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INTRODUCTION

REVIEW OF LITERATURE

NEED/IMPORTANCE OF THE STUDY

STATEMENT OF THE PROBLEM

OBJECTIVES

HYPOTHESES

RESEARCH METHODOLOGY

RESULTS & DISCUSSION

FINDINGS

RECOMMENDATIONS/SUGGESTIONS

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ACKNOWLEDGMENTS

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APPENDIX/ANNEXURE

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- Hunker, H.L. and A.J. Wright (1963), "Factors of Industrial Location in Ohio" Ohio State University, Nigeria.

CONTRIBUTIONS TO BOOKS

- Sharma T., Kwatra, G. (2008) Effectiveness of Social Advertising: A Study of Selected Campaigns, Corporate Social Responsibility, Edited by David Crowther & Nicholas Capaldi, Ashgate Research Companion to Corporate Social Responsibility, Chapter 15, pp 287-303.

JOURNAL AND OTHER ARTICLES

- Schemenner, R.W., Huber, J.C. and Cook, R.L. (1987), "Geographic Differences and the Location of New Manufacturing Facilities," Journal of Urban Economics, Vol. 21, No. 1, pp. 83-104.

CONFERENCE PAPERS

- Garg, Sambhav (2011): "Business Ethics" Paper presented at the Annual International Conference for the All India Management Association, New Delhi, India, 19–22 June.

UNPUBLISHED DISSERTATIONS AND THESES

- Kumar S. (2011): "Customer Value: A Comparative Study of Rural and Urban Customers," Thesis, Kurukshetra University, Kurukshetra.

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WEBSITES

- Garg, Bhavet (2011): Towards a New Natural Gas Policy, Political Weekly, Viewed on January 01, 2012 http://epw.in/user/viewabstract.jsp

AN EXPLORATORY STUDY OF THE POTENTIAL OF 'KatSRS SYSTEM' AS AN EDUCATIONAL TECHONOLOGY IN FACILITATING LEARNERS' ENGAGEMENT AND FEEDBACK: A CASE STUDY OF BOTHO UNIVERSITY

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ABSTRACT

Learners' engagement is the main key to achieving better teaching and learning. In recent years, a variety of educational technologies have been used to motivate learners to participate in learning. Amongst these tools, students' responses have proved to be very useful. The trend has been to equip students with clickers and simple cellular phones to cast votes and send their anonymous responses to the receiver. In contrast, Katlego Students' Response System is an intranet system that captures students' responses via the desktop and laptop computers to the main server. The purpose of the present study is to investigate the potential of the Katlego Students' Response System as an online educational technology to facilitate classroom engagement and feedback in teaching/learning. The study group consists of students from the Computing Science department at Botho University (N=80). In the study an experimental design was used over six weeks. Data was collected using Katlego Student Response System, feedback/evaluation forms and oral interviews. The findings of the study revealed that the Katlego Student Response System is more effective in increasing learners' engagement and experience. However, acquisition and setting of the appropriate equipment, software and sufficient network bandwidth remains a challenge since Botswana is a developing country.

KEYWORDS

KatSRS, educational technology, feedback 360d, students' response system.

INTRODUCTION

High levels of learners' involvement during a learning session are not easy to achieve or ascertain in a classroom. Furthermore, real-time feedback may be one of the difficult components to access from students especially if a class consists of varied learners with different backgrounds and learning efficacies (Dunn and Dunn, 1992; Dyson, 2008). In any classroom setting, students' ability to listen and understand and students' capability to provide real-time feedback are valuable parameters in measuring success in learning and teaching. The rationale behind these metrics is to identify means by which a teacher can assist students on time to facilitate successful and progressive learning. Real-time feedback provided by students during a lecture is also central in assisting the teacher in measuring how effective is the teaching approach used. The research seeks to evaluate how Katlego Student Response System (KatSRS) a component of Katlego Feedback 360d can be embraced as an online tool for evaluating learning and teaching in class before, during and after the lecture. This would not only assist in encouraging learners' engagement in class but, also it would be used as a tool to assist the lecturer in gauging success in his/her teaching approach.

BACKGROUND

Many students at Botho University face problems of making meaningful contribution to the discussions during lectures due to a number of factors. The factors contributing to loss of students participation in class include (a) fear of being embarrassed if their contribution is incorrect or trivial, (b) expectation by some students to be quite while the lecturer talks (Caldwell, 2007; Dyson, 2008), (c) loss of opportunity by some students because vocal students always dominate all discussions in class (Sellahewa, 2011) and (d) language barrier (Turugare et al., 2012). These problems present challenges to learning/teaching because learners' engagement is a vital component that teachers can use to assess an effective learning process.

In the months of July to September 2012, Botho University lecturers (Francistown) conducted peer assessment to investigate challenges faced by both students and lecturers in teaching and learning. The motive for this exercise was to try and mitigate any issues arising from limited resources or to determine better strategies for handling classroom by lecturers. Some of the challenges uncovered include:

- **STUDENT INTERACTION**

It was discovered that participation is not evenly distributed among students. This observation concurs with Horowitz (2006) investigation on the role played by SRS systems on influencing learners' engagement in class. According to Prof. Harold Horowitz in Horowitz (2006), ten to twenty percent of the students in class dominate the discussion and these students are the ones who ask questions, offer unsolicited comments and they always volunteer to provide answers posed by the teacher.

- **AVAILABILITY OF TIME**

During a normal lecture, time available does not allow all key points to be covered if the lecturer encourages learners' questions and comments as part of the learning process.

- **TIME MANAGEMENT VERSUS ATTENTIVENESS**

Peer observations carried out noted some problems when it comes to time allocation and student alertness and attentiveness. Duson Benjamin, Tumkaya and Songul (2012) and Harold Horowitz the director of the IBM Corporate Education Centre have conducted the same investigations and reported that there is a significant dichotomy between efficient time allocation and student attentiveness (Horowitz, 2006).

The challenges outlined above point to the need for a more effective learning-teaching environment to encourage learners' engagement in class (Houghton, 2004). This paper attempts to establish how effective the KatSRS system is, in facilitating and improving learners' engagement.

REVIEW OF LITERATURE

The most dominant delivery methods at higher-education Institutions remain lectures and lectorials (Caldwell, 2007). According to Habeshaw and Biggs (1992), the lecturing methods involve a large span of uninterrupted discourse from a lecturer with no discussion between learners and no learners' activities other than listening and note-taking if not "face-booking" at the back of a classroom. The description of the lecture method given above reflects that despite its long dominancy as a delivery method, it has failed to get learners' full engagement and attention in class. Botho University is not an exception; it has been observed that students start losing attention the moment they are not encouraged to take part in some form of activity or group discussions. Basically, lecturing has proved to be amongst some ineffective methods of delivery especially if not coupled with some intentional interventions (interactive windows) that could make teaching-learning livelier (Knight and Wood, 2005).

Without redesigning approaches to teaching/learning, it has been proved that traditional methods can be improved by introducing regular "*interactive windows"* that encourage active learning and hence improve learners' engagement, (Eric, 2005). Dyson (2008) observed that a teacher can boost students engagement and reflective learning by using a simple "*three-one-minute interactive window"* strategy that involves the use of three interventions to enable the students to take part in assessing their lecture engagement. The windows are:

- A["Write one thing you have learnt so far"],
- B["Write one question you have that has not been answered so far"] and
- C ["Short break"].

In this context learners can be engaged by allowing them to reflect on one thing they have learnt and one question that has not been answered so far in every 20 minutes time intervals and then take a rest. This design makes it possible to assess two things: (a) which intervention led to an increase in lecture engagement and (b) whether these effects were limited to a specific time during the lecture. The findings indicate a positive increase in students' participation in class when such a tool is used (Dyson, 2008).

Sellahewa (2011) introduced a system called EduMECCA which is quite a relevant scenario of some promising Student Response System's (SRS) tool for use in class. Unlike traditional Electronic Voting systems (EVS) that use clickers and purpose-built-infrastructure, the SRS uses widely available mobile devices and mobile services to collect student responses in a convenient way. According to Sellahewa (2011), Student Response System's increase participation, helps students understand the lecture and indicate where further effort is required. According to Duman in Dunn and Dunn (1992), careful administering of traditional small-scale interventions is not only useful for improving students' engagement, but it is a strategy useful for attaining good learners' motivation, acquisition of content knowledge and internalization of meaning (Duman, 2010). These learning gains can be achieved by encouraging learners to take short breaks, drink water, engage in brief discussions and solve small cross-word puzzles (Duman, 2010; Dyson, 2008).

The advancement of modern Educational Technologies (EDuTech) has seen substantial technologically sophisticated solutions to engage students in learning anonymously (Dyson, 2008). The past two decades have been characterized by spontaneous innovations where Universities and other higher educational institutions employ response systems, clickers or audience response systems (Caldwell, 2007) in assessing lecture engagement. In general, the SRS and EVS systems are introduced in class to address the main challenges of obtaining maximum possible students' engagement in classrooms where it is difficult to have a meaningful engagement between the teacher and the learners or to gauge the learners' comprehension due to lack of sound participation by the learners (Knight and Wood, 2005). The problems mentioned above are very prevalent at Botho University.

FEEDBACK 360d AND KatSRS SYSTEM

Feedback 360d system is designed to allow students to give feedback about their faculties and their program of study. The feedback is anonymous so the students are encouraged to write freely. It helps management review the performance of faculties and review program syllabuses and then set up ways to improve that, if needed. The system provides the following functionality:

- Creating batches, programmes, faculties and periods of feedbacks,
- Creating feedbacks (Student feedback, Network laboratory feedback, customer satisfaction feedback, Open University feedbacks),
- Generating Login IDs for student to take feedback, this login IDs are one time use,
- Students taking feedbacks, and
- Generating reports of the taken feedbacks.

The online Student Response System (SRS) is developed as part of Botho University Katlego Feedback System project. The Katlego feedback system is used to collect learners' feedback *(quarterly)* online for evaluating learning/teaching for a course. Instead of soliciting for feedback at long time intervals, the researchers propose that a component be added to Katlego Feedback system to provide the following functionalities;

- Broadcast a multiple choice questions (MCQ) to the students machines(clients),
- Allow students to submit their answers to the teacher's machine (server),
- Facilitate data collection, and active data processing,
- Prompt presentation of the collated data to enable real-time feedback to the teacher and students.

The sub-system of the main Katlego Feedback 360d is called Katlego Student Response System (KatSRS) and it enables students to respond to one-minute quizzes or MCQ's during a lecture. The real-time feedback collected thus enables the teacher to assess students understanding of a topic during a lecture. In the same manner, students can assess their understanding of the concepts being taught and argue their points out during discussion. This will further improve on the teacher's capability to provide necessary interventions on time if there is need to do so. Unlike traditional EVS that use clickers (Caldwell, 2007), and EduMeCCA. SRS that uses mobile devices and mobile services, KatSRS uses the intranet available in a classroom to collect real-time student responses (Sellahewa, 2011).

THE PURPOSE OF STUDY

The present study investigates the effect of KatSRS in engaging learners during a lecture. That is, the study aims to establish whether KatSRS can improve students' engagement during learning/teaching sessions. In turn, the study aims to show the effect of students' real-time feedback in assisting the teacher in assessing whether there is need for any immediate interventions if the majority of students did not understand the concepts. However rather than comparing two different tools in students' engagement, this investigation focuses on the use of the single KatSRS for this purpose. More importantly, we have sought to check if learners' engagement and experiences have been increased as compared to when normal forms of teaching/learning are used. We may expect using the KatSRS tool to have a significant effect to learners' participation than when the traditional discussion methods are used in a lecture. KatSRS is expected to assist the teacher to gauge if the topic taught has been thoroughly understood as soon as possible than waiting for feedback from students during formative assessments conducted after the lecture or several topics of the course have been taught. For this purpose, we formulate the following hypothesis:

- H_0: Students' engagement and experiences would not vary much with the application of KatSRS in active learning/teaching as compared to the traditional discussion methods.
- Using KatSRS would not enhance learners' participation or impact on their experiences in learning under any context of its application.
- The teacher may not get useful feedback from this approach for improving his/her class delivery methods.
- H_1: Students' engagement and experiences from the use of KatSRS should significantly increase when compared to the known traditional methods of engaging students.

IMPORTANCE OF THE STUDY

The main premise of the study is to develop and pilot an educational system that will promote active learning and increase students' participation. The well-planned activities conducted via the students' response systems are likely to maximise students' participation and hence cultivate a positive attitude towards school amongst students. The study will also help in increased student-teacher interaction through encouraging students' responses and justifying their points
This will also result in the collection of real-time feedback by the teachers. The students' response system will enable the teachers to collect real-time feedback and measure the success of learning/teaching during a lecture or soon after a session. Eventually, this practice would equip the modern teachers with the ability of gauging the efficiency of their teaching every time they are in class.
Finally this study will assist in increasing Students' motivation and retention rates.

STATEMENT OF THE PROBLEM

There are students who find it difficult to engage in class because of shyness, lack of confidence, lose of opportunities because some colleagues are dominating in all learning activities and the general expectation that they need to be quite while the teacher talks. Furthermore, experience tells, collecting real-time feedback is one of the major challenges faced by most teachers when they want to measure the success of learning/teaching.

AIM OF STUDY

The present study aims at investigating and determining the effects of KatSRS (which is a component of Katlego Feedback 360d system) in promoting learners' engagement in active learning. The study combines literature and analysis of data collected from the participants during the experimental study of the KatSRS and students evaluation of the tool before and after the lecture to arrive at the conclusion.

OBJECTIVES

The main objectives of the present study are to:

- Review related literature in order to establish the current trends and use of SRS systems for engaging students in learning,
- Establish whether KatSRS has an impact on changing learners' engagement as compared to the experiences of students with other approaches ,
- Determine if there is an improvement in student-to-student or student-to-lecturer interaction when KatSRS is used compared to when traditional approaches are used,
- Determine the most preferred mode of answering or interaction during a normal lecture.

RESEARCH METHODOLOGY

PARTICIPANTS

The study was carried out by the researchers among the first year students in the Computing Department studying computer science at Botho University (Francistown) in the 2011 – 2012 academic years. The sample group was formed considering the continuum behaviours of students ranging from dominant students to very passive students in class. However all participants have the same level of qualification (BTHIT-Honours Diploma in Information Technology and Business Skills) and therefore they have the same experiences in computing. The sample consisted of 80 students, 46(58%) are female and 34(42%) are male. Although there could be some variances in the socio-economic and cultural conditions of the participants, the majority of these participants are Botswana students and hence the prevalent condition is Setswana culture. The experiment was conducted at recap, during class and after class to examine how effective anonymous interactive feedback could improve engagement.

STIMULI AND APPARATUS

RESPONSE MCQ

Participants answered Multiple Choice Questions (MCQ) presented on the slides via KatSRS interface on the computer screens. The responses were then submitted online to the server and automatically saved. The responses of type ***[A, B, C, D, I don't know],*** or ***[True, False, Not sure]*** were used to enable students to easily pick an answer they considered most appropriate. All participants used college personal computers' to log onto KatSRS and select appropriate answers. At the end of each interactive window, the researchers collected the learners' responses from the server and viewed the summaries.

QUESTIONNAIRE

To collect feedback from students regarding the effectiveness of the KatSRS a questionnaire was used. Out of 80 participants 62 responses were collected and analysed. Due to such a small number, the researchers used qualitative feedback as the primary measure of effectiveness. Learners' feedback was collected in two ways: (a) a survey specific to the use of KatSRS in the Computer Systems Architecture (C1-CSA) and Mathematics for computing courses; (b) learners' view of the KatSRS system as a tool for collecting feedback at the end the ninth week.

DESIGN

The experiment was conducted by the researchers over 6 weeks (week 3 - 9) of Computer Systems Architecture (C1-CSA) and Mathematics for Computing (C1-MAT) courses. Before the first lecture in week 3, all students who took part in the investigation were alerted of the opportunity to take part in an informal assessment of teaching. The participants were also notified that the informed consent for the experiment would be provided in the 4th week. In the second lecture of week 3, participants were shown how to use KatSRS to respond to a MCQ provided by the teacher on the board. Class sizes varied from 18 – 38 students. During week 9, participants completed the KatSRS evaluation form during lectures to indicate how they feel about the online KatSRS.

During the lecture MCQ

Multiple choice questions were presented as hard copy, word document or slides every twenty minutes of the one hour forty-five minute lectures. Some of the examples are as follows:

Example 1(C1-CSA): *Which of the following characteristics table bests describes the behaviour of a JK flip-flop?*

FIGURE 1: SAMPLE MCQ'S FOR C1-CSA AND C1-MAT COURSES

A

$Q_{(t)}$	$Q_{(t+1)}$	Out_1	Out_2
0	0	0	x
0	1	1	0
1	0	0	1
1	1	x	0

B

$Q_{(t)}$	$Q_{(t+1)}$	Out_1	Out_2
0	0	0	x
0	1	1	x
1	0	x	1
1	1	x	0

C

$Q_{(t)}$	$Q_{(t+1)}$	Out_1
0	0	0
0	1	1
1	0	0
1	1	1

E

$Q_{(t)}$	$Q_{(t+1)}$	Out_1
0	0	0
0	1	1
1	0	1
1	1	0

E I don't know.

Example 2(C1-MAT): *Which binary number below represents the octal number (632)8;*

A. 11000011 B. 111110000
C. 110011010 D. 000111110
E. I don't know.

Recap MCQ's

Example 1 (C1-MAT): *Let P = {multiples of 3 less than 20} and Q = {even numbers less than 20}. Draw and label a Venn diagram to show the intersection*
Find *P* ∩ *Q* .

Answer:

A. *P* ∩ *Q* = {3,6, 9,12, 18}
B. *P* ∩ *Q* = {6, 12, 18}
C. *P* ∩ *Q* = {2,4,6,8,10, 12,14,16, 18}
D. I don't know

Example 2(C1-MAT): *Let U = {x : x is an integer, 4 ≤ x ≤ 20}, Q ' = {5,6,12,14,15,16,18}.*
Find n(*Q*)

Answer:

A. 17
B. 10
C. 7
D. I do not know

During 4, 5, 6, 7, 8 weeks, students were engaged by asking them to respond to MCQ's and the results of each question were displayed to the students (see Figure 2 for pooled results of example 1(C1-CSA). In the case of a high number of negative/incorrect responses from students, the topic is discussed immediately.

From the class activities the following results were found pertaining to the examples presented above. The following results are showing how students were responding to the above examples in class. In C1-CSA multiple choice questions all students participated. It does not show only the number of participants but also shows the distribution of the responses pattern as well as the correct answer showing how many actually managed to get it right or wrong.

FIGURE 2: SCREENSHOT OF THE POOLED RESULTS FROM C1-CSA MCQ

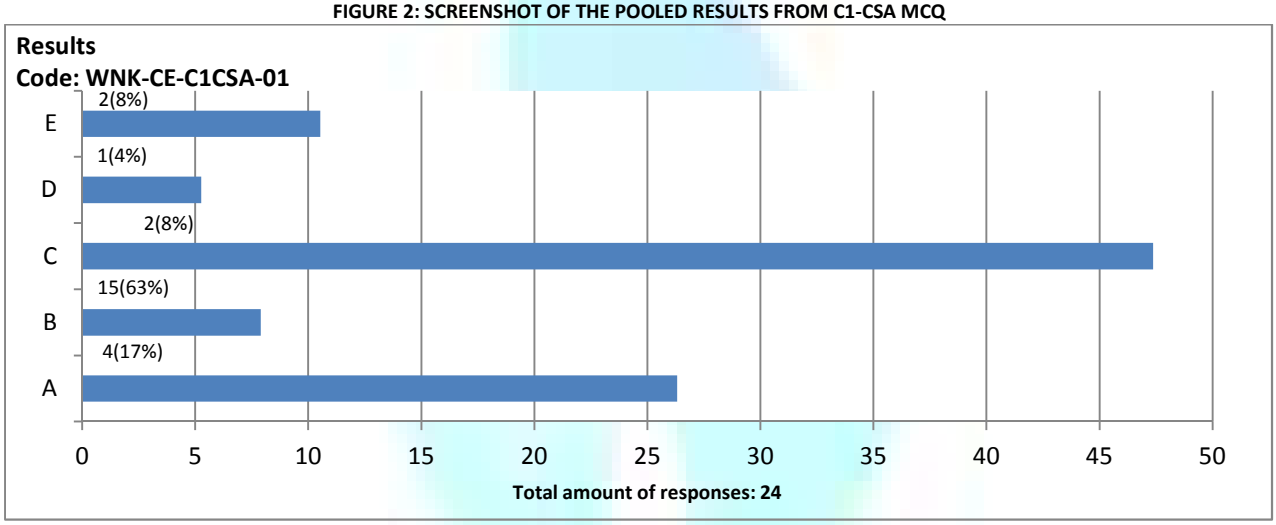
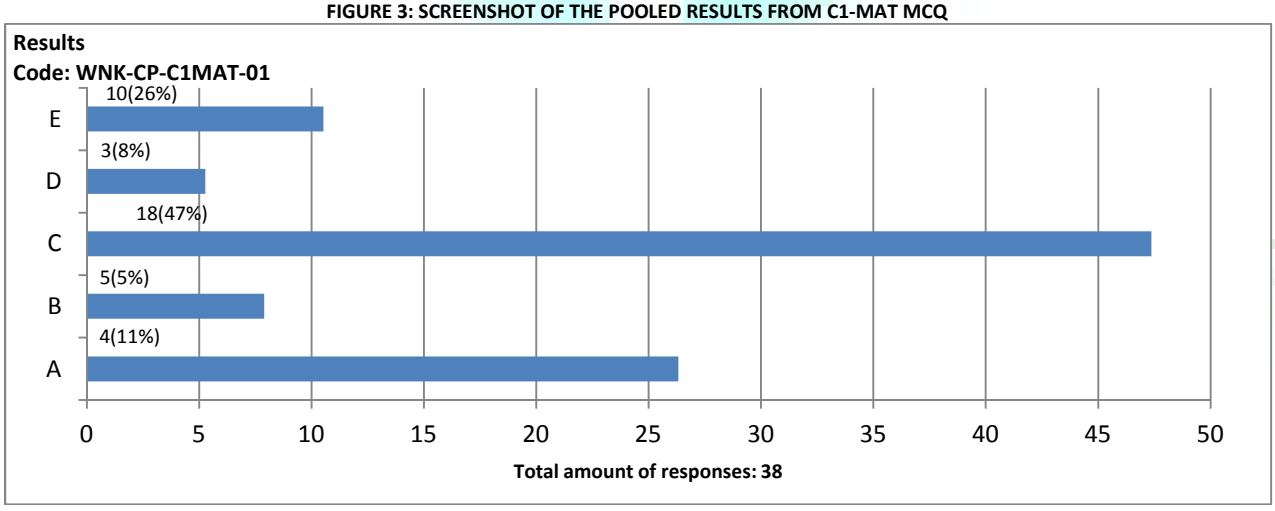


FIGURE 3: SCREENSHOT OF THE POOLED RESULTS FROM C1-MAT MCQ



RESULTS & DISCUSSION

The results are presented according to the tools that were employed. The first results are based on the survey of the participant learners followed by the selected interview results.

SURVEY RESULTS FOR LEARNERS' FEEDBACK ON THE USE OF KATSRS

Qualitative feedback was used as the primary measure of effectiveness since the sample group is relatively small and most of the judgment relied on literature. 27 out of 38 students that took the C1-MAT course responded to the survey and 35 out of the 42(both normal and progression classes included) students that took the C1-CSA course responded to the survey. In total, out of eighty students sixty-two (77.5%) responded to the survey. The details of the survey are summarized in Figure 4. The key points in the survey are:

FIGURE 4: SURVEY RESULTS FOR LEARNERS' FEEDBACK ON THE USE OF KatSRS

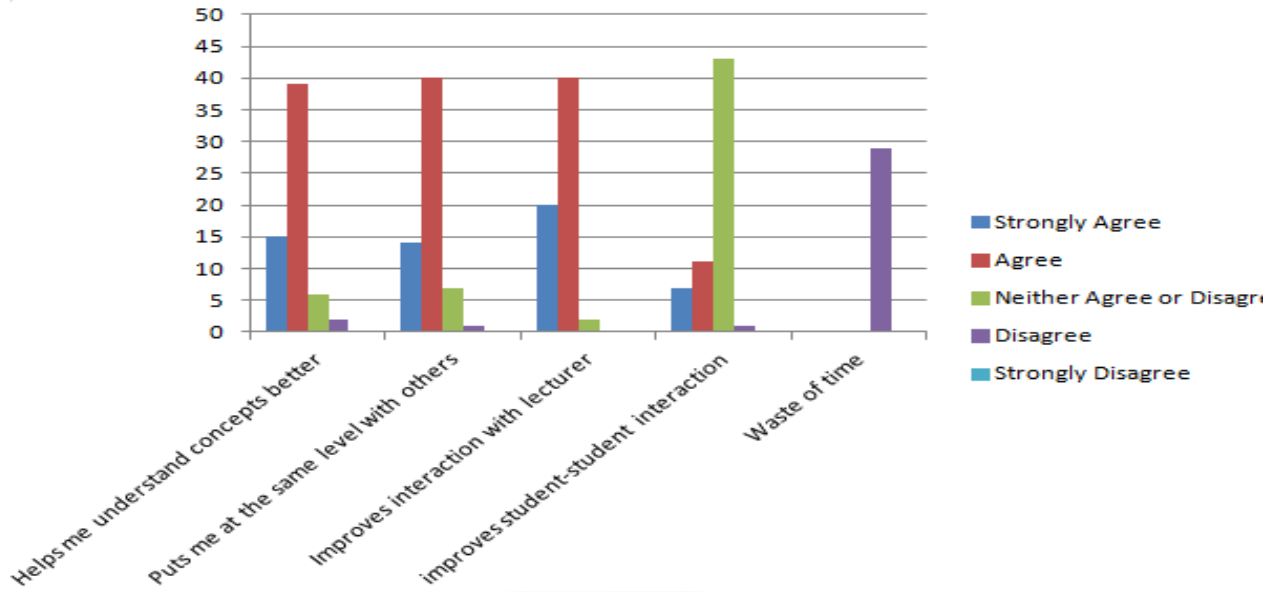
	Strongly Agree	Agree	Neither agree or disagree	Disagree	Strongly disagree
A) Review/Summary questionnaires before/after the lecture:					
1. Help me understand the concepts better	15	39	6	2	0
2. Help me discuss at the same level with the rest of the class.	14	40	7	1	0
3. Enables me to interact with the lecturer in the classroom.	20	40	2	0	0
4. Enables me to interact with the rest of the class.	7	11	43	1	0
5. It is a waste of time.	0	0	0	29	33
B) The online KatSRS system:					
1. It is a useful tool in learning.	45	16	1	0	0
2. Enhances my learning experience.	47	14	0	1	0
3. Integrates well with the lecture	40	16	4	2	0
4. Allows me to answer/interact, in the way I prefer.	35	4	20	3	0
5. Gives me an equal chance to answer questions than when a normal discussion is done.	37	13	12	0	0
6. Takes away the one-to-one contact with the lecturer.	25	10	9	12	4
7. It is a waste of time.	0	0	4	10	48
C) Frequency of answer/interaction – which of the following statement you agree with most?					
1. I am one of those in the class who always answer questions	20				
2. I answer only if the lecturer asks me or it is my turn	8				
3. I want to answer, but I do not get the opportunity	2				
4. I want to answer, but not in public	32				
D) Mode of answer/interaction – which of the following statement you agree with most?					
1. I am happy to answer in public	20				
2. I prefer to give my answer anonymously	39				
3. I do not want to answer at all	3				
E) The use of online SRS system					
1. I have used the system in one course	0				
2. I have used the system in two courses	0				
3. I have used the system in more than two courses	0				
4. I have not used the KatSRS system at all	62				

EFFECTIVENESS OF KatSRS

The findings presented in the survey show that out of 62 respondents:

1. 33(53%) of the respondents 'strongly disagree' with the suggestion that "Review/Summary questionnaires before/after the lecture are a waste of time" and 29(47%) of the respondents "disagree" with the same suggestion that "Review/Summary questionnaires before/after the lecture are a waste of time". None of the respondents think that the summary questionnaires are a waste of time;
2. 48(77%) of the respondents "strongly disagree." with the suggestion that KatSRS is a waste of time while 10(16%) "Disagree." that it is a waste of time;
3. Except for 1(2%) respondent, all respondents "strongly agree" 45(73%) or "agree" 16(25%) with the suggestion that KatSRS "KatSRS is a useful tool in learning.";
4. Except for 1(2%) respondent, all respondents either "Strongly agree" 47(75%) or "Agree" 14(23%) with the suggestion that 'KatSRS enhances their learning experience' ;
5. 32(52%) of the respondents said "I want to answer but not in public", 20(32%) said "I am one of those in the class who always answer questions.", 8(13%) said "I answer only if the lecturer asks me or it is my turn." and only 2(3%) said "I want to answer, but I do not get the opportunity.";
6. 39(63%) of the respondents said "I prefer to give my answer anonymously.", 20(32%) said "I am happy to answer in public." and only 3(5%) said "I do not want to answer at all.";
7. All 62 respondents said "I have not used the KatSRS system at all."
8. Furthermore, the screenshots for the pooled data for KatSRS used show that a hundred percent participation from all students presenting the Mathematics for Computing and Computer Systems Architecture groups. In the formal peer observations conducted in July to September 2012, the situation is different. The statistics show that when the traditional method of lecturing and discussion is used, only ten to twenty percent of the students manage to engage and make meaningful contribution to learning/teaching.
9. The feedback comments from the three classes where the KatSRS was used reflect that all sampled students appreciate the use of KatSRS and state that it was helpful especially in assisting them submit their responses anonymously.

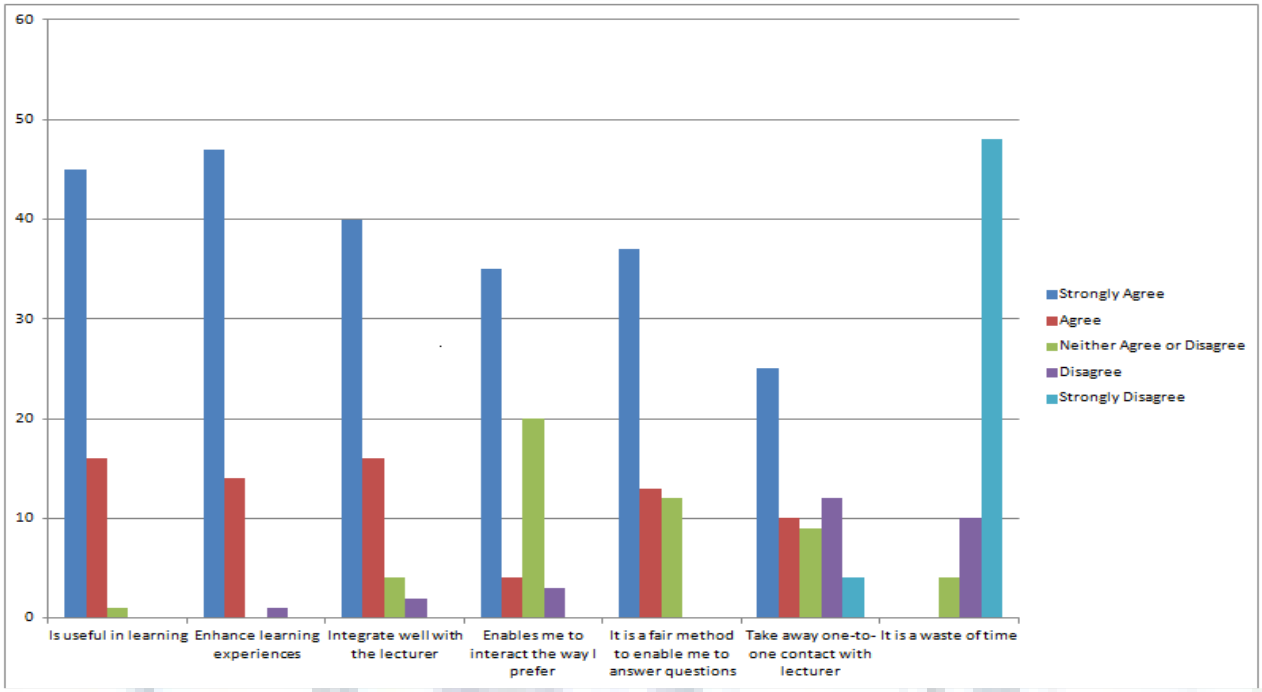
FIGURE 5: STUDENTS VIEWS ON THE USE OF KATSRS BEFORE/AFTER THE LECTURE



When figure 5 is examined, it is seen that most students either "strongly agreed" or "agreed" with the suggestion that KatSRS is a useful tool in enhancing interactions in class and increasing the ability of students' understanding of concepts. Notably, 47% of the students disagree with the suggestion that the use of KatSRS is a waste of time.

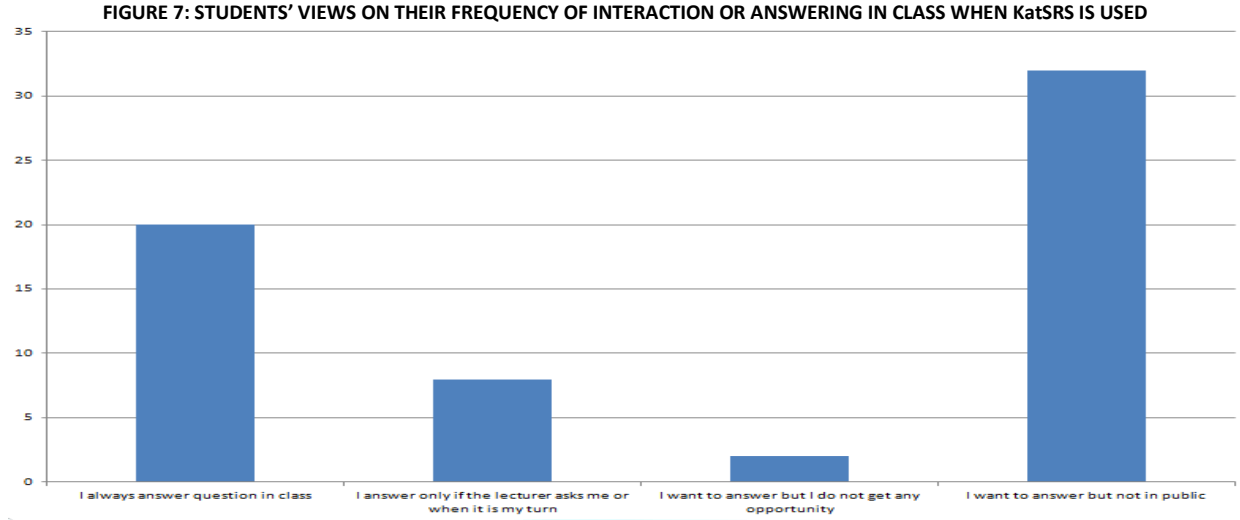
USE OF KatSRS IN LEARNING

FIGURE 6: STUDENTS' VIEWS ON THE INFLUENCE OF KATSRS IN THEIR LEARNING EXPERIENCES



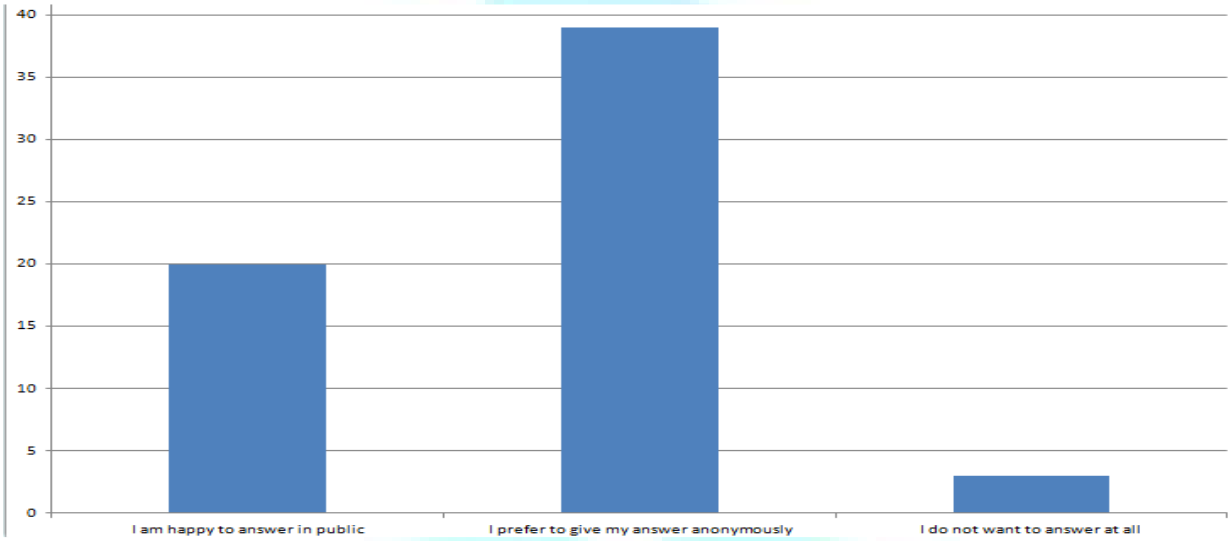
When figure 6 is examined, it is seen that there is a high number of students who strongly agree that KatSRS improved their learning experiences, gave equal chances to answer questions than if normal discussion was done and also they strongly agree that it enabled them a method of interaction they prefer.

FIGURE 7: STUDENTS' VIEWS ON THEIR FREQUENCY OF INTERACTION OR ANSWERING IN CLASS WHEN KatSRS IS USED



As can be seen in figure 7, they are more students 52% who would prefer to remain anonymous and 32% said that they like answering in class. The rest of the students prefer to wait for the lecturer to pick on them or they do not get the opportunity at all. This is an indication that KatSRS would be very effective on getting most students to participate in class since they seem to prefer it that way.

FIGURE 8: STUDENTS' VIEWS ON THE MODE OF INTERACTION WHEN KatSRS THAN WHEN TRADITIONAL



When figure 8 is examined, it is seen that the majority of the students (63%) prefer to answer anonymously in class, one-third of the students say that they are always answering in class and 3 students would never want to answer questions in public.

The results appear to be similar to the results obtained from the studies which aimed at investigating the effects of the students' response systems in engaging learners during teaching sessions (Caldwell, 2007; Sellahewa, 2011; Eric, 2005). It was also found that lecturers can benefit from the real-time feedback provided by students to construct on-time-interventional strategies (such as extended tutorials) if the concept is missed by most students during a lecture (Sellahewa, 2011; Eric, 2005).

According to our hypothesis H_0, there must be an even or less number of students who advocate for the use of KatSRS compared to those who do not favour its use. In the same manner, the same participants must have reflected their support for an open discussion mode than anonymity. In the present study, the researchers observed that there are more students who fear or deliberately avoid answering in public and prefer to respond anonymously. Based on the observation made from the survey results, we therefore do not have any evidence to support hypothesis H_0.

Hypothesis H_1 would be supported if the present study found that a high number of students support the use of KatSRS in active learning and provides them with equal opportunities to answer questions in class. Furthermore, if a high number of students strongly supported "anonymous" as the preferred mode of answering questions, then this would indicate the need for the KatSRS system and hence, H_2 would be supported.

In the present study, the researchers observed also considered the learner's feedback according to how the KatSRS influences their experiences and enabling interaction with their lecturers and colleagues. It was observed that more than two thirds of the students strongly agree with the suggestion that KatSRS is a useful tool in learning, enhancing their learning experiences and encouraging student-to-lecturer or student-to-student interaction. This finding concurs with the other studies based on clickers, online handheld devices and mobile services (Caldwell, 2007; Sellahewa, 2011). Accordingly we find strong evidence to support H_2.

The pooled results show a hundred percent participation from the students present in the Computer Systems Architecture and Mathematics classes during the administration of KatSRS tool. When the findings of the present study are examined, it is possible to argue that the KatSRS method enabled learners to be free to answer questions anonymously, provided students with equal opportunities for participating in class. In the case, KatSRS availed good conditions for active learning and increased learners' engagement. Studies by Dyson (2008); Caldwell (2007); Eric (2005) and Horowitz (2006) revealed that learners need to be encouraged by using appropriate interactive tools that protect them against embarrassment or any forms of prejudice or unfair criticism by other learners. This finding concurs with the literature Sellahewa, (2011).

For example, Dyson (2008) contends that asking learners to record their responses during interactive windows anonymously would attract more participation. Also recording these engagements throughout the lecture can act as a form of active and anonymous contribution to learning/teaching.

Furthermore, when the findings of the present study are examined, it is possible to argue that the online KatSRS system promotes lecturer-student and student-student interaction and removes barriers to participation (Horowitz, 2006; Sellahewa, 2011).

The influence of students' response systems in active learning continues to raise important questions. This study could provide some vital ground work for further research focusing on the strategies to circumvent practical issues prevalent in the application of students' response systems to facilitate learners'

engagement. Further research is needed on technology's role in the "classroom of the future" for both industrial and public education. At the other end of the spectrum, research into the learning of non-vocal students would also be valuable.

SELECTION OF STUDENTS' FEEDBACK

The following is a sample of some comments from the three batches doing Computer architecture and mathematics for computing. The comments were considered reflect students' feedback (relevant to the use of KatSRS) given as feedback for the course:

BFT12-F-CM022-01: "The introduction of KatSRS could be a very good idea especially to us who do not like to be public. I can contribute in class but now I cannot go in front of other students and show my ignorance." (C1-CSA- 2012 Normal Entry group).

BFT12-F-CM022-01: "This is a good system it helps us who are shy."; "I think all lecturers must try this it is friendly..."; "I like it because it made me participate in class."; "The Katlego student response system (KatSRS) is a very useful tool in gauging the understanding of materials flip flops."; "It's my first time to use this, but well I have no problems with it. But me I like the oral discussions in class." (CSA 2012- Progression group).

CP-MAT-B1: "This system favours students because I know many [colleagues] do not know but they shy to raise their hands and tell the teacher."; "So with this system, many of us indicated that we do not understand Cartesian product of two sets and the teacher explained again."; "The KatSRS system was a good way to involve the class"; "I liked the recap questions. I benefited because they reminded me of key points in sets and Boolean algebra." (Mathematics for Computing, 2012).

FINDINGS

- KatSRS is a useful tool in learning
- KatSRS enhances students' learning experience
- Most students do not want to answer questions in public/in front of their classmates but would rather remain anonymous during lectures
- There is 100% engagement when the teacher uses KatSRS compared to 10-20% participation when traditional methods are used.

LIMITATIONS OF THE METHODOLOGY

The benefits of the KatSRS are apparent but, there are some limitations that were identified in its application. These include the following:

- ***Connectivity and insufficient bandwidth:***

Network connectivity may be slow or not sufficient to handle multiple responses at the same time. Reliability problems may frustrate the users (Sellahewa, 2011).

- ***Administration of the process may be difficult***

Presenting questions and collecting the results may consume a lot of time (taking 5 - 10 minutes) (Horowitz, 2006). This becomes more stressing if there is slow network connectivity or other technical issues.

- ***Preparation***

Preparing for a lecture where the KatSRS is used requires more time to plan for appropriate questions: preparation of MCQ questions needs extra effort by the lecturer. According to Caldwell (2007) and Horowitz (2006), there is need for proper planning prior to conducting classes with students' response systems. For example, MCQ's to be given to students must be examined to ensure that they assess students' knowledge. Furthermore, questions must be challenging in order to stimulate prior knowledge and enable students to apply new ideas and explore implications.

- ***Overreliance on SRS tends to be detrimental***

If the SRS system is overused, there is the likely hood of overlooking at the other methods of learning/teaching (such as reflection, discussion and group work activities). The other methods could be handy because they reinforce skills and knowledge acquired. For example, in discussion and reflection, students are likely to concretise their ideas by discussing them with colleagues in class.

RECOMMENDATIONS/SUGGESTIONS

The present study established that interactive classrooms which use KatSRS system improve the learning process. This is because they facilitate class discussion, collection of data, promote critical thinking and increase student engagement (Caldwell, 2007). However, careful consideration must be done to ensure that there is proper planning, effective administration of the process and prompt evaluation of the process after the course for feedback. We therefore make the following recommendations;

Question design goals and tactics

Further research is required to determine how best we can design the questions for use during the lectures involving SRS. The questions should be structured such that they meet the pedagogical needs of the course such as;

(a) Having the ability to assess students' knowledge and (b) challenging to students so that they can improve on their experiences (Caldwell, 2007). A key research question in this context would be "What are the design goals and tactics for the SRS questions?"

Administration of the process

Administration and management of the process tends to consume more time than one would expect. According to Horowitz (2006), the lecturer requires ten to fifteen percent more time to cover the same number of learning points. An investigation needs to be carried out to determine additional resources that aid the teacher to easily administer the process without taking too much time.

Impact on student-student interaction

The ability of a learning/teaching approach to engage student-student interaction is the key to active learning. The notion behind KatSRS is not to eliminate discussions in class but, to find the best ways of making it more valuable to students. We therefore see the need for further research on how teachers can create an interactive classroom environment by posing challenging questions and positioning the discussions at the right times (Caldwell, 2007).

CONCLUSIONS

The exploratory study has shown that the use of KatSRS at Botho University (Francistown) can significantly improve learners' engagement and experiences. Notwithstanding there are many alternative interventions for harnessing learners' engagement (Dyson, 2008), the present research established that KatSRS can simulate a one-to-many dialogue, simplify instructor-student interaction and enable both the teacher and students to get prompt feedback. According to Caldwell (2007), the clicker based SRS have been shown to increase attendance, reduce attrition rates and promote student accountability. The need to engage an increased number of students in a lecture requires serious commitment from teachers because it is involving. More time would be required in planning for a lecture and therefore extends beyond normal working hours (Horowitz, 2006). In addition, a strategy needs to be formulated to introduce these technologies without distracting learners during a lecture. This requires some combined effort from the relevant ministries, university authorities and individual lecturers to identify appropriate educational technologies for promoting active learning and ensure that good learning/teaching standards are adhered to.

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REFERENCES

1. Biggs, J. & Catherine, T. (2007). Teaching for Quality Learning at University (2 ed.). UK: Open University Press.
2. Biggs, J. (2003). Approaches to learning in secondary and tertiary students in Hong Kong: Some comparative studies. . Educational Research, 6, 27-39.
3. Caine, R. N., & Caine, G. (1994). Making connections: Teaching and the human brain. New York: Addison-Wesley.
4. Caldwell, J. E. (2007). Clickers in the Large Classroom: Current Research and Best - Practice Tips. CBE- Life Science Education, 6 (1), 9-20.
5. Coull, N. J., & Duncan, I. M. (2011). Emergent Requirements for Supporting Introductory Programming. ITALICS , 10 (1).
6. Directorate-General (2007). The Republic of BOTSWANA European Community Joint Operational report 2007
7. Duman, B. (2010). The Effects of Brain-Based Learning on the Academic Achievement of Students with Different Learning Styles. Educational Sciences: Theory & Practice , 10 (4), 2077-2103.
8. Dunn, R., & Dunn, K. (1992). Teaching elementary students through their individual learning styles: Practical approaches for grades 3-6. Needham Heights: Allyn and Bacon.
9. Dyson, J. B. (2008). Assessing small-scale intervention in large-scale teaching: A general methodolgy and preliminary data. Active Learning in Higher Education , 9 (3), 265-282.
10. EduMECCA. (2011). EduMECCA SRS. Retrieved July 5, 2012, from http://srs.hud.ac.uk/srs/
11. Eric, M. (2005, May 17). Interactive 'clickers' transform classrooms. Retrieved September 24, 2012, from https://uwm.courses.wisconsin.edu/content/enforced/46141-srs_fac_devel/CNN%20Class... 01/24/2006
12. Habeshaw, S., Biggs, G. and Habeshaw, T. (1992). 53 interesting things to do in your seminars and tutorials. Plymouth: TES Books
13. Hart, L. A. (2002). Human Brain and Human Learning (3 ed.). Books for Educators.
14. Horowitz, H. M. (2006). Students Response Systems: Interactivity in a Classroom Environment. New York: IBM Corporate Education Centre.
15. Houghton, W. (March 2004). Learning and Teaching Theory for Engineering Academics. Exeter: Engineering Subject Centre.
16. Knight, J., & Wood, W. (2005). Teaching More by Lecturing Less (4 ed.). Colorado: Cell Biology Education.
17. Kolb, A. Y., & Kold, D. A. (2005). Learning styles and Learning spaces: Enhancing learning in Higher Education. Academic of Management Learning and Education , 4 (2), 193-212.
18. Linn, M. C., & Clancy, M. J. (1992). The Case for Case Studies of Programming Problems. Commun. ACM , 35 (3), 121-132.
19. Sellahewa, H. (2011). Using an Online Student Response System in Small Group Teaching: A pilot Study. Small Scale Interventions in Teaching-Learning , 10 (3).
20. Tumkaya, S., & Songul. (2012). The Investigation of the Epistemological Beliefs of University Students According to Gender, Grade, Fields of Study, Academic Success and Their Learning Styles. Educational Sciences: Theory & Practice, 12 (1).
21. Turugare, R., Dino, R., Sharp, H., Woodroffe, M., Blyth, R., & Schadewitz, N. (2012). A Frame Signnature Matrix for Analysis & Comparing Interaction Design Behaviour. HCI Conference , 136.
22. Zull, J. E. (2002). The art of changing the brain: Enriching teaching by exploring the biology of learning. Stylus.

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