Short Paper

Briefcase Recitation System with Random Name Generator: An Alternative Recitation Tool

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Abstract

Purpose – This research focused on the development, design, and application of the Briefcase Recitation system to lessen the problems encountered in the traditional way of classroom questioning.

Method – This study embeds the use of technology inside the classroom and is patterned after the popular "Deal or No Deal" game show. The system includes a random student name generator to pick the student who will answer randomized questions enclosed in briefcases within a specific time limit. Answers to questions are assessed and scored by the teacher using a rubric. Waterfall Model was used in developing the system and comprised of six modules, i.e., Questions, Participant, Databank, Scores, Timer, and Reports. The system was tested and evaluated using ISO 2196 Software Quality Model by 17 professors from Computer Science and Education Departments of Adamson University.

Results – The respondents assessed Briefcase Recitation System as highly adaptable which means that the system is functioning well and the features found in six modules are well presented. The respondents strongly agreed that Briefcase Recitation System is highly effective and adaptable in terms of functionality, reliability, usability, efficiency, maintainability, and portability. They also evaluated the system as an effective tool in improving classroom participation.

Conclusion – The Briefcase Recitation System can be used as an alternative tool in improving classroom participation of students.

Practical Implication – This research implies that there is a need for teachers to continuously innovate classroom activities such as classroom recitation.

Keywords – briefcase, recitation system, name generator, random, questioning

INTRODUCTION

   In the classroom setting, active participation in class discussions is an essential element of students' learning. When students speak up in class, they learn to express their ideas in a way that others can understand. When they ask questions, they learn how to obtain information to enhance their own understanding of a topic (Shore, 2015). The main purpose of recitation is basically to motivate students to take responsibility of learning on their own. Skinner (2016) suggests further that classroom participation encourages students to come prepared for class, to be active participants in classroom activities, and to think and reflect on issues and problems that relate to the class. It

also helps students to enhance communication and presentation skills whether individually or done by group, among others.

Traditionally, students volunteer to recite during class discussions. Students raise their hands if they know the answer posed by the teacher. If they do not, teachers either use the Socratic or the Fishbowl method. The Socratic Method is a dialogue between teacher and students, instigated by the continual probing questions of the teacher, in a concerted effort to explore the underlying beliefs that shape the students views and opinions (Chapman, 2016). On the other hand, the "fishbowl method" is a teaching strategy that helps students practice being contributors and listeners in a discussion. Students ask questions, present opinions, and share information when they sit in the "fishbowl" circle, while students on the outside of the circle listen carefully to the ideas presented and pay attention to process (Facing History and Ourselves, 2016).

Classroom participation or recitation is often part of students' assessment. After the teacher has successfully enjoined students to participate actively in classroom activities, the next challenge lies on assessing student's participation. The role of teachers in conducting recitation is challenging, because they are required to both facilitate and mark the learning (Skinner, 2016). Recent studies show that student contributions may also be affected by class size, group dynamics and other factors external to the purpose of the assessment.

Class size may affect assessment since classroom questioning will depend on the number of students per class and the class scheduling scheme. Conducting a Socratic Method type of questioning will not fit in a one-hour lecture class composed of 40 students.

Group dynamics like the Fishbowl Method, also results to unequal participation amongst students; giving ample opportunities to "non-shy" or outspoken students while inhibiting participation from the "shy-type" students. Students lost involvement because of a lot of factors. Students find it hard to switch from writing mode to questioning mode. If a teacher discusses 75% of the lecture time, students find it hard to raise questions because they are busy writing down notes. There are also observed difficulties shifting from listening to answering modes. If they cannot catch up, loss of pace occurs.

The current situation discussed above posed challenges in the administration of classroom recitation. To address this problem, a Briefcase Recitation was developed. The study designed, developed and tested the adaptability of Briefcase Recitation System as an alternative tool to the traditional way of conducting classroom recitation.

LITERATURE REVIEW

Time Pressure

There are a lot of factors affecting classroom participation like teachers' poses question after question which leaves very little time for the students to think (TeacherVision, 2017). The study of Freiberg and Driscoll (2000) further discusses that Teacher wait time and student think time are important ingredients to teaching and learning. The authors also noted that students with special needs require a few more seconds to think. In addition, gestures such as waving hands from other students or the hurry-up look from the teacher will cause many students to freeze (Freiberg & Driscoll, 2000).

Ingram and Elliott (2016) define wait time as extending the pauses between teachers' questions and students' turn to respond. Barry (2017) cites that wait time given is typically very short, somewhere between 0.9 and 1.5 seconds on average. Increasing wait time to 3 seconds or more results in noticeable differences in student participation. These differences include increased correctness and length of responses and an increase in the number of students that participates voluntarily (Barry, 2017). Based on these reviews, wait time and response time was integrated in this through the timer feature allowing teachers to set the limit from 5 to 100 seconds.

Random Name Calling

Rogers (1997) cited the problems in calling on students by name using the traditional method. These include students are reluctant to show off, dignitary entitlement issues, slows down class time, and pre-emptive

volunteering. The author suggests that all of these problems can be avoided by a transparent system of random calling. The author discussed the method of random name calling by putting each student's name on a regular playing card, shuffling the deck in class just before the bell rings, and taking cards from the top of the deck to call on students. Considering this literature and to avoid familiarity, names of participants included in the system are randomized.

The Popsicle Stick

Goodrich (2012) states that the Popsicle stick approach to student engagement can provide a more random selection for answers, which means that the consistent hand-raiser does not dominating classroom discussion. With the said approach, each student writes their name on a Popsicle stick and places all the sticks in a cup. The teacher will then ask a question of the class, draw a stick from the cup and have the student whose name is on the stick respond to the question.

Furthermore, the author discusses the benefits of this classroom technique. All-student (random) response systems like this engage all students and sets an expectation that all students are worth hearing, dispel notions of favouritism, and perhaps more importantly identify gaps in student understanding. This formative assessment strategy can give teachers the real-time, in class assessment information they need to better adapt instruction and meet student needs (Goodrich, 2012).

The use of actual Popsicle sticks has gone a long way. Today, there is already an existing mobile application patterned from this classroom assessment tool but instead of using actual Popsicle sticks and cans, the materials are now virtually done. Stick Pick is a mobile app where teachers can randomly (or intentionally) choose a student's name from a virtual can of Popsicle sticks (iPad Curriculum, 2016). The review of Khaltoff and Norman (2014) explains the features of Stick App which could be used as a formative assessment tool in the classroom. The question stems are categorized into three modes: English as Second Language (ESL), Bloom's Revised, or Bloom's. The ESL mode is designed for beginning, early intermediate, intermediate, early advanced, and advanced questioning. The Bloom's Revised mode is composed of questions intended for remembering, understanding, applying, analyzing, evaluating, and creating while the Bloom's mode is for knowledge, comprehension, application, analysis, synthesis, and evaluation type of questions. The app also features two types of rubric depending on the mode that was set by the teacher. For Bloom's and Bloom's Revised modes it is a Critical Thinking Rubric, while for ESL mode it is a Degree of Elaboration Rubric (Khaltoff & Norman, 2014). The mobile application Stick App has similar selection scheme as the briefcase recitation system, however, questions are already enclosed in the briefcases.

Rubrics

Peirce (2006) in his workshop presentation, states that rubric can be used to help professors evaluate different levels of student performance consistently and efficiently. It also lets students know what their professor is looking for and how to meet the expectation. Critical Thinking Value Rubric is one of the most commonly used rubrics. According to the Association of American Colleges and Universities (2014), these rubrics articulate fundamental criteria for each learning outcome, with performance descriptors demonstrating progressively more sophisticated levels of attainment. The utility of the VALUE rubrics is to position learning at all undergraduate levels within a basic framework of expectations such that evidence of learning can by shared nationally through a common dialog and understanding of student success (Association of American Colleges & Universities, 2014) However, the Critical Thinking Value Rubrics are intended for institutional-level use in evaluating and discussing student learning, not for grading. The use of scores from 1 to 5 is based on this rubric; however, the interpretation of such scores is based on what the teacher is trying to evaluate.

Conceptual Model of the Study

Figure 1 shows the Input-Process-Output diagram of this study. The input part of the diagram shows knowledge, software, hardware, and data requirements needed in this study. As a result of the review of related literature, the randomization of questions and name calling is based on the idea that familiarity should be avoided in conducting classroom recitation. Time limit was included as a data requirement based on the student's thinking time

and response time while the scoring scheme is based on critical thinking rubric. System requirements, design, testing, and implementation comprises the Process part of this diagram.
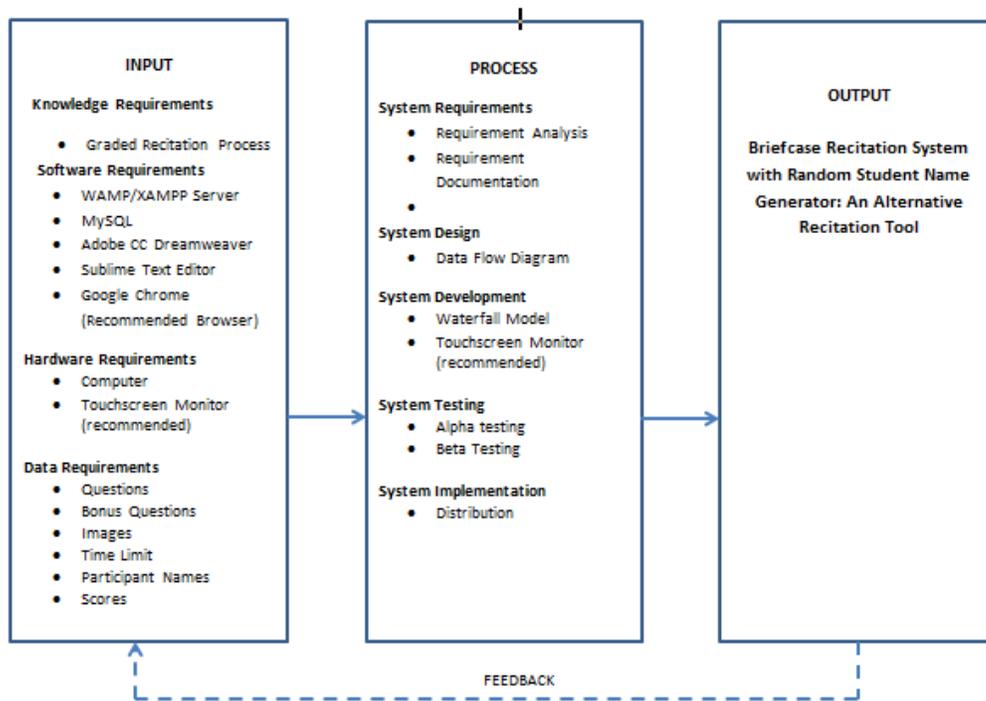

Figure 1. IPO Diagram

Requirements such as number of participants, time limit, question creation, and data archiving were the first set of documented requirements identified in this study. Data Flow Diagram was used to outline the system flow while Waterfall Development was used to develop and integrate the modules included in the system. Beta testing was conducted before distributing a copy of the Briefcase Recitation System considering the comments and suggestion of respondents from the Alpha testing phase.

METHODOLOGY

Research Design and Instrument

A descriptive research methodology was used in conducting this study. A survey questionnaire was designed to determine the respondents' perception on how the features of the Briefcase Recitation were presented in terms of functionality, reliability, usability, reliability, usability, efficiency, maintainability, and portability. A total of 23 indicators were included and rated using a 5-point Likert scale. These indicators were validated both by two Information Technology experts and one education expert from Adamson University. The survey questionnaires were administered to all 16 full-time and 4 part-time faculty members from the Computer Science and Education Departments. All faculty members participated in the study.

Software Development Methodology

The possibility of adapting the use of Briefcase Recitation System as an alternative classroom recitation tool is the main goal of this study. The Waterfall Model was used to develop Briefcase Recitation System. The following are the Waterfall Model Phases:

1. Requirements Analysis and Definition

The system's features, constraints, and goals are established by series of consultation with the respondents. Among the respondents' concern were the number of students per class, the type of questions, and time allowed for questions and answers. They are then defined in detail and served as a system specification. In order to understand and define the problem in existing classroom recitation, direct observation and unstructured interviews were conducted with the students and professors who have been using traditional way of recitation.

2. System and Software Design

After the requirements have been defined and thoroughly analysed, the Data Flow Diagram was constructed. Figure 2 shows the context diagram of the Briefcase Recitation System. From this figure, it can be inferred that there are two users of the proposed system; namely, the Faculty and Participants. The Faculty is the workhorse of the system doing most of the required tasks in conducting the graded recitation. These tasks includes creating questions, uploading images, setting countdown timers, importing class lists and arranging participants name. The Participants, on the other hand, refer to the students included in the graded recitation activity. The system was designed to:
   a. contain 40 briefcases taking into consideration the number of students in an ideal classroom setting,
   b. randomize questions to avoid familiarity when same material will be used for different classes,
   c. provide a timer which could be set from 5 to 100 seconds,
   d. customize questions following Bloom's Taxonomy type of questioning,
   e. customize content and allows uploading of pictures, videos, and/or hyperlinks to online sources,
   f. provide an accessible data bank of questions, and
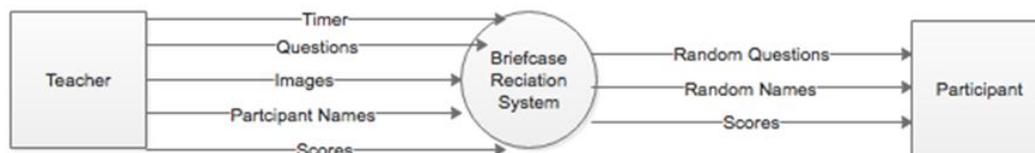   g. include a random student name generator.

Figure 2. Context Diagram

Figure 3 shows the Level 0 diagram of the Briefcase Recitation System. The figure shows the four main modules of the proposed system namely; Create Questions, Set Timer, Create Participants and Save in Data Bank. In the Questions Module, the faculty creates questions. The questions can be of any type and may have image attachment. The system can accommodate at most 40 questions, taking into consideration the actual class size. The system randomizes the location of questions in briefcases. This means that even the teacher will not know which briefcase contains which questions.

In the Timer Module, the Faculty has the responsibility of setting the timer from 5 to 100 seconds. The timer is set at this range with respect to the wait-and-response time as previously discussed in the review of related literature. In the Participants Module, the Faculty creates the list of participants which can be arranged randomly or alphabetically.

In the Save to Data Bank module, the recitation will be saved automatically once the window has been closed. Previously saved recitations can also be opened using the Restore Option. This allows the faculty to re-use recitations conducted in the past. In the Scores module, the Teacher will give the corresponding score to the student. The score ranges from +1 (lowest) to +5 (highest). The scoring scheme used was based on the Critical Thinking Rubric. Scores can be given by using arrow up and arrow down keys. The Reports modules allow the Teacher to generate reports of the graded recitation that was conducted.

3. Implementation and Testing

During this stage, the software design was realised as a set of program or program units. It included integration testing and acceptance testing. The additional features of the system will be tested separately for errors and bugs. Dummy values (questions, student names, and pictures) were used in executing this phase.

4. Integration and System Testing

The individual program units or programs was integrated and tested as a complete system to ensure that the system has met the standard requirements. This phase focused on the main features of the system which includes timer, questions, participants, and data bank modules.
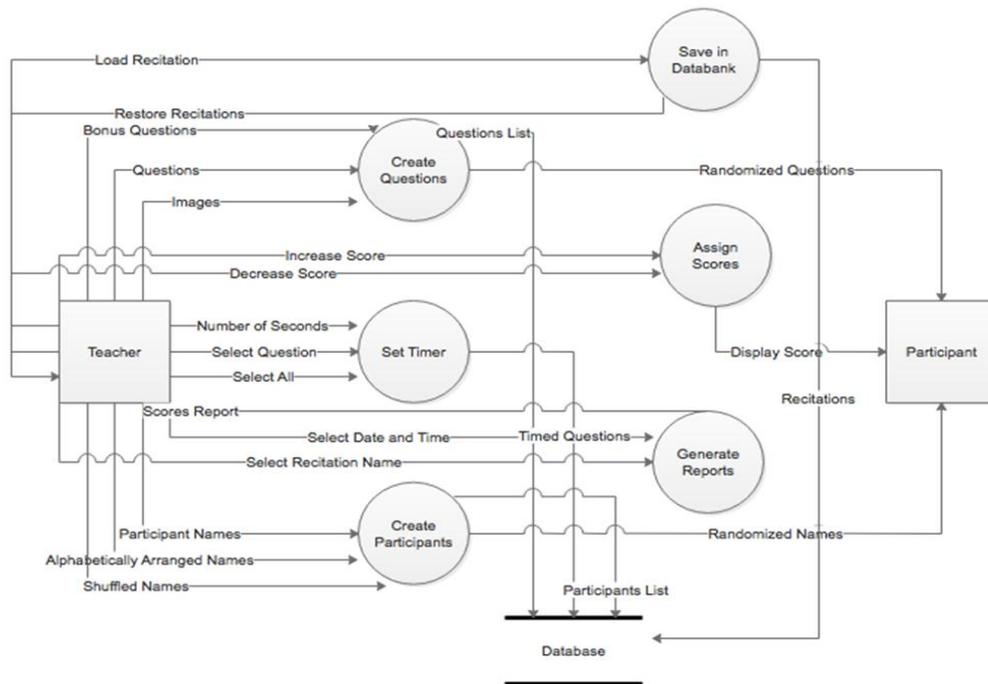

Figure 3. Level 0 Diagram

5. Evaluation

After the development, this study aimed to find out if the Briefcase Recitation System is an effective tool in improving classroom recitation and participation. The system was rated using ISO 9126 Software Quality Model with focus on functionality, reliability, usability, efficiency, maintainability and portability characteristics.

Statistical Treatment of Data

The data analysis consisted of examining the survey for correctness and completeness, coding and keying data in SPSS, and performing an analysis of responses according to frequency distributions and descriptive statistics. Survey forms with missing entries were discarded from the analysis. Frequency tables were constructed to display results. Mean and composite mean were used to interpret the respondents' perception as indicated in the survey questionnaire. The Likert scale (Table 1) was used to show the perception of respondents being surveyed in terms on the adaptability, reliability, usability, functionality, reliability, usability, efficiency, maintainability, and portability of using the Briefcase Recitation System. The Likert scale used 5 potential choices to determine the perception of the respondents.

Table 1. Likert Scale

Scale	Range	Interpretation
5	4.51 – 5.00	Strongly Agree
4	3.51 – 4.50	Agree
3	2.51 – 3.50	Neutral
2	1.51 – 2.50	Disagree
1	1.00 – 1.50	Strongly Disagree

RESULTS AND DISCUSSION

Assessment on the Adaptability of Briefcase Recitation System

Table 2 shows the assessment of the respondents on the functionality of Briefcase Recitation System. As shown in Table 2, the respondents have the same perceptions towards the system, that is, questions can be randomized (mean = 4.938), pictures can be uploaded to support better questioning (mean = 4.875), timer can be set from 5 to 100 seconds (mean = 4.813), question can be set to a specific time frame (mean = 4.875), questions are maintained in a database (mean = 4.875), auto-save feature is present (mean = 4.813), student names can be shuffled or alphabetically arranged (mean = 4.938), and briefcases can be hidden once they are already chosen (mean = 4.938). Thus, they all "strongly agree" based on the calculated mean values. Overall, the respondents submitted a composite mean of 4.833. This implies that the respondents "strongly agree" that the functionality of the system is acceptable to a great extent. The high evaluation rating can be attributed to the fact that this is the first time the respondents made used of a computerized game-format recitation system.

Table 2. Functionality of the Briefcase Recitation System

Indicators	Mean	Interpretation
The system can randomized questions and briefcases automatically	4.938	Strongly Agree
Pictures, Audio or Video can be uploaded easily to support questions.	4.875	Strongly Agree
The timer provides different limit options ranging from 5 – 100 seconds	4.813	Strongly Agree
Question can be set easily to a specific time frame depending on the difficulty level of questions.	4.875	Strongly Agree
The system maintains a databank of questions which can be retrieved anytime	4.875	Strongly Agree
The system helps save time and effort with the presence of "auto-save" feature.	4.813	Strongly Agree
Student names can be easily shuffled or alphabetically arranged in an instant	4.938	Strongly Agree
The system is capable of blurring briefcases once they are already chosen.	4.938	Strongly Agree
COMPOSITE MEAN	4.883	Strongly Agree

Table 3 shows the assessment of the respondents in terms of the reliability of Briefcase Recitation System. As shown in Table 3, majority of the respondents replied "agree" when asked if the system is reliable (system include no errors, mean = 3.938; a procedure level is maintained even when trouble occurs, mean = 4.250; and normal operations are restored readily when failure occurs, mean = 4.125). Overall, the respondents' computed composite mean is at 4.104 which mean they all "agree" that the Briefcase Recitation System is reliable. The evaluation rating can be credited from the error-free experience of the respondents when the system was tested.

Table 3. Reliability of the Briefcase Recitation System

Indicators	Mean	Interpretation
Modules are free from errors.	3.938	Agree
A certain procedure level is maintained even when trouble occurs.	4.250	Agree
Normal operations are restored readily, when failure occurs.	4.125	Agree
COMPOSITE MEAN	4.104	Agree

Table 4 below shows the assessment of the respondents on how they perceived the usability of Briefcase Recitation System. As shown in Table 4, most of the respondents replied "agree" (mean = 4.250) when asked if the systems design is attractive. The respondents answered "strongly agree" when asked in the usability of Briefcase Recitation System in terms of ease of the process in creating of questions (mean = 4.688), ease of use of the different features of the recitation system (mean = 4.750), applicability of the system to be utilized in other subjects (mean = 4.875), and re-usability of saved recitations (mean = 4.813). In totality, the respondents "strongly agree" that the usability of the system is presented to a great extent based on a composite mean of 4.675. The high evaluation rating can be attributed to the non-complexity of using the system. However, the minimal design of the system needs to be improved.

Table 4. Usability of the Briefcase Recitation System

Indicators	Range	Interpretation
The creation of questions is easy to understand.	4.688	Strongly Agree
The features of the recitation system are easy to adopt.	4.750	Strongly Agree
The system can be used to any subject when conducting recitations.	4.875	Strongly Agree
Application design is attractive.	4.250	Agree
Saved recitations are re-usable anytime the need arises.	4.813	Strongly Agree
COMPOSITE MEAN	4.675	Strongly Agree

Table 5 shows the assessment of the respondents on how they evaluated the efficiency of Briefcase Recitation System. As shown in Table 5, the target respondents replied "Agree" when asked if the system's response time, processing time, and the amount and type of resources used when performing the different functions meet requirements. The composite mean is 4.250. The evaluation rating can be credited to the ease performance of the system in terms of speed as demonstrated during the testing phase.

Table 5. Efficiency of the Briefcase Recitation System

Indicators	Range	Interpretation
The system's response time and processing time meet requirements.	4.250	Agree
The amount and type of resources used by the system when performing the different functions meet requirements.	4.250	Agree
COMPOSITE MEAN	4.250	Agree

Table 6 shows the assessment of the respondents on how they evaluated the Briefcase Recitation System in terms of maintainability. As shown in Table 6, the respondents replied "agree" when asked if errors can be easily diagnosed (mean = 4.125), system can be easily modified (mean = 4.250), and the system can continue functioning even changes are made (mean = 4.375). The composite mean is 4.250. The evaluation rating can attributed to the simplicity of the user-interface as demonstrated during the testing phase.

Table 6. Maintainability of the Briefcase Recitation System

Indicators	Range	Interpretation
The errors (if any) of the system can be easily diagnosed.	4.125	Agree
The system can be easily modified if the need arises.	4.250	Agree
The system can continue functioning even changes are made.	4.375	Agree
COMPOSITE MEAN	4.250	Agree

Table 7 shows the assessment of the respondents on how they evaluated the Briefcase Recitation System in terms of portability. As shown in Table 7, most of the respondents replied "agree" when asked if the system is compliant with portability standards. This interpretation is based on a calculated mean of 4.438. The respondents answered "strongly agree" when asked if the Briefcase Recitation System is easy to install, and if can be used to any platform. This interpretation is based on a calculated mean of 4.668 and 4.750, respectively. In totality, the respondents "strongly agree" that the portability of the system is presented to a great extent based on a composite mean of 4.625. The high evaluation rating can be attributed to the compatibility of the system to any different operating systems and platforms.

Table 7. Portability of the Briefcase Recitation System

Indicators	Range	Interpretation
The recitation system is easy to install.	4.688	Strongly Agree
The system can be used to any platform.	4.750	Strongly Agree
The system is compliant with portability standards.	4.438	Agree
COMPOSITE MEAN	4.625	Strongly Agree

CONCLUSIONS AND RECOMMENDATIONS

Based on the findings gathered, the following conclusions are presented.

1. The respondents assessed Briefcase Recitation System as highly adaptable which means that the system is functioning well. This means that the features found in the Questions, Timer, Participants, Data Bank, Scores, and Reports modules are well-presented.
2. The respondents strongly agreed that Briefcase Recitation System is highly effective, adaptable, and compliant in terms of functionality, usability, and portability. Further investigation can be conducted to improve the reliability, efficiency, and maintainability features of the system.
3. The respondents evaluated Briefcase Recitation System as effective tool in improving classroom participation. The respondents perceived that the system is a good alternative to the traditional classroom recitation.

In view of the findings and conclusions, teachers should consider adapting the Briefcase Recitation System with Student Name Generator as an alternative tool in conducting graded recitations to all subjects. The system should be enhanced in terms of reporting and analytics and the system should incorporate flexibility of accommodating different class sizes. This research implies that there is a need for teachers to continuously innovate classroom activities such as classroom recitation

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