ISSN (Online): 2455-3662
EPRA International Journal of Multidisciplinary Research (IJMR) - Peer Reviewed Journal
Volume: 10| Issue: 9| September 2024|| Journal DOI: 10.36713/epra2013 || SJIF Impact Factor 2024: 8.402 || ISI Value: 1.188

ONLINE PRACTICE TEST BANK SOLUTION: A WEB-BASED REVIEW PLATFORM FOR LIBRARY AND INFORMATION SCIENCE PRACTITIONERS

Cyndiarelle G. Abordo
Master of Science in Library and Information Science, University of Southeastern Philippines

Article DOI: https://doi.org/10.36713/epra18534
DOI No: 10.36713/epra18534

ABSTRACT

Test construction and test administration in most institutions still adopt the traditional pen-and-paper method of examination, which is very tedious (Kotwal et al., 2016). Its lengthy process can limit the time instructors in devoting to their proactive instruction and assessment. The general purpose of the study is to develop an Online Practice Test bank for Library and Information Science Practitioners. To actualize the Online Practice Test bank, the researcher followed the three phases of the modified rapid application model: Planning or Analyze Phase, Design and Development or Prototyping Phase, and Testing. The result of the study revealed that the developed system was able to execute its different operations. Specifically, by providing an avenue to the contributors/review masters and the reviewees to communicate and interact regarding the different reviewers provided. The reviewees can also track their progress through the learning analytics feature of the system. The contributors/review masters can monitor if the review materials they have provided has efficient test items by accessing the test item analysis. The system also has undergone functionality testing through conducting test cases, which have also gained positive remarks. Based on the results of the developed Online Practice Test bank, it is concluded that the system attained its three objectives in having integrated features that would be a great help, especially to the future licensed professional librarians as they will have a platform where they do their review and assess their knowledge on the six core subjects of library science. It is therefore recommended that mobile or android-based user modules must be developed for it to be more accessible to the users. And also an automated intervention or scaffolding for coping with the results from the performance of the review. And it must have an option or platform for contributors outside the institution who want to share their review materials relevant to the Library and Information Science profession.

INTRODUCTION

Test construction and test administration in most institutions still adopt the traditional pen-and-paper method of examination, which is very tedious (Kotwal et al., 2016). Its lengthy process can limit the time instructors in devoting to their proactive instruction and assessment. Fredrick (2016) stated that online examination can improve the standards of student's assessment, whereas the traditional examination system using pen and paper requires more effort on students and proctors. Also, frequent examination today brings lots of problems.

A research conducted by Agatep (2018), wherein he stated that in the traditional examination approach, several students expressed discontent with the fact that they were unable to know the results of their examinations immediately after taking them and that they were unable to assess whether or not they had truly learned the desired lesson. Furthermore, some students found taking an exam in the traditional manner to be exhausting. Others may be intimidated by their proctor, who is watching them while they take traditional examinations. All of the aforementioned situations resulted in low exam scores.

In 2016, a study was conducted at the Sanghavi College of Engineering in India, wherein they implemented an online examination system in place of a pencil-and-paper test. According to Kotwal et al., preparing exam questions is challenging, tedious, and time-consuming for the instructors. The current technologies may help instructors store the question banks in computer databases. However, the issue arises from how these technologies would also help the instructor's auto-generate the varied sets of questions from time to time without concern about repetition and duplication. James (2016) also added that the undergraduates at a university in Australia were familiar with the use of technology, but inexperienced in the online education environment and concerned about technical difficulties.

Furthermore, in the Philippines, a research was conducted in Jose Rizal Memorial State University (JRMSU) Tampilisan Campus in which they propose to develop a computer-based examination system for the agriculture and technology students who undergoes licensure examination to answer their problem in doing the inconvenient pen and paper examinations and review classes wherein there's no proper intervention in students' progress (Patayon et al., 2017). The traditional paper-based assessments often do not allow for the customization of questions. The questions used may be university-set queries or standards without instructors being able to add customized course-specific questions. Using paper-based assessments also doesn't afford much flexibility in terms of the reports that can be generated for instructors and faculty. Typical reports are often used without the ability to present results differently, whether showing results over time or across multiple courses. Explorance (2013) also stated that administering paper-based assessments in class may exclude certain students from participating. Students who are absent from class may not be able to access or complete the assessment. The lack of ability in accommodating all students in the process can lead to incomplete, distorted feedback with a very narrow view-point. Fredrick (2016) added that paper testing methods are prone to numerous anomalies such as time consumption, ineffective evaluation and supervision, bias and unequal monitoring, loss of paper, wasting of paper, and others. The time may also occur as one factor to be addressed because it will have a concern in preparation and administering in the right place and with maximum resources to consider (Sobejana & Diaz, 2016.

In the University of Mindanao Digos College (UMDC), they also developed an online test bank to serve as an aide in some board courses' general and professional subjects offered in their school. Sobejana and Diaz (2016) emphasized that the present scenario in motivating the student during the pre-review exercises of the

ISSN (Online): 2455-3662
EPRA International Journal of Multidisciplinary Research (IJMR) - Peer Reviewed Journal
Volume: 10| Issue: 9| September 2024|| Journal DOI: 10.36713/epra2013 || SJIF Impact Factor 2024: 8.402 || ISI Value: 1.188

graduating student is to review them then give them some drills just to make them more familiar with the different questions which are being made through the manual process (paper-made questions) which is very hassle. Also, faculty has a problem in creating sets of drills in terms of examination for questions that are not yet ready and not easy to access. Questions are also printed in a hardcopy form that may cause retyping of the questions and arranging them with different sets of drills. Creating different drills made the facilitator hard time to formulate and administer the drills. Progress of the students is also one of the burdens for it has many concerns like a number of participants and variety of subject that they can't monitor at once. Merced and Canang (2014) added that the fatal effect in taking the licensure examination is also a lack of intensive preparation before taking the test itself that may cause failure. They emphasize that in order to increase the results on graduates' ratings that have board examinations, the present dilemma of not having an intervention of easy monitoring to students performance during review classes and providing access to question banks at once must be addressed first. It is then the responsibility of review centers to continuously improve their practices may it be through constant monitoring, evaluation, and feedback. Administrators of review centers should also focus on competencies into looking at the students where they are weak at and these strategies can increase the examinees' chances in passing examinations (Lascano and Bansiong, 2017).

With the issues and concerns stated above, the researcher believes that the development of an online test bank can be a useful tool for future evaluations of a reviewee's performance, increase licensure examination passing rate, and provides information about achievements levels that enable the instructors to gain this information at a glance.

Moreover, online test banks have been studied within various fields; Information Technology, Engineering, and Agriculture. However, the focus has never extended to the Library and Information Science, and it is in this context, the researcher is interested in developing this system. Furthermore, the researcher believes that developing an online test bank solution for the Library and Information Science will be a big breakthrough in the field and would greatly help future librarians

OBJECTIVES

This study aimed to develop an online review course specific for Library and Information Science. Specifically, it aimed to:

1. Create performance feedback to provide immediate result.
2. Integrate test item analysis to provide result of responses of individual items.
3. Provides analytics on the progress of the reviewee.

METHODOLOGY

This chapter presents and describes the methodology and the details in the development of an Online Practice Test bank Solution: A Web-Based Review Platform for Library and Information Science Practitioners.

Modified Rapid Application Development (RAD) Model

Rapid Application Development (RAD) is an agile project management strategy popular in software development that emphasizes extensive user involvement throughout the development process. It is the effective and efficient creation of application systems within a full-fledged plan. Hirschberg (1998) define Rapid Application Development as adopting methodologies, approaches, and methods that can bring rapidity into the system development processes while maximizing development success factors. The success factors vary depending on the system, product line, organization, and consumers. Return on investment (ROI), cost of ownership, other performance factors, and customer satisfaction are all common success factors.

The method applied in this study is Modified Rapid Development (RAD). The phases include in this methodology were the Planning or Analyze Phase, Design and Development or Prototyping Phase, and Testing. The Planning or Analyze Phase includes requirements and task identification. The Design and Development or Prototyping Phase is where the design, development, refining, and building of the system, and the Testing Phase is the integration and system testing.

RESULTS AND DISCUSSION

This chapter presents the results of the current study. The following are the discussions of the outcome on each objective presented in the study.

In the development, the system was thoroughly analyzed on how it can be done and on what are the requirements and its main goal. After that, the developer started to design how the user interfaces look, planning how the database will be structured, and then implementing the design into source code through coding. The programming languages used by the developer to develop the system were PHP for backend and HTML, CSS and Javascript for the front-end side, and to be more specific, the developer uses Laravel, Bootstrap, and ReactJS frameworks which helps to achieve the structure in the system, and gives additional features without too much extra work. In the development, the developer uses a strong authentication method to improve security. In addition, the system also uses a single-page application (SPA) which is a web application that communicates with the user by vigorously rewriting the current web page with new data from the web server itself, instead of the default method of a web browser loading entire new pages to improve the performance of the system. The system developed had also undergone functionality testing by following the white box testing method. This structural testing technique designs test cases based on the information derived from the source code and has obtained positive remarks.

CREATE PERFORMANCE FEEDBACK TO PROVIDE IMMEDIATE RESULT

The Online Practice Test bank: A Web-based Online Review Platform for Library and Information Science Practitioners enables the review master/contributor to communicate with the reviewees and vice-versa, making the learning process more efficient. By just clicking the chat button on the lower right side of the system, a pop-up box for chat will appear together with the names of the contributor and admin that they can contact if they have queries. Figure 7 shows how immediate feedback happens in the reviewees dashboard.

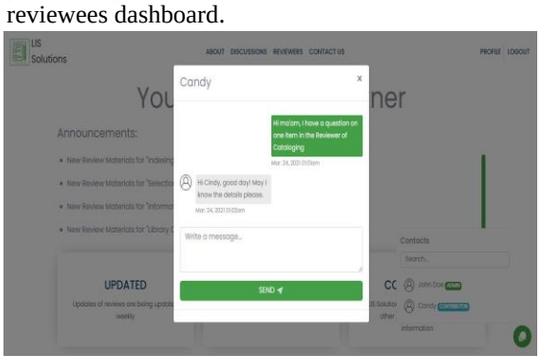


Figure 7. Feedbacking: Reviewees Dashboard

For the chatbox, the developer uses a modal, a plug-in from bootstrap, a dialog box, or a pop-up window displayed on top of the current page to highlight the messaging feature of the system. In the results and discussion, the developer uses "Pusher" as a WebSocket API. This sophisticated technology makes it possible

ISSN (Online): 2455-3662
EPRA International Journal of Multidisciplinary Research (IJMR) - Peer Reviewed Journal
Volume: 10| Issue: 9| September 2024|| Journal DOI: 10.36713/epra2013 || SJIF Impact Factor 2024: 8.402 || ISI Value: 1.188

to open a two-way interactive message session between the user's browser and a server to achieve real-time chat interaction between two users. By just a simple code on using Pusher, it can automatically listen to the message events and then displays to the chatbox either incoming/outgoing.

INTEGRATE TEST ITEM ANALYSIS TO PROVIDE RESULT OF RESPONSES OF INDIVIDUAL ITEMS

The Administrator and Contributor of the system can also view the test item analysis of the varied reviewers that the contributors provided. For them to assess what specific item/questions need clarification/enhancement. As shown in Figure 9, test item analysis result also updates whenever new reviewee/s takes a particular examination.

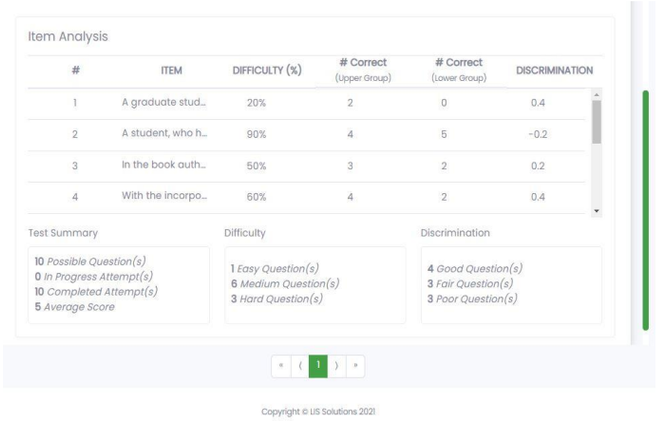


Figure 9. Test Item Analysis: Administrator's Dashboard

The data formulated from the Test Item Analysis was gathered from the system's database according to the reviewees' output. In the test summary section, the data are calculated based on each reviewer or exam's analysis. The Item Difficulty Index shows the percentage of students who answered the question correctly, with a high percentage signifying that the question was easy. To determine the Difficulty Index, commonly known as p-value, refers to the percentage of examinees responding to the item correctly. The p-value is calculated using the formula:

$$p = R / T$$

where p = the item difficulty index ;
R = the number of correct responses to the test item;
T = the total number of responses comprises both correct and incorrect responses

For example in the data in the test item analysis for item number 1, the total number of correct of students who got the item correct is 2 then divide by10 since there were 10 students who took the exam, then that would be 2/10 = 0.2 or 20%. Therefore, the Difficulty Index for item number 1 is 20% which signifies that it is a Hard Question. The same formula is also used in the rest of the items. A high p-value indicates an easy item.

PROVIDES ANALYTICS ON THE PROGRESS OF THE REVIEWEE

The system automatically generates learning analytics on the progress of review performance. Figure 10 exhibits the analytics that will show on the reviewees' dashboard. It presents the different percentages in the suggested three learning outcomes: Comprehension, Application, and Analysis that the reviewees have accumulated in the entire duration of their review. The time spent of the reviewee in a particular reviewer, its score, and number of items.

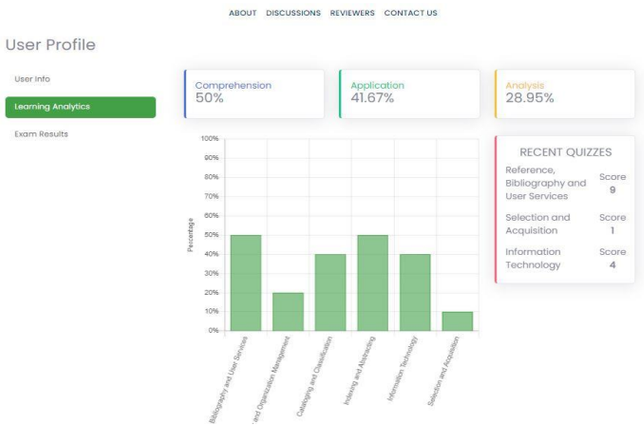


Figure 10. Analytics: Reviewees Dashboard

In the system, the data can visualize about reviewee's comprehension, application, and analysis. It is calculated based on each reviewer's questions to all subjects marked based on what type it's evaluated and the number of correct answers of the reviewee. For example, in the comprehension, there was total of 18 items that were evaluated for comprehension, and the reviewee was able to get nine (9) correct answers out of 18. The formula in finding the Percentage of Marks is being used to get the result. You divide the marks obtained in the examination with the maximum marks and multiply the result by 100 (Byju's,n.d.). Therefore,

$$\text{Percentage} = \frac{score\ obtained}{total\ no.of\ item} \text{ x } 100$$

$$= \frac{9}{18} \text{ x } 100 \quad = 0.5 \text{ x } 100$$

$$= 50\%$$

That is how it resulted in an average of 50% in comprehension. The same formula was also used to get the Learning outcomes for the Application and Analysis of every reviewee. In comparison, the bar graph shows the reviewees' score percentages per subject area. It is also calculated using the formula in finding the Percentage of Marks. Moreover, Figure 11 exhibits the analytics that will show in the administrators and the review master/contributors dashboard. It presents the user strengths, the user learning outcomes, and the User's/Reviewees Progress of each subject area.

CONCLUSION

The researcher achieved the objectives specified in the study, which is to develop an Online Practice Test bank. Based on the attained objectives, the following conclusions are given:

a) The review masters/contributors can have fast real-time feedbacking with the reviewees whenever the latter have questions/clarifications regarding the different reviewers/examinations through the use of the chat feature of the system.
b) The system can provide test item analysis visible in the administrator and contributors dashboard for them to make reports/findings on what part of a particular review question/s needs enhancement and distinguish what particular test item/s are to be revised or removed. The test item analysis is shown at the end of every reviewer.
c) The system automatically generates learning analytics that shows the reviewee's performance in terms of the user's strengths/weaknesses in the different subject areas, learning outcomes, and user/reviewees progress per subject area.

Based on the results of the developed Online Practice Test bank, it is concluded that the system attained its three objectives in having integrated features that would be a great help, especially to the future licensed professional librarians as they will have a platform where they do their review and assess their knowledge on the six core subjects of library science.

ISSN (Online): 2455-3662
EPRA International Journal of Multidisciplinary Research (IJMR) - Peer Reviewed Journal
Volume: 10| Issue: 9| September 2024|| Journal DOI: 10.36713/epra2013 || SJIF Impact Factor 2024: 8.402 || ISI Value: 1.188

RECOMMENDATIONS

Based on the study, the following recommendations are given:

a) For further development of the system, a mobile or android-based user module is also suggested.
b) An automated intervention or scaffolding for coping with the results from the performance of the review.
c) Provide an option or platform for contributors outside the institution who wants to share their review materials with relevance to the Library and Information Science profession.

REFERENCES

1. *Agatep, JLE (2018) Assessment of Traditional and System based Management Examination in Computer in AMA School, OlongapoCity, Philippines. CompterScience Information Technology.6(2).*
2. *Byju's (n.d.). How to Calculate A Percentage.https://doi./byjus.com/maths/how-to- calculate-percentage/*
3. *Explorance (2013). 6 disadvantages of traditional paper-based examinations. https://doir.org/explorance.com/blog/6-disadvantages-of-traditional-paper- based-course-evaluations-2/*
4. *Fredrick, F.T. (2016), The Core Element of Online Examination System. Headworld Technology Research.*
5. *Hirschberg, MA (1998), 'Rapid Application Development (RAD): A Brief Overview. Software Tech News. 2(1), 1-7.*
6. *James, R.(2016). Tertiary student attitudes to invigilated, online summative examinations. International Journal of Educational Technology in Higher Education.13(19), 1-13.*
7. *Kotwal, DV, Bhadke, SR, Gunjal, AS and Biswas, P. (2016). Online examination system.International Research Journal of Engineering and Technology.3(1).*
8. *Lascano, E. and Bansiong, A. (2017).Five-year licensure examination performance of Library and Information Science Graduates.AESS Publications.1(1), 1-9 https://doi.org/10.18488/journal.137.2017.11.1.9*
9. *Merced, B.M., and Canang, R.M. (2014).Determining the Factors Affecting thePassing Rate in the Board Examination for Librarians Using a Web- Based Instrument.PAARL Research Journal. 1(1), 1-24.*
10. *Patayon, U., Mandawe, C., Pagador, Pagador C.R.., Teopis, Yvonne M. and Quiboyen, EC. (2017). Computer-based examination system for the licensure examination of agriculturist. JPAIR Multidisciplinary Research. 29 https://doi.org/10.7719/jpair.v29i1.516*
11. *Sobejana, N. P., & Diaz, S. R. A. (2016). Project UMTB: UM Online Test Bank. Proceedings of the Annual Vietnam Academic Research Conference on Global Business, Economics, Finance & Social Sciences.*