THE USE OF IPAD FOR SUPPORTING INSTRUCTIONAL PRACTICES IN VOCATIONAL EDUCATION AND TRAINING CENTERS: SEARCHING FOR EFFECTS ON STUDENTS ACHIEVEMENTS

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Abstract

Despite the lack of studies that shows the effectiveness and sustainability of Educational Technologies, the emphasis on them has been encouraging a lot of Italian policymakers to adopt mobile devices (e.g. tablets) in instructional practices of education and training (Avvisati, Hennessy, Kozma, & Vicent-Lancrin, 2013; Pellerey, 2015). In the last years, in Italy, a lot of pilot projects on the use of technologies for supporting of instructional practices have been implemented in general school and Vocational Education and Training (VET) system. The present exploratory study aims to compare the learning outcomes of a group of VET students which used iPad in the classroom with a group of students of the same VET centers which did not use it. 400 VET students from five VET centers were involved. The researchers gathered data about the final exam of the third year students. Specifically, the grades of the common general subjects (i.e. italian, mathematics, and english) were collected. Gathered data were analysed with a quantitative approach. Results show that the correlation between the use of iPad and the students outcomes is different depending on the general subject taken into account. While there is no correlation with what concern italian and mathematics grades, the one with english subject seems to be better. The findings represent the exploratory phase of a wider research project. Thus, new data collection and analysis will be carried on in order to better understand which factors affect students' achievements when they are involved in instructional practices supported by technologies.

Keywords: Educational technologies, iPad, VET, students achievements, exploratory study.

1. Introduction

The efficacy and the sustainability of using ICT (Information and Communication Technologies) in supporting instructional practices has been widely investigated during last years. Over the milestone tertiary meta-analysis of (J. A. Hattie, 2009), in which was demonstrated that the use of technologies for supporting instructional practices has a neutral role in the students goals achievements, several contributions highlight the emerged issues about introducing and using ICT in educational contexts (Avvisati, Hennessy, Kozma, & Vicent-Lancrin, 2013; J. Michael & Ren, 2015; Pellerey, 2015b; Ranieri, 2011). Despite the research on Educational Technologies is still in an exploratory phase, also due to the continue innovations which constantly change this sector, the media emphasis given on them has been encouraging a lot of Italian policymakers to promote the systematic adoption of mobile devices in supporting teachers' instructional practices (MIUR, 2012, 2017; MPI, 2002). As the general school, the Italian initial Vocational Education and Training (VET) promoted several pilot projects with the aim to introduce ICT as a support for didactics and learning processes and good experiences have been identified (Franchini, 2014, 2015). The present exploratory study examines the learning outcomes of a students' group involved in a Pilot Project (PP) promoted by an Italian federation of VET centers, which provides for the use of the iPad in daily teaching and learning activities. The students involved in PP project used iPad' apps and digital contents instead of traditional school books and materials. The VET centers federation promoted the PP through organizational interventions, organizing ICT and pedagogical courses for teachers and families and improving the technological infrastructures of the centers. The VET federation and the participants wanted to be anonymous. Given the above, the aim of this study is to compare the grades of a group of VET students which used iPad in the classroom with a group of students of the same VET centers which did not use it. The assumption is that the students involved will reach higher grades than the students who were not involved in the PP.

2. Methods

2.1. Participants

Participants were 400 VET students belonging to 20 different classes of 5 VET centers; all the VET centers are located in northern Italy and are part of the same VET centers' federation. The students were enrolled in the last year of the "3 years qualification program" and they were following the mechanic or the electric course option. The target group (n=235) was involved in the PP, whereas the control group (n=165) was excluded from the PP.

2.2. Data collection

The learning outcomes analysed in this study (i.e. students grades) have been gathered from the multidisciplinary tests of the regional qualification exam. The assessment tests differed depending on the VET center, but were structured according to the same INVALSI (the National Institute of Educational System Assessment) criteria. Only the grading score obtained in the three common disciplines were gathered and compared: Italian language, mathematics and English language. Moreover, the used grade scales were different depending on the VET center, which is why these were all brought to 100/100 scale. Table 1 reports the students' attributes in detail.

Table 1. Groups characteristics.

Pilot Project	Group	Students	Disciplines
Yes	Target (1)	235	Italian language
			Mathematics
			English language
No	Control (2)	165	Italian language
			Mathematics
			English language

2.3. Data analysis and results

In order to compare the target group and control group, descriptive statistics and t-test were applied. JASP software was used to perform all data analysis. As reported in Table 2, results of descriptive analysis show that the mean of the students grades in the target group are higher only for the English Languages (M=63.50, SD=15.54). Countrarerly, the control groups of students engaged in Italian languages and Mathematics obtained higher grades (M=69.24, SD=17.74; M=62.48, SD=25.15) than the target group (M=66.06, SD=14.11; M=58.54, SD=18.14).

Table 2. Descriptives.

	Italian language		Mathematics		English language	
Group	1	2	1	2	1	2
Mean	66.06	69.24	58.54	62.48	63.50	60.95
Std. Deviation	14.11	17.74	18.14	25.15	15.54	16.19

The T-Test analysis was applied in order to verify the hypothesis: Group 1 > Group 2. Thus, as shown in Table 3, this hypothesis is confirmed only for English language course. This means that only in this discipline there is a significant variation (p= 0.056) of students grades between the two groups (i.e. student grades of target group in the English course are higher than the control group of the same discipline). The hypothesis has not confirmed for Italian languages (p= 0.976) and for mathematics (p= 0.965)

Table 3. Independent samples T-Test.

	t	df	p
Italian language	-1.992	398.0	0.976
Mathematics	-1.818	398.0	0.965
English language	1.590	398.0	0.056

3. Conclusions

Comparing the analysis, the results of the descriptives were confirmed by the T-Test. Having regard to this, technologies education does not seem to have a beneficial impact on the learning outcomes, except for the foreign languages. This situation, in broad terms, is similar to what Hattie (2009) had highlighted. According to this author, the use of educational technologies has not a direct ameliorative effect on specifics disciplines grades. Indeed, when technologies have been investigated by his tertiary meta-analysis, a low Effect Size (ES) has been found (i.e. *Use of calculators* ES= 0.27; *Computer assisted instruction* ES= 0.37, *Web-based Learning* ES= 0.18 in the range of -0.2 to 1.2). According to these considerations, two new research questions emerge: 1) why the use of iPad has an effect only for foreign languages disciplines? 2) Are there other areas in which the use of educational technologies could have an improving effect? Hattie himself, together with other authors (Bonaiuti, Calvani, Menichetti, & Vivanet, 2017; Pellerey, 2015a; J Hattie, 2012; John Hattie & Yates, 2013), suggests that the improvement effect of the use of ICT in the educational field could be obtained only in those cases where the learning context conditions are set in order to effectively promote the self-regulation of students. This positive effect of educational technologies could be also related to technological and pedagogical skills of teachers.

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