A LITERATURE REVIEW OF STUDIES BASED ON INVESTIGATING ATTITUDES TOWARDS INTERACTIVE BOARDS

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Abstract

The attitudes towards integrating interactive boards in educational activities are essential for understanding the position of students and teachers. In this study there was performed a systematic literature review of peer reviewed articles as published between 2000 and August 2015 on the attitudes of educational actors towards using interactive boards in educational activities. As a result of current studies, there was elaborated the IWB-based model, which highlights the role of different components (pedagogical/ instructional, psychological, social, economic, technological) in the effective integration of new technologies in educational activities.

Key words*:* Interactive board; integrative model; attitude

Introduction

Regarding the research based on IWB use, some authors have found that the studies are limited (Somyürek et al., 2009), while other authors believe the existing studies have failed to clearly identify the IWB problems, solutions and their successful implementation in teaching (López, 2010). According to Slay et al. (2008), there are two main directions for research on IWB integration in educational activities: studies based on investigating IWB use in specific areas and research aimed at investigating teachers and students' views of technologies like IWB. Glover and Miller (2002) believed that teachers' attitudes towards technology play a vital role in the effective integration of the technology. The benefits of using information and communication technologies in higher education are also highlighted in the current research.

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Studies Focused on Investigating Attitudes towards Interactive Boards

From the analysis of the current studies that have been performed to examine attitudes towards IWB use in educational activities, several categories of research can be defined as follows (Table 1):

(a) By the research objective; there are different lines of study: a.1. *Identifying the educational actors' attitudes towards different aspects related to IWB* (Bakadam & Asiri, 2012; Balta & Duran, 2015; Gray et al., 2005; Hwang et al., 2006; OguzAkcay et al., 2015; Orr, 2008; Kaya & Aydin, 2011; Şad & Ozhan, 2012; Wu & Lin, 2009); a.2. *Investigating correlations between the attitudes of teachers and students* (Sözcü & İpek, 2012); a.3. *Capturing the relationship between attitudes towards IWB and various variables* (De Vita et al., 2012; Manny-Ikan et al., 2011; Torff & Tirotta, 2010; Türel & Johnson, 2012); a.4. *Identifying the impact of IWB use on teachers and students' perceptions* (Yang et al.,2012); a.5. *Development and validation of tools to examine the attitudes of teachers and/or students towards IWB* (Şad, 2012; Türel, 2011).

(b) By research methods, including b.1. *Qualitative studies* (Lai, 2010); b.2. *Quantitative studies* (Balta & Duran, 2015; Hsieh, 2011; Mathews-Aydinli & Elaziz, 2010; OguzAkcay et al., 2015; Skutil & Maněnova, 2012; Turel, 2011); b.3. *Joint studies* (Manny-Ikan, et al., 2011; Şad, 2012; Xu & Maloney, 2011).

(c) By the subjects involved; there can be studies conducted on c.1. *Pupils/ students* (Kaya & Aydin, 2011; Moss, et al., 2007); c.2. *Teachers* (Celik, 2012; Isman et al., 2012; OguzAkcay et al., 2015; Turel & Johnson, 2012); c.3. *Instructors* (Demirli & Turel, 2012); c.4. *Various personnel* (Manny-Ikan et al., 2011; Schmid, 2008).

(d) By specialisation; there are studies that focus on a particular area: d.1. *Languages* (Mathews-Aydinli & Elaziz, 2010; Xu & Maloney, 2011; Yanez & Coyle, 2011); d.2. *Science* (Hsieh, 2011; Lazăr et al.,, 2013; Mâţă et al., 2013; Tataroglu & Erduran, 2010); d.3. *Social sciences* (Kaya & Aydin, 2011).

(e) By educational level; there are studies conducted at different levels: e.1. *Primary education* (Yanez & Coyle, 2011; Yang, et al., 2012); e.2. *Secondary education* (Lai, 2010; Moss, et al., 2007; Turel, 2011); e.3. *High school* (OguzAkcay et al., 2015; Tataroglu & Erduran, 2010); e.4. *Higher education* (Demirli & Turel, 2012); e.5. *Different levels of education* (Balta & Duran, 2015; Mathews-Aydinli & Elaziz, 2010; Somyürek, et al., 2009).

(f) By the educational activity; research is oriented predominantly to one of the core activities of the educational process: f.1. *Teaching* (Celik, 2012; Isman, et al., 2012; Sad & Ozhan, 2012; Skutil & Maněnova, 2012); f.2. *Learning* (Schmid, 2008); f .3. *Evaluation* (Moss et al., 2007).

Table 1. *Current studies focused on investigating attitudes towards IWBs integration*

Authors (year)	Subjects, level of education, field	Research methods	Basic results
Glover and Miller (2002)	teachers, principals, administrators and students	questionnaire, interview	three kinds of attitudes: 'missioners', 'attempts', 'luddites'
Gray et al. (2005)	language teachers	interview	positive attitude
Hwang, Chen, and Hsu (2006)	secondary school students	questionnaire	ease of use and utility of IT
Moss et al. (2007)	secondary school students	mixed methods research design	teacher and pupil perceptions of IWBs
Orr (2008)	students	questionnaire	pedagogical implications
Schmid (2008)	students and teachers	questionnaire	facilitate language learning with use of IT
Slay, Siebörger, and Hodgkinson-Williams (2008)	students and teachers in primary and secondary education	interviews, focus group	positive provisions to the 'big screen'
Somyürek, Atasoy, and Özdemir (2009)	students	questionnaire	positive feedback on motivation
Wu and Lin (2009)	teachers in primary education	case study	positive effects on student learning
Lai (2010)	teachers in secondary education	questionnaire, observations,	appreciation of benefits from using the IT
Mathews-Aydinli and Elaziz (2010)	students	questionnaire	positive attitudes
Tataroglu and Erduran (2010)	students in high school	attitude scale towards interactive whiteboard in mathematics classes	medium level of attitude towards the use of IT
Torff and Tirotta (2010)	students in primary education	questionnaire	significant relationships between teachers' positive attitudes towards IT and student motivation
Essig (2011)	students in primary education	case study	interactive and interdisciplinary teaching with the use of IT
Hsieh (2011)	future teachers of science	questionnaire	positive attitudes
Kaya and Aydin (2011)	students	survey model	positive attitudes
Manny-Ikan et al. (2011)	teachers, principals, leaders, students	questionnaire, observations,	positive influence on students achievements in learning with the use of IT

Türel (2011)	students in secondary education	IWB student survey (IWBSS)	26-item, three-factor survey
Xu and Moloney (2011)	students in secondary education	observations, questionnaires, focus group, interview	importance of positive attitudes of students and teachers
Yanez and Coyle (2011)	students in primary education	focus group	desire to interact more with IT
Bakadam and Asiri (2012)	students in secondary education	questionnaire, interview	favourable attitudes
Celik (2012)	students	attitudes scale	favourable attitudes
Demirli and Türel (2012)	instructors in higher education	questionnaire	strong favourable attitudes
De Vita et al. (2012)	mathematics teachers in secondary education	questionnaire	acceptance of new technologies
Isman et al. (2012)	teachers in secondary education	questionnaire, observations, structured interviews	favourable attitudes
Şad (2012)	students, a trainer, teachers in primary education	Smart Board Attitude Scale (SBAS)	a two-factor model with 10 items
Şad and Ozhan (2012)	students with primary education specialization	interview	positive feedback to teaching with IT
Skutil and Maněnova (2012)	teachers in primary education	questionnaire	main reasons for using IT
Sözcü and İpek (2012)	students and teachers in primary and secondary education	questionnaire	differences between student and teacher perceptions
Türel and Johnson (2012)	teachers in secondary and high school education	questionnaire	moderate correlation between the perception of the IT and frequency and duration of IT use
Yang, Wang, and Kao (2012)	students in primary education	experiment	positive perceptions of the students in the experimental group
Balta and Duran (2015)	students and teachers from elementary and secondary school classrooms	survey	a highly rated by both teachers and students regarding the interactive whiteboards are
OguzAkcay et al. (2015)	high school teachers	The Interactive Whiteboard Attitude Survey	significant differences for attitudes toward using interactive whiteboard based on gender and content area specialty

IWB-based model

From the analysis of recent studies, new approaches and models can be highlighted regarding the use of IWB in teaching and learning (Liang et al., 2012). From the perspective of developing innovative educational models based on IWB integration, the resistance to change is the most

difficult obstacle for the integration of new technologies in teaching and learning activities. Despite the fact that teachers, trainers or school managers perceive learning environments based on new information and communication technologies as having an important role in education (Kirkwood & Price, 2013), Barak and Ziv (2013) found that there is a tendency to manifest resistance to them and to keep the old and familiar methods. A problematic situation is represented by the attempt to introduce new innovations in technology, such as IWB, into old educational models, as Warwick et al. (2010) noted. The authors noted that teachers have recently begun to discover the potential of IWB as a whole teaching tool (Habib & Johannesen, 2014). Although the integration of new technologies in teaching and learning is growing, López (2010) considered that the evidence of effectiveness of IWB in teaching lessons is missing. Shifting the focus to understanding the educational dimension is vital, as Slay et al. (2008) stated, to ensure optimal use of interactive technology tools.

There are pedagogical approaches that focus on establishing determinants of IWB teaching in higher education (Al-Qirim, 2011), in addition to socio-cultural approaches based on the relational aspects in investigating IWB in teaching and learning (Armstrong, et al., 2005; Santarosa et al., 2014). The educational models appeared as an answer to the demand for correlating new technologies to the pedagogical approach in order to efficiently use IWB in teaching and learning activities in higher education. Besides the technical aspects, there are also teaching factors that contribute to the successful integration of new technologies in educational activities. A number of models were developed regarding the acceptance of new technologies, such as the most recognised model, Davis' Technology Acceptance Model (Davis, 1989; Persico et al., 2014), in addition to other more complex ones based on integrating a number of factors and variables into a whole unit. One of these integrative models was developed by De Vita et al. (2012) based on the exploitation of six variables, such as facilitating conditions, experience in the use of new information and communication technologies, utility perception, perception of ease of use, attitude towards IWB and behavioural intention to use IWB. Another model is the interactive whiteboards-based model of Technological Pedagogical Content and Knowledge – Comprehension, Observation, Instruction and Reflection (Jang, 2010), based on the integration of education processes and peer coaching. Along with these models, the reference model for using IWB in educational activities (Sözcü & İpek, 2012) is noted, which includes pedagogical, technological and psychological variables, along with contextual variables.

In this study, the IWB-based model was designed, which brings together, in a whole unit, the main variables that ensure effective integration of interactive boards in education:

instructional/pedagogical, psychological, group interaction and availability of IWB use. According to the educational models developed in order to contribute to the creation of the necessary framework that stipulates the use of IWB in the educational process, the integrative model is considered appropriate, being based on technological, educational, psychological and social variables. The technological components aim at efficient operational aspects of IWB.

Conclusions

The model underlying this study – the IWB-based model – highlights the role of pedagogical/instructional, psychological, group interaction and availability to use IWB variables in the effective integration of new technologies in educational activities in higher education. After a comprehensive analysis of the research, focusing on investigating attitudes towards the use of IWB in the instructional–educational process, it can be seen that most studies aim to identify perceptions and representations of various aspects of IWB use.

In contrast, few studies aim at investigating the correlations between the attitude of teachers and students, and few attempt to determine the relationship between attitudes towards IWB and other variables, such as lesson engagement, school motivation, etc. Depending on the research methods, quantitative studies based on the questionnaire are prevalent in qualitative research. More than that, most studies are focused on identifying the perceptions of teachers and students rather than on exploring the attitudes of instructors and school managers.

Regarding school subjects, most studies are conducted in teaching and learning languages and sciences, while few studies can be found in the field of social sciences. There are no available studies that focused on investigating the attitudes towards IWB in technical sciences, as well as sporting or artistic ones. Regarding educational level, studies in primary and secondary education are predominant, while there are fewer in secondary and higher education. Another important aspect that emerges from previous studies is that most studies focus on attitudes towards IWB in teaching and learning and very few study attitudes towards IWB in evaluation activities.

The results indicate the need for further approaches that are meant to effectively integrate interactive boards in higher education. In addition, there is a need for new studies based on investigating the attitudes of teachers, trainers, and school managers, as well as for establishing the correlation between the attitude of students and teachers. These future studies are particularly useful for identifying situations that may result in really enhancing education quality.

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