INTERACTIVE WHITEBOARD:
Adoption and the Impact of its Utilization on Student Learning in South Australian Secondary Schools

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Abstract

This research study explored the adoption and utilization of Interactive Whiteboard (IWB) technology by teachers and students of secondary schools in South Australia, Australia and investigated the impact of its use on the student learning (learning approaches and quality of learning outcomes). This research was conducted using a mixed method design which was comprised of both the quantitative (predominant) and qualitative (supportive) approaches for collecting and analysing data. Three different survey questionnaires were used for the quantitative phase during which data were collected at school (12), teacher (30) and student (269) levels. Interviews were used to collect qualitative data from 16 teachers.

The school questionnaire had some general questions to collect some information regarding the kind of Information and Communication facilities present at the schools; the teacher questionnaire included four scales which were Attitudes towards ICT (AICT), Attitudes towards IWB (AIWB), Approaches towards Teaching (ATI) and Classroom Interactions using IWB (CIIWB); and the student questionnaire was comprised of five scales which were Attitudes towards ICT (AICT), Attitudes towards IWB (AIWB), Classroom Interactions using IWB (CIIWB), Learning Approaches using IWB (LA) and Learning Outcomes using IWB (LO).

The Cronbach's alpha values and Confirmatory Factor Analysis (CFA) techniques were used to establish the reliability and validity of all these scales. Single Level Path Analysis (SEM) technique was used to examine the relationships among the variables present at teacher and student levels separately. To examine the relationships among the nested variables at three levels (school-teacher-student) and the cross-level interaction effects on the outcome variable, Hierarchical Linear Modeling (HLM) was used. The interview data were hand analysed using open-coding technique.

The findings from the teacher level path analysis revealed that the classroom interaction level of teachers using IWB was positively influenced by their attitudes

towards IWB, the IWB related support they received from schools, their student-focused teaching approach and their age. The results from student level path analysis showed that the students' perceived classroom interactions using IWB were positively associated with their perceived deep learning approach (direct association) and their perceived quality of learning outcomes (indirect association through deep learning approach). Students' attitudes towards IWB also had significant positive influence on their perceived deep learning approach, their perceived classroom interactions using IWB and their perceived quality of learning outcomes.

The three-level (HLM) model of deep learning approach using IWB indicated that perceived classroom interactions using IWB (student-level factor), IWB support (teacher-level factor) and ICT integration level in classrooms (school-level factor) had direct positive influence on their perceived deep learning approach. The three-level model of learning outcomes using IWB revealed that students' perceived learning outcomes when using IWB were directly influenced by their perceived classroom interactions, their attitudes towards IWB, their perceived deep and surface learning approaches, their gender (all student-level factors) and the age of the teacher (teacher-level factor).

Overall, it was evident that the students who had experienced an interactive and enhanced interactive classroom environment using IWB, and those who had more positive attitudes towards IWB tended to adopt a deeper learning approach and the quality of their learning outcomes improved. This association between these important factors provides clear evidence that the IWB technology, when used in an interactive or enhanced interactive way by the teachers and the students, can make the students more inclined towards adopting deeper approach to learning along with improving the quality of their learning outcomes.

The major contribution of this study is in the form of providing the much needed evidence of the impact of the use of IWB on the learning of the secondary school students along with the understanding of the inter-relationships among various other important factors at school, teacher and student levels. In future, more exclusive studies can be done to explore the issues of learning approaches and

learning outcomes using IWB in separate studies using longitudinal or other suitable research methods.

Keywords: Information and Communication Technology (ICT), Interactive Whiteboard (IWB), IWB adoption, IWB use, ICT attitudes, IWB attitudes, classroom interactions using IWB, learning approaches using IWB, learning outcomes using IWB, student learning, teaching approaches, mixed-method research, secondary school teachers, secondary school students, secondary schools, South Australia, Australia.

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