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Impact Assessment of OER Repository of Bangladesh Open University

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1 Introduction

This article reports finding from a study with the students of Bangladesh Open University which replaced traditional textbooks prepared using in-house style with openly licensed books under creative commons (CC) license and other digital content such as video and audio lectures. BOU made a deliberate decision to make textbooks open for that were copyrighted under the Creative Commons license after adoption of OER Policy in 2014. This decision was based on the accessibility and flexibility in the delivery of course content provided by textbooks. In line with this the BOU developed a repository and subsequently it was upgraded through the technology support from Commonwealth Educational Media Centre for Asia (CEMCA). The Repository is now full operational and with motivation of assessing the impact of the OER repository, this study has been conducted. Main stakeholders of the OER repository are the students and in Besser et al. (1999) found while students generally view textbooks as an important element of their courses and it also help classes. Distance learners attend in the tutorial sessions, and the soft copy of the learning materials has been effective in the sessions as well. BOU provides hard copies of print which are normally delay in delivery. Therefore, the students are getting used to downloading texts from the repository. More students accessed open textbooks than had handed hard copies of textbooks. Higher grades were correlated with courses that used open textbooks at BOU.

2 Objectives

The main aim of this research is to assess the impact of the BOU OER repository. It also achieves the following:

- i) to describe how in this study OER-based textbooks provided benefits to students;
- ii) to ascertain how free learning materials increased student access to those materials;
- iii) to identify how the use of open learning materials (textbooks, videos, and audios) correlated with improved educational outcome.

3 Literature

Petrides et al. (2011) administered surveys to both instructors and students who used an open statistics textbook called Collaborative Statistics for courses of studies and they found open textbooks have potentials for new teaching and learning behaviours which include increased teacher collaboration on curriculum development and the interactivity of open materials as an enhancement of student learning. Open materials are actually, sometimes, termed as open media resources which may not be open educational resources for copyright issues. Open licenses maintains copyright issues properly. Therefore, subsequently, OER has been very important area for researchers. Bliss et al. (2013) surveyed with 11 instructors and 132 students at seven different colleges. They found 60 percent of instructors stated their students were equally prepared when OER replaced traditional texts and 30 percent said their students were more prepared. They also found of primary instructional materials can in fact be made available to learners at no or very low cost, without harming learning outcomes, there appears to be a major opportunity for disruption and innovation in higher education. These studies have found OER has positive impact on the achieving the learning outcomes. In the same year, Lindshield and Adhikari (2013) studied the perceptions of students who utilized a digital OER textbook in a Human Nutrition class. They found that students like using the flexbook instead of a traditional textbook because it is easy to use and helpful in their studies. Students also preferred the information

for other learning materials linked in the flexbook. Allen and Seaman in their Babson Survey (2014) affected 2,144 college professors regarding their opinions on OER. Of the 34% (729) who expressed awareness of OER, 61.5% of respondents said that OER materials had about the same “trusted quality” as traditional resources, 26.3% said that traditional resources were superior, 12.1% said that OER were superior. Jhangiani et al. (2016) examined awareness, usage, outcomes, and perceptions of OER among British Columbia post-secondary faculty. Julia et al. (2019) found in the 2017-2018 survey on teaching materials in U.S. higher education shows a steady growth in awareness of open educational resources (OER). Responses from over 4,000 faculty and department chairpersons paint a picture of steady improvement, with almost 50% of faculty now reporting OER awareness. The study also shows multiple factors are in place to support rapid future increases in awareness and use of OER. Faculty and department chairpersons believe that the high cost of course material has a negative impact on student access. In spite of that faculty report a growing acceptance (or even preference) for digital materials. At BOU, course materials have been made available at free of cost in the web. The literature survey reveals that the 'open' aspect of OER resonates with faculty; they see it as an excellent match to academic principles. The previous study results could signal a turning point for OER, with potentially higher levels of growth to come. Institutional initiatives to educate faculty about OER are limited, and faculty have been left to find their own solutions to the high cost of materials. Therefore, it is expected that BOU’s open accessed learning materials have positive impact on the learning outcomes.

4 Methodology

Bangladesh Open University has 12 Regional Centres (RCs) across the country, and the largest one is located in the capital city – Dhaka, named ‘Dhaka Regional Centre (DRC) which is responsible for 50% of enrollment. Students, normally, visit RCs for academic and administrative information on their programme. First, researcher personally visited and asked the learners to fill the questionnaire. In addition, a focus group discussion was held for this research in the RC library venue.

4.1 The Instrument and Participants

Study includes the students of different programmes of BOU. In this study, 5-point Likert scale was utilized to investigate the impact of BOU OER repository on learners learning. A total of 20 questions on attitudes with the distribution of 4 sub-topics of the OER impact assessment were used. In this study, the analytics of BOU OER reform, as a realm of University, is conducted to collect qualitative data as well. This paper explores the findings relating to teaching and learning through OER-based blended programme.

4.2 The participants

Students of Secondary School Certificate (SSC), Higher Secondary Certificate (HSC), bachelors, masters and other programmes participated in the survey. Fig 1 illustrates the courses of studies covered this study.

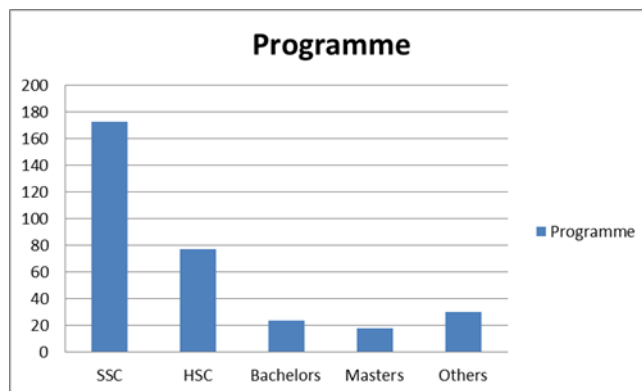


Fig 1: Programmes covered

As different programmes were covered and the age group of the students are also diversified. Younger students from the SSC programme contributed the lion share of the respondents. Age group of the participants is shown in the Figure 2.

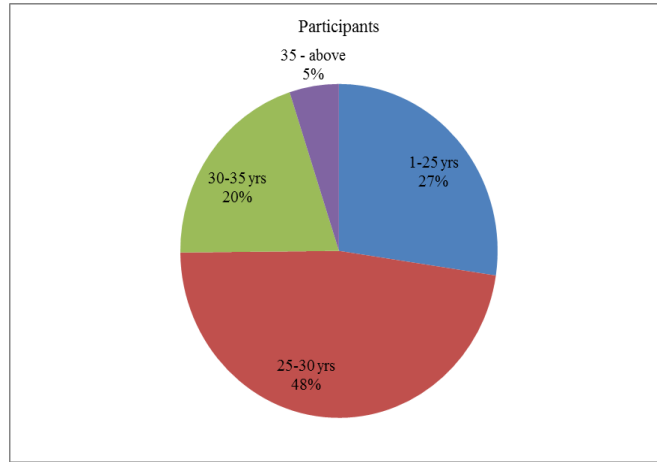


Fig 2: Age group of participants

Distance learners are supposed to be employed and/or self-employed. But, in this survey, 37% are of un-employed which may be for capturing the SSC programmes where most of the students are of unemployed. Fig 3 illustrates the employability of the respondents.

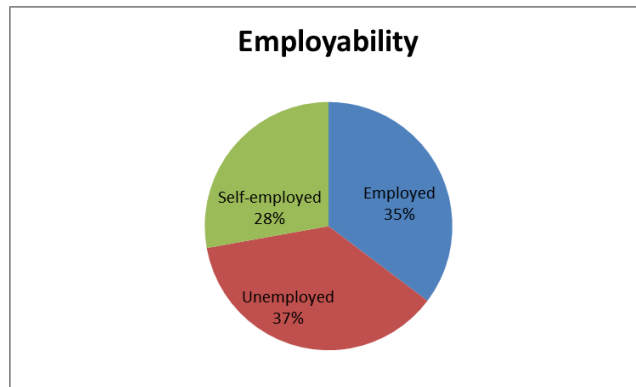


Fig 3: Employability of Participants

75% male and 25% female participants were participated in this study, and Fig 4 illustrates the gender:

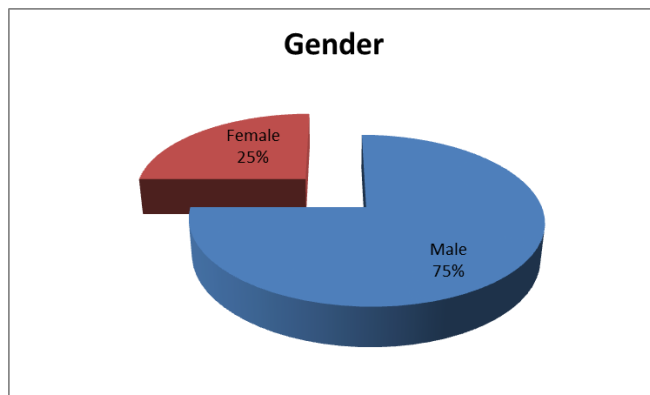


Fig 4: Male-Female ratio

4.3 Analysis

SPSS package was used to analyze data. Percentages (response rates, frequency), and mean and standard deviation of the mean for the Likert questions were calculated from survey responses.

5 The Findings and Discussion

5.1 Download pattern

BOU provided students with an access the digital content stored at the OER repository. Students have access to the materials anytime from any place without cost. It was also important to determine which resources the students were using. Students need not to have registered accounts to download files and BOU Website kept track of which files are downloaded. BOU repository stores three types of files: text, videos and audios. In order to determine what types of files students wanted to access is not only tracked the total number of downloaded files, but also the format of the file being downloaded. A 5-item questionnaire was adapted for downloadable attributes which was found to be a valid tool for assessing downloadable status in a previous by Feldstein et al. (2012). Each item, a Likert-type statement, assessed downloadable status of texts, video and audio. This also shows the sustainability of the BOU OER repository.

Table 1: Download pattern

Items	N	Mean	SD
I read the BOU online materials	303	3.72	1.43
I have downloaded information materials from the BOU OER Repository	307	3.86	1.31
I have downloaded text materials from the BOU OER Repository	300	4.25	0.80
I have downloaded video materials from the BOU OER Repository	304	4.17	0.78
I have downloaded audio lectures from the BOU OER Repository	302	3.49	0.70

FGD reveals that students are happy to download the materials from the BOU OER repository. Here are a few quotes representing these positive perceptions:

The learning materials and information are available in such a way that I can at the time, online available anywhere, at home in a textbook, video lectures to take to study. It made it easier to complete my studies even with a full time job.

I did not have to wait for hard copy of books as the text was available in the web and from anywhere I could download. I loved having the text online for free. As soon as I got admission, I downloaded the books and bound it for my studies.

I appreciate how “to the point” the online books are.

Table 1 illustrates that the learners download all matters stored in the repository; but learning materials (text, video and audio - mean 4.25, 4.17, and 3.49; SD is 0.80, 0.78 and 0.70 respectively) are of higher than that of downloading the information materials. It reveals that BOU OER repository’s downloadable status is high, and learners are fond of downloading the learning materials.

5.2 Impact of learning materials – video

Educational technologies are changing day by day and accordingly, learning theories are changing. By this time there are some established theories for framework of the analysis. The ‘cognitive theory of multimedia learning’ (Mayer 2014, Clark and Mayer, 2016) is an important because it tells the ways in which video assist or hinder learning. It also groups some key principles for effective video design, spelling out recommendations for the

interaction of visual, verbal and text-based content in video. BOU stores the video lectures in the repositories along with the broadcast on national TV channel.

Table 2: Impact of learning materials – video

Items	N	Mean	SD
I found downloaded video helped me learn	308	4.17	1.25
I found downloaded video is more congenial in using with compare to TV broadcast	328	3.93	1.38
I liked the how the video is linked to other video materials	307	4.22	1.27
I can use the downloaded video in the smart phone	312	4.24	1.26
I could use it in variety of learning environment	287	3.75	0.87

Carmichael et al. (n.d) found that a significant way in which educational video is having an impact on student learning is both through the benefits it provides in the changing teaching, and also in how it is having a direct influence in changing practices in teaching and learning more generally. Video provides great benefits to learners, stimulating stronger course performance in many contexts, and affecting student motivations, confidence and attitudes positively. Although video played a significant role in students' preference for BOU courses, students appreciated the improved learning environments. "Free access to learning materials," was the popular catchphrase. As one student said, "Last year, I got admission that was very challenging and I did not have the textbooks.... I did not understand what the reasons... are finally, I found books are available in the repository and it is set up in a way that I can learn."

Blended learning (BL) has been emerged and there has been a cited challenge with video use in course teaching generally is that too much use of unregulated open source digital content can lead to less curriculum structure which can, in turn, be problems in learning (Jackman and Roberts, 2014). BL offers pedagogical solutions where video-based learning is offered in both online and face-to-face, and is of very beneficial learning experience and outcomes (Kinash et al., 2015, Yousef et al., 2014). Definitely, the BL approach appears to be strongly backed as a preference of students (Ramlogan et al., 2014, Scagnoli et al., 2017, Mitra et al., 2010). In line with this, BOU offers the courses of studies through blended approach.

Table 2 illustrates the status of use of video lectures from the BOU OER repository, and the learners are fond of using the videos (Mean 4.17, SD 1.25). They also use the linked videos for their learning (mean 4.22, SD 1.27) and prefer to use in the smart phones (mean 4.24 and SD 1.26). It is important that they showed the agreement of engagement of various learning environment, and it shows that the use of videos in every subject area to demonstrate concepts, show students having real-life experiences, and connect students to faraway places. Video supplements the classroom and in this way, correlates with improved educational outcome.

5.3 Impact of learning materials - Text

Hilton et al. (2013) researched on OER were employed throughout different math courses at Scottsdale Community College affecting 1,400 students and they found Open textbooks promise the same educational benefits as traditional textbooks; however, their efficacy remains mainly untested. They also found that while there was likely no change in these learning outcomes, students who have access to OER materials collectively saved a substantial amount of money. Hendricks et al. (2017) examined the use of OER in a physics course at the University of British Columbia affecting 143 students and they completed surveys about the OER. Their finding was students reported using the open textbook with the same frequency as their traditional textbooks.

Table 3: Impact of learning materials - Text

Items	N	Mean	SD
Downloaded textbooks helped me engage with the study more than a paper textbook	311	4.72	1.09

I prefer digital content over that of traditional textbooks	303	4.09	1.28
Provided access to more up-to-date content than is available in my print textbooks	307	4.11	1.26
I liked the text are linked to other learning materials	306	3.67	0.96
I can easily use the downloaded print in the smart phone	301	4.29	0.94

Pawlyshyn et al. (2013) reported on the adoption of OER at Mercy College in New York affecting 695 students utilized OER in Mercy's basic math course, their pass rates were compared with those of the fall of 2011, in which no OER were utilized. They found positive OER has positive relationships with the learners' performance. They used a quantitative quasi-experimental design with propensity score matched groups and multiple regressions to examine whether student learning was influenced by the adoption of OER-based textbooks in place of traditional publisher-produced textbooks. Learners who used OER scored .65 points higher on end-of-year state standardized science tests than students using traditional texts when controlling for the effects of 10 learner and teacher covariates. Grimaldi et al. (2019) found that the access hypothesis states that OER benefits learning by providing access to critical course materials, and therefore predicts that OER should only benefit learners who would not otherwise have access to the learning materials.

Table 3 illustrates the impact of text materials stored in the BOU OER repository. Students reported that texts from the BOU OER helped them than paper text (mean 4.72, SD 1.09) as it is easily used in the smart phone (mean 4.29; SD 0.94). Students reported that OER provided the opportunity for using other linked materials (mean 3.67; SD 0.96). In this way, OER impacted on the achieving learning outcomes. For many years, BOU has used textbooks to explain concepts, pictures and visuals. These days most of our prints are found online as well and stored in the BOU OER repository which is like living text and are downloadable from any place, any time. Students can look at the headlines to have students practice how to find the main idea or write a great summary. They will begin to use critical thinking skills as they interact with real-life stories in the texts. In this way, correlates with improved educational outcome.

5.4 Impact of learning materials – Audio

Nynke et al. (2015) found that students used the recorded lectures as a substitute for lecture attendance, and the students who use recorded lectures as a supplement when developing a knowledge base score significantly higher on the assessment. Table 4 illustrates the impact of audio learning materials in the BOU OER repository on learning outcomes of learners.

Table 4: Impact of learning materials – Audio

Items	N	Mean	SD
Downloaded audio helped me engaging in study more	296	3.61	1.27
Audio is less helpful than video	305	3.34	0.93
I liked how the audio lectures are stored in the repository	302	3.90	1.25
Audio is easy to use	306	3.91	1.28
Audio lectures are content specific	297	3.39	0.97

Audio is least used materials at the Bangladesh Open University, and with compared to text and video as the responses are less in most of the items (mean 3.61, 3.34, 3.90, 3.91 and 3.39). The results showed positive impact on the learning outcomes.

6 Conclusions

The BOU OER goals were to improve access and give students flexibility for using the learning materials (text, video, and audio). Assessments across the OER at BOU showed improvement in downloading status. The literature on OER-based textbooks related to cost focuses on cost savings to students. BOU's OER materials are free of cost. Our study finds that taking advantage of the open license of open learning materials to make significant revisions

can be pedagogically useful and appreciated by BOU students, but it may require a good deal of time and resources because BOU normally makes delay in the delivery of learning materials and broadcast has been less useful. However videos in the repository are seen as having advantages for engagement in some specific ways, notably in widening participation and overall course engagement. This study attempted to correlate integrating OER-based print, videos and audios with improved educational outcome. The findings revealed that students thought the videos could help them to improve their learning which also confirmed the previous studies and the positive perception of students. The findings also revealed that using OER-based texts to support learning could enhance students' learning experience, motivation and engagement with the course content and proved videos are potential to satisfy the learning expectations by making the free downloadable from the repository.

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