

## EFFECTIVENESS OF USING E-BOARD FOR LEARNING PROCESS IN A DEVELOPING COUNTRY – CASE STUDY

Faiz MMT Marikar, Kasun Alwis, SN Satharasinghe, DAP Wickramasinghe, KKGGS Kariyawasam,  
General Sir John Kotelawela Defence University, Ratmalana, Sri Lanka  
(Correspondence to Faiz MMT Marikar email: faiz.marikar@fulbrightmail.org)

### ABSTRACT

This study examines the importance of e-board learning and its effect in teaching at Defence University in Sri Lanka. Even after 3 years of usage of e-Boards there are some practical issues on usage of e-Boards. Therefore this study examines students' and teachers' impact on e-board for learning and teaching process. In a developing country the importance of underlying information technology principles that are critical for an in-depth learning by e-board platform. A structured multiple choice questionnaire was distributed among students' and lecturers that were enrolled and employed at the General Sir John Kotelawela Defence University, Sri Lanka. A total of 300 students and 30 lecturers participated in this study and completed written and online questionnaire related to e-board. The outcome of this study shows that there is a strong positive response on e-board learning among students and they believe lack of support from the technical support to improve the current situation. Lecturer's perspective was entirely different they believe mixture of traditional method or blend will improve the quality of learning than e-board. Therefore there were somewhat 50% or more lecturers avoid using the new technology due to this reason. Both parties believe that e-board is better than multimedia. Although the outcome is preliminary in nature, the results provide cause for concern over the status of e-board education in Sri Lanka which is not satisfactory.

**Keywords:** e-board, effectiveness, blend method

### INTRODUCTION

From the ancient time all the teachers used some kind of board to demonstrate and write the things & display to the class. Time by time that was getting evolved and now there are technically developed electronic display boards can be seen in many educational institutes and companies. Ancient teacher used a sand board called "Weli Pilla" to teach how to draw letters and traditional arts to students. After that South Asian schools used black boards to teaching. It was a black coloured wooden board or a board made on surface of the class room wall. Chalk sticks were used to draw on it. Drawings could be erased by rubbing the board. But it made lots of chalk dust & prolonged exposure to that dust brought several respiratory illnesses to teachers in that era.

As a solution white boards came to the story & they were popular among all teachers and students. Because it is very smart looking, clear writing & due to markers can be used as several colours and easy to erase. White boards were made used with different sizes. Even today also each and every school use white boards. By using it teacher can teach freely & manually with illustrating anything.

Sometimes projectors and projector screens were used to illustrate digital media to the class. So to project the image there should be a white surface. Due to that reason whilst conducting lectures the lecturer or someone else have to control the display operating the computer. Today also commonest teaching method is this. As a further development of white boards & projecting on to screens, fixing these both items together, hybrid solution was innovated as electronic illustration boards or Smart boards. Simply we called them as 'e Boards'. It facilitated the projection on to a white board & ability to write on it same time by handling the PC screen manually touching on e board. It based on a simple technique which used same as in laptop touch pads. Actually it is also a magnification of laptop touch pad. It's like projecting desktop screen on to the laptop touch pad. A small screen or marked particular area of display represents the display. Today different companies produce these smart boards with different marketing brand names. But the concept around is similar.

The E-board also includes many special features such as video and image capture which facilitate the sharing and storing of class content, magnifier and spotlight features which enable part of the screen to be highlighted, magnified or resized, and the file viewer feature which reads documents created on the interactive whiteboard, and to preview tasks currently being operated on the screen. Each content page can be moved, copied, printed or deleted while on display in thumbnail view, on the screen.

The E-board technology helps the students to set their potential free, the Teachers to enhance their communication abilities through an innovative and user friendly display solution that creates a vigorous and efficient learning environment. Multitasking is another noteworthy feature of the E-board. It is capable of giving the audience a seamless educational experience by running multiple programs during lectures or presentations.

Also, there's no lag time while transferring from one program to another. Students can also review past lectures posted onto the school homepage.

Education has always been the most significant aspect of human life. Although the sources of education kept on evolving through the ages, it still remains to be an inseparable part of 'living'. With the advent of the industrial age, occurred the rapid development of technology, helping a great deal in educating the masses all round the world (Alexander & Golja 2007). Technology is proved to be of profound help for teachers in teaching as well as for students in learning. The attractive and easily comprehensible nature of digital technology make the process of education more entertaining, interesting and therefore efficient (Ballera *et al.* 2015; Beatty & Ulasewicz 2006). This could also be the major reason for the adoption of technology in teaching methodologies by education policy makers. With the advances in digital technology, information sharing methods worldwide are gradually evolving (Weller 2007). Yet, the low quality and high maintenance costs of information delivery sources such as projectors are ineffective for modern day classrooms and meeting rooms. Teachers nowadays are incorporating new modes of communication in order to bridge the gap between them and their audience/students and the recent developments in display technology have made it a possibility (Shee & Wang 2008; UNESCO 1994). Reliable sources proclaim that more and more countries have brought internet and interactive display boards into the classroom and other buildings, creating new avenues of information sharing and presentations for education and business applications. Furthermore, they thoroughly believe that the E-board is soon to become an essential element in both education and business sectors.

E-Boards are one of the many different interactive whiteboards available for learning purposes. The SMART Board is a touch-sensitive whiteboard which is connected to a PC and a projector. Lessons are made on computer programs and then the projector displays the image onto the whiteboard. The computer is then controlled by either using your finger to open or close programs and move objects, or by electronic pens to write words. SMART Boards are powerful learning tools as they enable teachers to teach using the latest technology, with access to the internet, videos, and educational software (Fernandez & Luftglass 2003). This help students to learn and explore new concepts with technology to create a more dynamic learning experience. However, SMART technology more than "75% of classrooms in the United Kingdom have adopted the multimedia technology" (Moorhouse 2007). School districts, principals and educators are now seeing the importance of this technology in the learning process as it enables students to explore concepts in ways that were not previously possible. As more schools are becoming equipped with interactive whiteboards, "there is a real need for teachers to play an active role in specifying the ways in which this extremely powerful tool is installed and used" (Technologies 2015). There is a high relationship between e-learning and e-boards because the combinations of modern technologies give more effective outputs. The SMART Board provides teachers and students with a whole new interactive learning environment to share ideas, information, images, animations, audio or video (Pintrich & Schunk 1996; Reis 1998). Learning is much more powerful if it is multimodal and the SMART Board supports several different learning styles - visual-spatial, auditory and kinaesthetic. Young students are highly motivated when content is presented on a SMART Board. It increases their enjoyment by being physically involved touching and moving objects and by the size of the screen which makes images large enough for everyone to see. The engagement and knowledge building of young students is fostered when they are given the opportunity to interact in a physical and mental way in the learning environment. However, there are some major obstacles to overcome such as technical issues, computer facilities, and treatment of errors. (Suvorov 2015)

The massive effectiveness of an e-board lies on the fact that it holds the attention of an audience to the extent that it increases participation, enhancing the overall learning and information sharing experience to a great deal. As a combination of the simplicity of a whiteboard and the power of a computer, the e-board is capable of enhancing any learning environment showing an evident increase in student participation, better visual presentation and more efficient lessons. The multimedia educational content technology of an e-board facilitates virtual lectures, also offering a wide range of classroom activities. In addition, the e-board provides dustless air and thereby a more comfortable atmosphere as it doesn't require chalk. E-boards also provide simplified and direct access to e-books, CD's, videos, animations, images, power-point presentations and other internet content (Martín-Blas & Serrano-Fernández 2009; Narciss *et al.* 2007). This element encourages interactive communication, connecting teachers with students or presenters with attendees. Participants are given the space to share files and other material while the teachers or the presenters are given the authority to control audience devices during the classes. This method helps in improving learning skills outside of the classroom while also making the students focus more during class. E-boards are embedded with touch sensitive optical technology, permitting the presenter to access PowerPoint presentations, videos, images and more with the mere touch of a finger (Kaminski 2005).

At the beginning companies used resistive technology for interactive whiteboards. Between flexible plastic front sheet and hard back board there was a resistive thin film inside. Pressure applied to the front sheet

and it act as the acceptor point for input. This acceptor point then converted into an analogue signal to data flow. It sends to the computer for further processing. This can manage with finger or pen tool like pointer. This E boards which are currently using for the teaching purposes, company presentations, Exhibition is displayed and conducting meetings. It has been used on the Discovery channel also.

In 2011 General Sir John Kotelawala Defence University in Sri Lanka introduced their e-board system to the every department, though it was common in the west still it is indeed a luxurious thing for us. So it helped both lecturers and students maximize the teaching and learning out puts. Though, it was introduced still there are some problems of usage. So in this study we address the issues of application of the system how far successful the mission and if there are gaps how to bridge it.

## METHODOLOGY

In this study we have examined teachers, students' capabilities of learning with e-board, especially concepts and knowledge on the learning platform in university system. This topic was judged to be extremely important to have a conceptual understanding of what is e-board and to find out in detail knowledge on current trends in interactive board. The study design in this study is presented in the Figure 1. Approval for the study was obtained from the Staff Development Center. Target population of this study represents all faculties from the university, including staff and students. All lectures and students were given a questionnaire related to e-board platform known as interactive board. One hundred students and thirty lectures, which participated in the consecutive e-learning and gave their consent, were included in the study. The purpose of the study was explained to the lecturers and students at the beginning of the lecture. The students who consented to participate in the study were individually tagged and given them a tag. They were allocated to a group the e-board based practical spot test group ( $n=130$ ).

Qualitative analysis of this study was done with an in depth interview with Mr. Nernanjaka Jayarathne (lecturer in Mathematics KDU), because he is the expert on this field. What are the benefits to KDU by using e-board? Using e-board and MOODLE we can reduce paper works. Lecturers can upload lecture notes, assignments, video clips and etc by using simultaneously with the both application. Using e-board we can conduct the lecture in real time and online assignments can be given because of this facility no one can cheat and we can grade them automatically, and the safety of MOODLE and e-board is very high so no any 3<sup>rd</sup> party allowed entering the system.

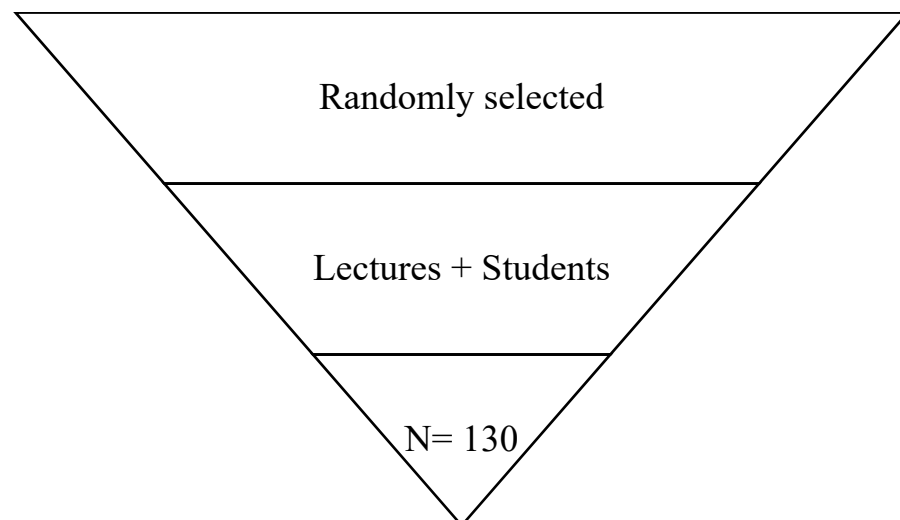


Figure 1 – study design

## Questionnaire Used

A questionnaire, onself generated e-board was introduced “Learning with e-board”. The data were collected by means of the questionnaire consisted of 20 items including questions which generated in the printed platform (Appendix 1 and 2). The use of the questionnaire was justified because it had been prepared by an experienced research group working in e-board learning education and it had already been tested and validated before the distribution. In addition, the questionnaire was designed to assess conceptual understanding of e-board in the Sri Lankan university. The question which was used is attached as the Annexure.

### Research Context and Participants

One hundred and thirty took part in this study. Six faculties including Law, Medical, Allied Health Sciences, Engineering, Management and Defence equally represent from General Sir John Kotelawela Defence University, which was located in Ratmalana, Sri Lanka. All students were employed at the university as lectures or enrolled as students. The students learned about basic of e-board learning by self learning and all the materials were provided at the learning phase. The Faculty is a socially and economically diverse community in Western Province of the country and this is the one and only Defence University in this country. The students had the backgrounds knowledge of knowledge on computing and e-learning with respect to e-board.

### Administration of Questionnaire among the Students

The questionnaire was administered among each of the respective students at the university; with respect to e-board within a period of a week they have to answer the entire question online or printed form. Care was taken to avoid exchanging the students' information or ideas.

### Data Analysis

To analyze the questions, we compared informal reasoning displayed by individuals representing high and low level of understanding of e-board with the computer aided interactive board system. The validity of the translation was independently assessed by two observers competent in English language. We analyzed our data as a balanced figure in a percentage of application. For statistical analysis, we transformed all our data using the basic statistical analysis package

### RESULTS AND DISCUSSION

According to our study 30% students only have aware on e-boards before join to the KDU. It seems still overall students enter to the university system doesn't have an experience on new technology. Final outcome revealed that, 70% students learn from e-boards because of introduction of new technology to KDU. It is a large amount of students had their first experience here at KDU.

According to the Figure 2 most of the students don't have an idea on basic operating e-boards. Main reason is lack of knowledge on use of e-board and therefore they try to learn from it. If they have an idea they can arrange the class room to make the best out of it and learn from it. So because of less knowledge of students always need a training support officer for the connecting and arranging the class rooms. Normally class room arranging is done by the training support staff for the e-boards. Therefore before the lecture they should connect the e-boards and should check whether it works or not before the lectures start.

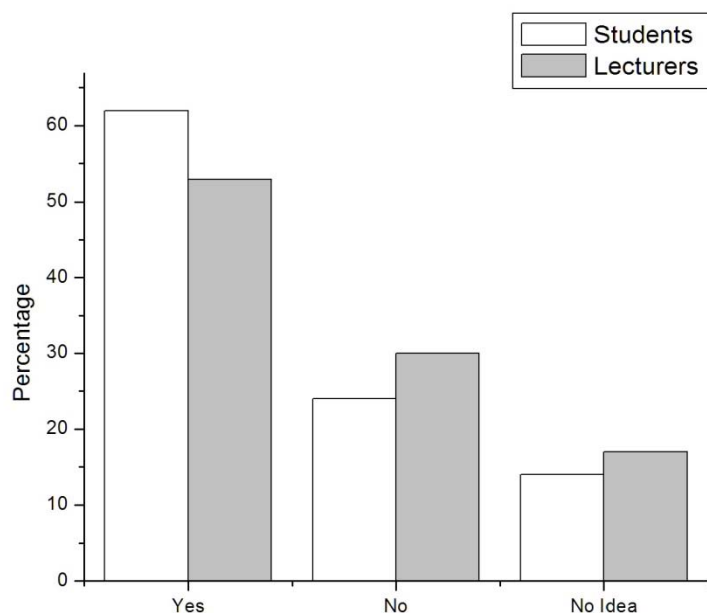


Figure 2: Awareness of operating E-Board system

As per our findings students said there is no any person fully aware on operating e-boards. But 70% or above technical support staff are well trained and know how to use the e-board Next important thing is lecturers' awareness on e-boards. Because it is vain having all the things if the lecturer is don't know how to conduct a lecture using e-boards. So the lecturer should aware on how to work with the e-boards. According to figure 2 more

than 50% lecturers are aware and manageable to use e-boards. Out of all the lecturers 18% are not aware in using the e-board.

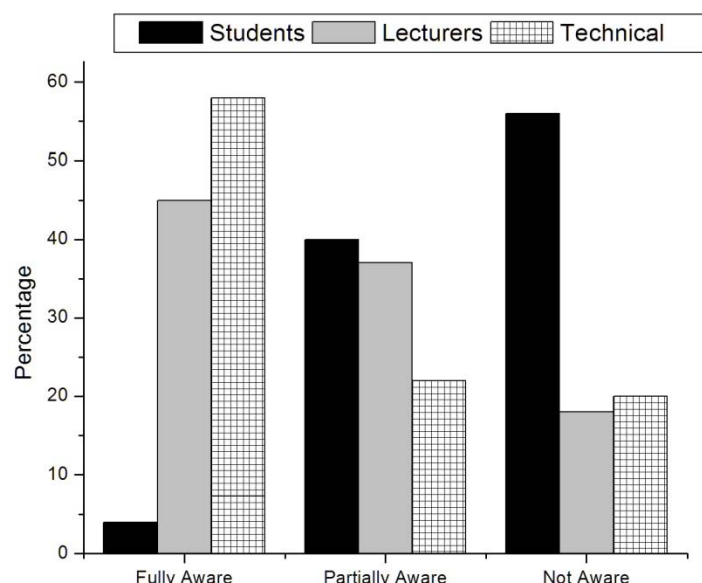


Figure 3: Use of E-Boards better than multimedia projectors

However most of the students don't have the knowledge on e-board while they were enrolled but students like to learn from these e-boards they need to take real benefit from it. In this study 62% students agreed that e-boards are better than multimedia because of its usages and stored things can be accessed remotely. (Figure 3). But according to their views, most of them inside the KDU use e-boards as multimedia screen. As per the figure 3 most of the lecturers agreed that the e-boards are easier than the multimedia. Because the multimedia gives as only image if we want to do something we have to do it in computer. But 15% lectures not agreed due to the subject field multimedia might easier to them.

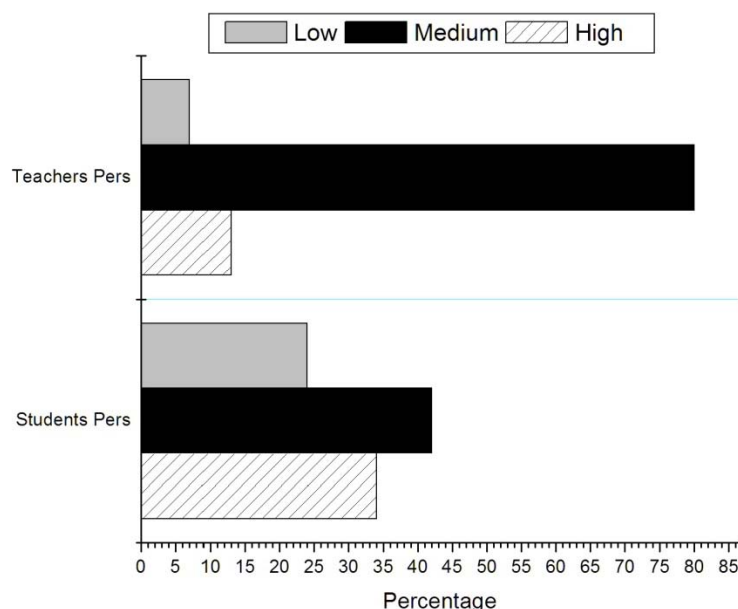


Figure 4. Attraction towards the lectures using E-Boards

As per the Figure 4 the important thing is the attraction towards the lectures. Student's attraction is high towards the lecture; it means the effectiveness also high. One of the purposes of introduction e-boards is to increase the students' attraction towards the lectures and it was kind of fulfilled by e-board. According to the questionnaire that purpose has fulfilled because all of the students in good side. This is strength to the KDU by using e-boards we can increase the results of the students. Furthermore according to the figure 4, when consider teachers



perspective the main purpose of fixing e-boards was to give more support for the conduct lectures and to increase the attraction of students towards the lectures. But as per our research according to the lecturers view the attraction of students not increased very much. According to this study findings 80% lectures said the attraction is medium.

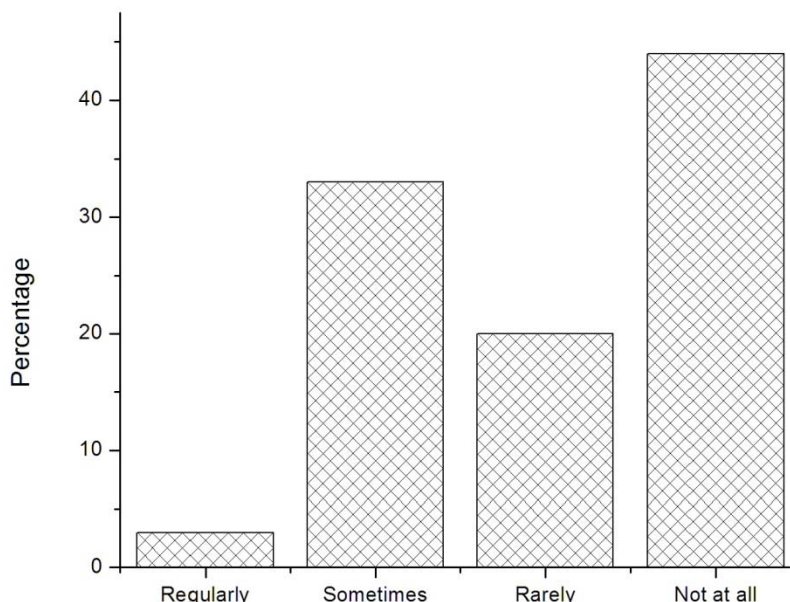


Figure 5: Lecturers use of E-Boards

In this study we selected lecturers randomly and distributed questionnaire among them. As per our research most of the lectures not use the e-boards for their lectures. The reason behind this is most of the lectures don't have the technical support for the operating e-boards. As per our research even ICT department don't use e-boards properly. According to the figure 5 out of 30 lecturers 13 don't use the e-boards (45%)

## CONCLUSION

The technical support officer has the responsibility of operating e-boards. Normally they fix the computers to the multimedia as well as e-boards. But the problem is still they don't have fix computer for the class rooms. They have only few laptops and they fix them as per the requirements. Still the technical support officer computers run windows 7 operating system. Updated version of e-boards software not works properly for the windows 8 and 10. So most of the lectures, they have to install version of windows 7 for the technical support officer laptops.

The technical support officer has trained by the IT department. They give the basic knowledge on operating e-boards. Installation of software to the technical support officer computers are done by the IT department, technical support officer not allowed doing those things. Still the KDU has small number of e-boards in small in size and it is not enough for a big class room.

Finally we would like to recommend all laptops install a stable version of operating system for E-Board software. Furthermore each classroom must have a permanent laptop, projector if not increase the number of laptops for the technical support officer. Finally all must be educated the importance and effectiveness of e-board at university level first then go for the state level as well.

## Acknowledgement

We would like to acknowledge Mr Neranjaka Jayaratne is a lecturer in mathematics in the Faculty of Engineering, General Sir John Kotelawala Defence University. The authors wish to thank all the lectures who participated in this study at General Sir John Kotelawala Defence University, Sri Lanka

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## APPENDICES

### QUESTIONNAIRE FOR STUDENTS ON USING OF E-BOARDS AND ITS EFFECTS.

**Please be kind enough to fill these two types of questionnaire in order to derive important findings in our research.**

Please put ✓ mark in front of your stream.

MBBS ☐      ENG ☐      LLB ☐      MTS ☐      SS ☐      LG ☐

1. Do you have experience on e-boards before join to the KDU?

Yes ☐      No ☐

2. Are you aware on how to operate e-board system?

Totally aware ☐ Partially aware ☐      Not at all ☐

3. How many times do you learn from e-boards per week?

Every day ☐      1-4 days ☐      Never ☐

4. Do you think e-boards better than projectors?

Yes ☐      Same ☐      No ☐

5. Compared to other teaching techniques do you think e-boards enhanced your attraction towards the lesson?

Poor ☐      Average ☐      Good ☐      Very good ☐

6. 'Introduction of new technology to the class rooms is important to improve learning ability of students' do you agree with this?

Strongly agree ☐      Agree ☐      Neutral ☐      Disagree ☐

7. Are you satisfy with learning through e-board system here at KDU?

Strongly satisfy ☐      Satisfy ☐      Neutral ☐      Not satisfy ☐

8. As per your experience at class rooms do you feel that the technical support staff (TSO) ate fully aware on operating e-board system?

Fully aware ☐      Manageable ☐      Partially aware ☐      Not aware ☐

9. Do you think the learning from e-boards is effective for students at KDU?

Yes ☐      Neutral ☐      No ☐

10. Do you agree that Awareness of e-boards among the students to be increased to get maximum results

Strongly agree ☐      Agree ☐      Neutral ☐      Not agree ☐



11. As per your experience do lecturers aware on how to teach using e-board in class rooms.

Fully aware ☐ Manageable ☐ Aware but not manageable ☐ Not aware ☐

12. Anything you need to mentioned

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### QUESTIONNAIRE FOR LECTURERS ON E-BOARDS

Dear sir/madam,

Please be kind enough to fill this questionnaire in order to derive important findings for our research.

Please put ✓ in front of your answer.

01. Do you use e-boards for your lectures?

Regularly ☐ Sometimes ☐ Rarely ☐ Not at all ☐

02. Do you feel it is easier than projectors when conducting a lecture?

Yes ☐ No ☐

03. Do you have confidence on new technology?

Yes ☐ No ☐

04. When conducting a lecture do you have enough technical support to use e-boards?

Yes ☐ No ☐

05. Compare to the traditional learning systems the attraction of students on lectures is

High ☐ Medium ☐ Low ☐

06. Do you think e-boards are effective for every subjects?

Yes ☐ No ☐

07. According to your opinion the number of e-boards in KDU should increase or not

Yes ☐

No ☐

08. Do you have any suggestion to enhance the productivity of e-board system in KDU?

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