencast, live lessons in web conferences, educational videos, educational television programs, knowledge clips, etc. Of course, the list is not representative of all the existing forms, and the contamination between the texts cited appears in common use (Ganino, 2018).

The study of these texts, used in the representation of factual, conceptual, procedural or metacognitive knowledge, in all subject areas, is not a new phenomenon, but in recent years with the spread of new didactic methods, flipped, blended, MOOCs, there has been a renewed interest in this technology. Not to mention the COVID-19 emergency, which led to the use of audiovisual text as the main teaching medium. For this reason it appears useful to identify scientific evidence relating to the new design guidelines of these important educational resources.

Numerous studies show how video can be effective in training processes if the rules of Instructional design are respected: correct management of the cognitive load, enhancement of theories on multimedia learning, promotion of student involvement and active learning. All these points, especially the first two, are widely treated on a scientific level, but still do not find effective application in teaching practices, based on random or instrumental choices relating to the use of these resources (Sweller et al., 2019).

More specifically, it is clear that audiovisual texts can have a significant impact on learning if they are made on the basis of specific theoretical paradigms that constrain their use. The studies on the design of the educational audiovisual text are particularly interesting: the significant role of the integrated camera point of view, objective and subjective, in the context of learning complex manual procedures; new design elements relating to the ways of representing the teacher, his presence

or absence, as well as his communicative attitude; the increasingly close relationship between educational sciences and neuroscience, in reference to the progress of the theory on cognitive load which led to the identification of new principles useful for didactic planning, and to the support of subjective measurement techniques of cognitive load with techniques objective able to evaluate in authentic learning situations the role of different electrical frequencies, through EEG, on cognitive processes.

e-tivity

The term etivity was coined by Gilly Salmon, Director of Online Education Services in Australia and Lecturer at the University of Liverpool Management School. The author defines an etivity as a framework that allows active and participatory learning, individually and in groups (Salmon, 2013). The concept of etivity is connected to meta-learning because the student does not limit to absorb notions, but builds his path actively, through the teacher mediation, and he acquires cognitive and behavioral strategies, prerequisites necessary for meaningful and effective learning (Salmon, 2011).

In general, a teacher who designs and uses etivities in a virtual learning environment can optimize time management, he can increase the engagement and consolidate the information learned. The teacher can build an evolutionary didactic design, guaranteeing scaffolding and peer tutoring. Especially if the teacher uses a multi-instrumental platform, he can check the progress of each individual student, moderate group work and create a circular virtual setting, practicing the principles of collaborative learning.

Through the etivities, the teacher stimulates problem-based learning, providing the student with problem solving and metacognition tools, encourages discovery learning and concrete experiences.

By working in an online group, the student learns to value his resources and to compare with peers, implementing strategies to contain the feelings of competence (positive and negative) and relational dynamics. Finally, through the focus on work, the learner focuses on processes and the teacher provides feedback, motivating critical sense and self-regulation. In this perspective, designing an etivity is a challenge for the teacher who must immerse himself in a technological system that redesigns the educational relationship.

The teacher must reshape the teaching-learning process according to a potentially distant and distracted student. To achieve these goals and overcome these difficulties, according to Gilly Salmon, to design an etivity it is necessary to prospect six elements: a spark, the challenge or problem to be solved; an activity/task to be performed; a tool that guarantees the participation and control of the student; a moderator who invites to participate, provides instructions, regulates and coordinates; a system of circularity and reciprocity of feedback and a final phase of metacognition and transcendence (Salmon, 2014).

During the learning path, for each micro-unit, it is advisable to foresee one or more activities, with the aim of assessing the know-how of learners, placed in a complex and motivating situation. In this sense, the activity becomes an opportunity for cognitive growth and practical involvement.

2. The working methodology

2.1. The context

The project involved the training of teachers of a secondary school with a technological focus, in Benevento (in Campania, Italy). The theme of the training was distance learning on a methodological and technological level. The course, held between September and November 2020, was carried out remotely, according to a dual modality:

- a – partly asynchronous (dedicated to conceptual knowledge through the use of video lessons, educational videos, OER, forums, e-activity)
- b – and partly synchronous through the use of web conferencing tools (dedicated to in-depth analysis and clarification of the topics addressed in asynchronous mode, to collective discussions and reflections).

The training course was designed and organized considering the following principle as a theoretical framework: the enhancement of content and the teaching relationship, through the appropriate use of e-learning tools and methodologies, improves learning processes.

2.2. The purpose

The purpose of the study was to verify the effects of the training intervention:

- a) on the acquired knowledge
- b) on skills (therefore on the educational practices resulting from the intervention). This second part will take place through a subsequent experimentation scheduled for the period September-December 2021. It is therefore not considered in this article.

2.3. Methods and tools

The learning was verified through:

- a) The administration of questionnaires, pre and post intervention: an entry questionnaire (pre_test_01) to verify the pre-requisites of the teachers; an exit questionnaire (post-test_02) to verify the acquired knowledge.
- b) The acquired knowledge was correlated with some personal characteristics of the teachers and their previous experiences (identified during the administration of the pre_test_01).

The reference model for studying the effects on teacher training is the Kirkpatrick model (1959; and Kirkpatrick, 2006) which identifies the known four levels: reaction, learning, behavior, results.

- Reaction. Assess the teachers' response, in particular, how they felt about the training.
- Learning. Defines the effectiveness with which the information has been learned by the teachers – the skills assessment, specifically, can be carried out through the analysis of artefacts after sharing a scale on the quality levels of the same.
- Behaviors. Describes the degree to which the training has influenced the behavior of the participants and how they are applying their new knowledge to their work.
- Results. Measures the impact that the training has had at the school level, how it contributes to the success of the organization as a whole but also offers evidence for monitoring the training program itself.

The Hamtini model was chosen from it (Hamtini, 2008, 697), adapted to the e-learning delivery environment, which replaces four with three (interaction, learning, results) levels:

- Interaction. Defined as how the learners is able to use the learning environment and to achieve the learning outcomes. It examines whether the e-learning user was able to use the interface to learn the necessary information.
- Learning. Defined as the increase in knowledge as a direct result of having engaged in the e-learning activity. This level assesses whether the people involved have learned the material they should have learned after the e-learning module and whether the net change in knowledge is the direct result of having attended the course.
- Results. Seen as an examination of the outcome of the e-learning experience; it examines the efficacy of the e-learning module, the teachers involved ability to concretely apply the theoretical knowledge acquired.

Specifically, the study focused on level 2 of learning, defined based on the modification of focus knowledge and detected through the pre-post double administration of the 'ad hoc' questionnaire.

2.4. Preparation of questionnaires

In compliance with the validity and reliability criteria, the questionnaires, both with multiple choice, were prepared on the basis of some parameters:

- definition of a clear research question and of the didactic objectives to be verified;
- use of understandable language, with terms known to the sample, no use of negative sentences or double negatives (disambiguation). This is in order to verify the ability of the sample to answer and not his ability to understand the question;
- identification of a scale for measuring responses (evaluation grids);

- carrying out a pre-test by administering the questionnaires to a sample similar to the subjects of our study (to teachers from a different school) and subsequent revision of the questionnaires.

The questions were divided into 4 areas:

- sociometric-professional data;
- knowledge of distance learning and e-learning environments;
- conceptual and methodological knowledge of audiovisual texts (web conference, videolesson, didactic video) and related delivery methods (synchronous-asynchronous);
- knowledge of e-tivity tools and related methodologies; knowledge on open-courseware environments, sharing sites, etc.

2.5. The sample

The survey conducted was aimed at knowing the effects of the training intervention on the teachers involved:

- total teachers: 49;
- of which 87% women;
- over 50 years of age (73.5%);
- over 10 years of service (75.5%);
- with previous professional training in the technological area (60.7%);
- and middle-management experience in the technology area (68.5%).

2.6. Phases

A – The pre test

- The pre test was administered online (September 25, 2020).
- The objectives of the research, the structure of the tests, the method of carrying out the tests were explained in detail.

B – The course

The course took place from 28 September to 26 November 2020 in a mixed, synchronous and asynchronous way; synchronous activities were preceded by asynchronous activities:

- the asynchronous mode involved the use of short videolessons (about 10-15 minutes), self-produced and OER educational videos, use of forums and etivities;
- the synchronous mode provided for the use of web conference lessons (lasting 1h and 30 ') focused on in-depth study of the contents treated in the asynchronous mode, reflection, questions, interventions by teachers, etc. The lesson was recorded and made available on the platform (moodle);
- the contents covered concerned: module A (know the methodological as-pects of e-learning, Know the tools used in e-learning), module B (Know the conceptual paradigms of educational video, Know the paradigms of the correct use of the didactic video), module C (Know the conceptual paradigms of e-

tivities, Know how to organize and manage e-tivities activities), module D (Know Open courseware and OER repository, Know how to use these re-sources).

C – Post test

The post test was administered online after about 4 days from the end of the teaching activities (1 December 2020).

An evaluation grid has been prepared with indicators and the relative score attributed to each of the multiple choice questions.

Anonymity was respected for the information collected and the data were treated in aggregate form.

3. Data analysis and results

The data were statistically analyzed in two ways:

- description of the variation of the pre-test and post-test averages, aimed at knowing the impact of the training provided on the core of knowledge;
- correlation between responses with negative pre-post tests and two socio-professional characteristics (previous training in the technological area and educational qualification). This is to infer the weight of these factors on the training provided.

3.1. Data description

The table n. 1 shows the comparative distribution of the answers to the questions of each topic of the module, expressed in%.

TAB.1. *Data description*

No.	Mod-ules	Questions	Answer	<i>Pre-test</i> (n. 49)	<i>Post-test</i> (n.42)	<i>Pre/post-test</i>
1	A	Distance learning is:	Type of remote training carried out for school purposes.	47,6%	50%	+2,4%
			General case of e-learning training.	26,2%	18%	-8,2%
			Specific type of remote training.	21,4%	30,0%	+8,6%
			No answer	2,4%	2,0%	-0,4%
2	A	E-learning is realized:	On LMS (Learning Management System) support.	30,6%	27,5%	-3,1%
			Through video-lessons to be	16,3%	2,5%	-13,8%

			viewed in streaming.			
			Via web	53,1%	70,0%	16,9%
			No answer	0,0%	0,0%	0,0%
3	B	Which of the following didactic audiovisual texts is used in synchronous mode?	Video-lesson	73%	48%	-25%
			Web conference	65%	78%	+12%
			Didactic video	8%	10%	+2%
			Simulation video	4%	0%	+4%
4	B	Which of the following audiovisual texts did you use in the course of your teaching activity?	Video-lesson	86%	48%	-38%
			Web conference	39%	55%	+16%
			Didactic video	49%	70%	+21%
			Simulation video	12%	5%	-7%
5	B	Which of the following didactic audiovisual texts can be used according to both transmissive and interactive paradigms?	Video-lesson	57%	43%	+14%
			Web conference	59%	65%	+6%
			Didactic video	22%	23%	+1%
			Simulation video	14%	13%	+1%
6	C	It is called e-tivity:	Framework that allows active and participatory online learning, individual and group.	63,3%	78,6%	+15,3%
			Any exercise proposed in an online learning environment.	20,4%	7,1%	-13,3%
			Specific type of app to organize, manage and produce teaching materials.	10,2%	9,5%	-0,7%
			no answer	6,1%	4,8%	-1,4%
7	C	Which of the following	Padlet	20,4%	28,6%	+8,2%
			Prezi	10,2%	16,7%	+6,5%

		apps do you know?	Infogram	6,1%	16,7%	+10,5%
			ThingLink	4,1%	4,8%	+0,7%
			Coggle	2,0%	2,0%	+2,7%
			Canva	2,0%	2,4%	+0,4%
			No one	55,1%	26,2%	-6,2%
8	D	Which of the following LMS do you know?	Edmodo	24,5%	35,7%	+11,2%
			Moodle	6,1%	21,4%	+15,3%
			Docebo	4,1%	14,3%	+10,2%
			Olat	2,0%	2,4%	+0,4%
			no one	63,3%	26,2%	-37,1%
9	D	Which of the following repository do you know?	RAIEdu-Esplora	34,7%	40,5%	+5,8%
			Didattica a distanza	32,7%	40,5%	+7,8%
			Avanguardie educative	6,1%	7,1%	+1,0%
			Mediateca digitale	4,1%	4,8%	+0,7%
			No one	22,4%	7,1%	-15,3%

With respect to the topics covered in the various modules, there was an average increase in knowledge equal to:

- Module A: + 8.6% regarding the definition of DAD (distance learning).
- Module B: on the conceptual paradigms relating to 'how' to use educational resources such as audiovisual texts, there was the following increase: in synchronous mode (+ 12% video lesson and + 25% web conference) according to a transmission or interactive model (video lesson + 14% and web conferencing + 10%). In this context, there is still a problem related to semantics (use of an unshared terminology) and to the difficulty of using the various artefacts as a function of precise knowledge.
- Module C: with regard to tools there was a general increase, in the above-mentioned: webconference software (+ 3.7%), apps for e-tivity (+ 5%), management systems (+ 9%), websites sharing (+ 4.8%) – the average general increase was + 12%.
- Module D: also with respect to knowledge relating to the use of OERs and repositories, there was an average increase of + 15%.

The only negative variance occurred in reference to the definition of e-learning (Module A) with the figure -3.1%. As shown in Tab. 1, the right answers have decreased ('E-learning is realized on LMS support', -3,1%) and there was a significant increase in one of the misleading answers ('E-learning is realized via web', + 16.9%).

3.2. Data correlation

A correlation analysis was carried out between the only negative pre-post variance, relating to the definition of e-learning (-3,1% = X), and two socio-professional characteristics – previous training on technologies (Y1) and educational qualification (Y2).

The analysis of the correlation was carried out through the correlation coefficient r , by attributing absolute values to the types of answers (3 points, right answer; 2 points, inaccurate answer; 1 point, wrong answer) and to the socio-professional characteristics, previous training (Y1) (3 points, design of learning environments; 2 points, digital technologies; 1 point, technologies) and educational qualification (Y2) (3 points, master and ph.D; 2 points, degree; 1 point, high school diploma).

The first correlation analysis showed a very low direct correlation ($r_{XY1} = 0,024$) with respect to the previous training on technologies (Y1). The second correlation analysis showed a negative correlation ($r_{XY2} = -0,125$) with respect to the educational qualification (Y2).

Compared to the knowledge cores there was a general increase. The strongest increase in knowledge was, above all, in reference to the conceptual paradigms of educational video and the concept of e-tivity. The only decrease occurred in relation to the definition of e-learning, with respect to which the correlational analysis was carried out with the data of previous training and qualification. The correlation is not able to verify the effect of the variables considered but to describe simple relationships between the available data. The weak linear correlation regarding the previous formation ($r_{XY1} = 0.024$) allows us to exclude this factor as incident the wrong answers, while the negative correlation ($r_{XY2} = -0.125$) regarding the qualification suggests that negative answers had an impact, although in a slight way, precisely the high qualification.

4. Discussion

The results highlight at least three significant aspects for the investigation.

With reference to the specific sample of teachers involved – mainly female teachers, of mature age, with over 10 years of service, adequate previous training and considerable experience in middle-management in the technological area – the training course carried out has, in general, considerably increased knowledge in the area of conceptual paradigms of video education and in the area of tools useful for the realization of distance learning (above all, the concept of e-tivity, but also tools such as apps, LMS and repositories of on-line resources). This suggests that, beyond the previous characteristics of learners, training on the technological skills of teachers is always recommended, also for deepening unknown or unclear areas of knowledge.

If we consider the increase in wrong answers on the definition of e-learning, it would be appropriate to think of the difficulty of focusing and distinguishing key concepts, such 'e-learning', 'distance learning', 'remote teaching. Within the declarative knowledge possessed by the teachers about the technological area, a sort of confusion, of probable misconception, would seem to persist between the key concepts that the course carried out has further emphasized. The meaning data on the

negative correlation between wrong answers and high qualification would lead to think that unclear concepts are circulating in the classrooms of universities and that a realignment between what the research says and what is done in the training of teachers in the area of technologies would be necessary.

The COVID-19 emergency led to the development of ineffective remote teaching methods: in the sample investigated, distance teaching, one can guess from the analysis of the results of the entrance test, was used as a move from the frontal lesson, according to a almost exclusively transmissive mode. The exit test showed a significant increase in the knowledge acquired by the sample. A subsequent phase of the project, through an experimental design, with the involvement of a control group (teachers who have not been given the training course) and an experimental group (teachers trained with this training course), will be able to tell us better if these knowledge verified by the exit test were transformed into teaching skills.

Conclusion

The COVID-19 emergency highlighted, as shown by the latest Invalsi data, the use of ineffective distance teaching methods. In high school, 44% of the graduates do not reach a minimum level of knowledge of the Italian language, the overall preparation of 40,000 students seems inadequate. With a growing gap between North and South of Italy.

This highlights, as never before, the importance of the subject of teacher training on the use of technologies from a dual perspective, pedagogical and technical. Despite the efforts made in the past, and in the period of the COVID-19 emergency, it is necessary to intervene more effectively on the initial training of future teachers (Laurillard, 2012; Redecker, 2017). In a didactic environment modified by the introduction of technologies, the way of teaching, the way of relating to knowledge and knowledge, the times and spaces of didactic action change above all the management of the relationship between teacher and students, between students and students. All the evidence now underlines the need for the overall redesign of teaching according to the new and more complex characteristics of this complex and stimulating learning environment. More specifically, as underlined by Messina and Tabone (2014) the teacher must be able to combine disciplinary knowledge with three types of skills: pedagogical-planning to organize environments integrated learning (connection between face-to-face and blended modes); methodological-didactic to manage and offer courses consistent with the learning goals; technological-linguistic to produce multimedia-interactive materials in specific areas of knowledge.

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VOLUME II

LEARNING WITH NEW TECHNOLOGIES, EQUALITY, AND INCLUSION