

***Students' Perceived Barriers of the Use of OER:  
The Case of a South African Higher Education Institution***

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The European Conference on Education 2022  
Official Conference Proceedings

**Abstract**

Access to Higher Education plays an integral role in social and economic development and transformation. In South Africa, not only access to quality teaching and learning is influenced by the limited number of Higher Education Institutions (HEIs), but also access to resources. For HEIs in developing countries alternative resources than a prescribed book should be used to facilitate the teaching and learning of the academic programmes. Open education resources (OERs), as a teaching and learning tool, can assist lecturers to achieve the learning outcomes and facilitate the development of innovative teaching and learning approaches. Furthermore, the use of OERs can create opportunities for students in HEIs to increase their engagement with the discipline specific content. However, there are also several barriers that can hinder students in HEIs to capitalize on these opportunities. This study investigated the perceived barriers of the use of OER at a South African HEI. A self-administered online questionnaire was distributed in order to determine the perceived barriers of first year students completing a business management module at a South African HEI. Overall, 287 completed questionnaires were included in the data analysis. The results indicated the main factors that act as perceived barriers were social barriers, coursework barriers and technology concerns. The HEI should consider allowing for social interaction when OER is integrated in coursework, with adequate face-to-face sessions to enhance the learning experience of students.

Keywords: Perceived Barriers, Open Education Resources, Higher Education, South Africa

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## Introduction

The learning and teaching environment is changing due to the development and use of open educational resources (OERs) in various sectors, and the fusion of technology and creativity has made open education a growing trend over the last decade (Berti, 2018).

Different definitions of open education (OE) are accommodated within the general phrase "open education". In a study conducted by Dos Santos *et al.* (2016), OE is described as a teaching method that frequently uses digital tools. Furthermore, by reducing obstacles and ensuring that learning is available, plentiful, and customizable for everyone, the goal OE is to increase access and engagement for all by providing several opportunities for knowledge creation, knowledge sharing, and instruction. Additionally, it offers numerous entry points to both official and informal education and connects them (Dos Santos *et al.*, 2016).

The Hewlett Foundation more specifically describes Open educational resources (OER) as teaching, learning, and research materials in either digital or analog form, that is in the public domain or that are distributed under an open license. The use of OER may include no or few restrictions in the re-use and sharing of the material. McGreal (2004) defined OER as any digital content that can be re-used in a lesson, where the lesson may be organized into several units or modules or complete programs. Although different communities have varied definitions of OERs, the acceptable definition developed by UNESCO (2015) defines OERs as educational resources that are freely accessible for use by teachers and students without the monetary requirements or restrictions implied through royalties or license fees (Berti, 2018).

In relation to this, open educational practices (OEP) are methods that respect and empower learners as co-producers on their lifelong learning pathways, encourage innovative pedagogical models, and facilitate the (re)use and production of Open Educational Resources through institutional regulations (Ehlers, 2011). OEPs are typically acknowledged as possible facilitators of effectiveness, accessibility, and quality in HEIs (Weller, 2014).

OERs are quickly becoming crucial components in higher education. The integration and the use of OERs in HEI curriculums typically promote open educational practices (OEPs) and the open education movement (Berti, 2018). However, the number of HEIs that promote openness through official open education policies is still inadequate (Souto-Otero *et al.*, 2016). Even more so, the limited number of HEIs that emphasizes the development of lecturers' knowledge, motivation, and capacity to operate in the open education environment and increase the mainstream adoption of OEP is also concerning (Nascimbeni, 2015). Integrating OE and OERs is essential for HEIs as it serves as a stimulus for teaching and learning innovation using digital technology (Dos Santos *et al.*, 2016).

It is important to recognize the significance of OERs as educational tools that can support the global expansion of learning (McGreal *et al.*, 2013). An essential prerequisite for promoting the use of the content for education is the flexibility that openly licensed content offers in terms of both technology and law. The educational value of OERs and OEPs is fundamentally grounded in the idea of employing open-access materials as primary components of the academic curriculum (McGreal *et al.*, 2013; Berti, 2018). OE enables individuals to satisfy their educational needs at different life stages through accessing relevant and worthwhile educational opportunities for professional growth (Dos Santos *et al.*, 2016). OE provides flexible access to information, courses, support, evaluation, and certification (Dos Santos *et al.*, 2016).

Some of the advantages of the use of OERs include that access to free, high-quality, and affordable educational materials might increase fairness and performance in HEIs, OERs increase collaboration amongst peers, enable the user to develop modification capabilities, it expands the access to education, and implies cost reduction in access to education (Morris, 2019).

Over the past decade, OERs have grown steadily. Currently, there are creative and innovative OE projects taking place in HEIs all over the world. However, although the use of OER boasts several opportunities and advantages when considering the use of open resources in higher education, particular crucial challenges also exist (Berti, 2018).

According to Berti (2018), the barriers implied by using OER relate to the technical, economic, social, and legal domains. Although access to resources at any time and almost any place fundamentally enhances social equity through OE, not everyone may have access to broadband and other digital tools required to access open educational resources (OERs) (Berti, 2018). In addition, students and lecturers might not have the required and necessary technical skills to use the devices on which open materials are made available. In order to address this issue, it is imperative for HEIs to provide expert knowledge and assistance to help both students and lecturers successfully and seamlessly progress toward the use of OERs (Berti, 2018). Morris (2019) recognizes that barriers to using OER may include aspects such as concerns about the quality and reliability of the material included in the OER, as well as technology issues that may have a direct influence on the usability of the OERs.

### **Contextualising the use of OER in the South African HEI**

The North-West University (NWU) is an HEI in South Africa. The NWU is a unitary, multicampus HEI with campuses (Potchefstroom, Vanderbijlpark, and Mahikeng) in two different provinces (North-West and Gauteng) in South Africa, providing education in two teaching modalities: contact (face-to-face) and online (distance) (NWU Statute, 2017). Furthermore, the NWU as HEI aims to differentiate itself from its competitors for active scholarship and academic success. It also shows a desire to succeed in innovative teaching and learning practices in both the service delivery modalities offered.

The Faculty of Economic and Management Sciences is one of the eight faculties within the NWU. This faculty offers HE in fields such as management sciences, accounting sciences, economic sciences, industrial psychology, human resources management, and tourism management. One of the modules introduced in the first year of study within the faculty is Introduction to Business Management (BMAN111). The use of OERs was integrated with the BMAN111 module to ensure that students:

- experience innovative teaching and learning practices;
- develop autonomous learning skills where they can construct knowledge and understanding from different sources; and
- are enabled to take responsibility for their learning process.

A micro-course was developed based on specific content and outcomes within the BMAN111 module. This micro-course was hosted on the OERu-platform and students registered for the BMAN 111-module at the NWU was required to complete this micro-course within a 14-week time frame, at their own pace. The BMAN111 micro-course consisted of 6 learning pathways, each with its own outcomes and quiz that was used for assessment purposes. Although the micro-course was hosted on the OERu-platform, the quizzes for each learning

pathway was developed and hosted on the NWU Learner Management System (LMS). To successfully complete the BMAN111 micro-course, students not only had to work through each learning pathway and complete the quiz, but they also had to pass all the quizzes, and the results for each learning pathway quiz were calculated to determine a percentage that contributed 10% toward their final mark for the module.

In March 2020, the COVID-19 pandemic forced the HEI to move all teaching and learning efforts online. As a result, students registered for the BMAN111 module had to complete all their modules now online. The five weeks prior to the lockdown caused by the COVID-19 pandemic, students only had the OER component of the BMAN111 module to complete online. All other modules were thus presented in a face-to-face teaching modality before the COVID-19 pandemic. The COVID-19 pandemic resulted in emergency remote online teaching and learning at the NWU. This had to affect that students had to manage and complete all their modules online, which may have directly impacted their perceived barriers to using OER.

### **Research methodology**

This study sought to analyze the perceived barriers that prevent students at a South African Higher Education Institution (HEI) from using OER in for learning. For this study, a single cross-sectional technique and a descriptive research design were used.

### **Sampling Method**

The target population for this particular study was first year students at a South African HEI. The scholars who made up the target demographic were full-time students attending a South African university in two Provinces: Gauteng Province and the North-West Province. Thus, two of the campuses of the HEI made up the sampling frame. In the primary study, where a quantitative research methodology was used, 287 undergraduate students were included in a non-probability convenience sample. Additionally, a positivist strategy was used to assure the researcher's objectivity toward the study, data collecting, and research itself (Collins, 2010; Remenyi, et al., 1998). For the empirical part of this investigation, a descriptive research design was used.

### **Research instrument and data collection**

To gather the information required for this investigation, a semi-structured, self-administered questionnaire was developed and distributed. This was done in order to analyze the factors that act as perceived barriers towards the use of OER among students at a South African HEI from. The questionnaire parts were designed to collect information on certain demographic factors, and the respondents' perceptions of barriers in the use of OER. Twenty-four items were included in the questionnaire and analyzed based on students' perceived barriers of the use of OER, on a four-point Likert scale without a neutral point. This was done to encourage adherence to a particular viewpoint regarding the questionnaire item (Croasmun & Ostrom, 2011).

### **Sample description**

A total of 287 questionnaires that were completed and suitable for inclusion in data analysis. In the sample, there were more female participants (70.4%) than male participants (29.3.0%).

Only 1 participant (0.3%) indicated the non-binary option. Descriptive statistics were utilized to show a demographic breakdown of the respondents. The items included to determine the perceived barriers to the use of OER were also interpreted and investigated using exploratory factor analysis. Participants in this research study gave their consent before taking part. To safeguard the privacy and identification of the respondents participating in this study, no pertinent personal information was collected from them through the questionnaire.

### **Data analysis**

Following the coding of the completed surveys, the data was captured in Microsoft Excel. From there, Version 25 of the Statistical Package for Social Sciences (IBM SPSS) for Windows was used to process and analyze the data. Reliability and validity analyses, descriptive analyses, and exploratory factor analyses were included in the statistical analysis of the data collected for this study.

### **Reliability and Validity**

The Kaiser-Meyer-Olkin measure of sample adequacy and the Bartlett's test of sphericity were studied and utilized to determine the viability of principle components analysis for the exploratory factor analysis. The data gathered to ascertain the perceived barrier to the use of OER by students yielded a Kaiser-Meyer-Olking score of 0.957, proving to be highly acceptable (Field, 2009). At 0.0000, the Bartlett test ( $p < .00001$ ) was also found to be significant (Pallant, 2005). The exploratory factor analysis revealed three factors based on similarities between the items included to determine students' perceived barriers to the use of OER. Small correlations between the factors were revealed, indicating the individuality of the factors. Loadings of 0.45 and higher were typically used for item inclusion. Furthermore, an eigenvalue of 1 was used for factor extraction criterion. This is supported by Maree (2007). The eigenvalues of the factors included in this study ranged from 1.154 to 13.690. The three factors identified represents 69% of the total variance explained and the factors were labelled according to similar features of each item included in the specified factor.

### **Results and discussion**

Based on the questionnaire's four-point Likert scale, categorized items were used to identify each of the aforementioned variables. The Likert scale ranged from 1 (which represents 'completely disagree') to 4 (as 'completely agree'). Additionally, mean values for each factor were calculated in order to assess the relative importance of each factor identified. The following sections will provide an overview of the descriptive results of the sample demographic, as well as the results of the exploratory factor analysis.

### **Demographic profile of respondents**

From the 287 questionnaires included in data analysis, it is clear that the majority of the respondents from the sample were female (70.4%). Table 1 provides an overview of the aspects included in the demographic sections of the questionnaire.

Item	Variable	%
Sex	Female	70.4%
	Male	29.3%
	Non-binary	0.3%
Do you consider yourself as a digital native?	Yes	82.9%
	No	17.1%
How would you describe your ability to use technology?	Basic knowledge	28.9%
	Limited experience	19.9%
	Experience in practical application	34.1%
	Advanced skills and experience	13.9%
	Expert in the use of technology	3.1%
Were you familiar with open educational resources before the BMAN 111 module?	Yes	53.7%
	No	46.3%
Have you used any open educational resources before the BMAN 111 module?	Yes	40.1%
	No	59.9%
Have you ever used any other technologies for academic purposes, before BMAN111?	Yes	42.9%
	No	57.1%

Table 1: Demographic profile of respondents

From Table 1 it is clear that 82.9% of the respondents consider themselves digital natives. This refers to a person who was born or raised in the digital era and has had early exposure to computers and the internet. Furthermore, 34.1% of the respondents indicated that they have experience in the practical application in using technology, with only 19.9% indicating they have limited experience with the use of technology, and 13.9% indicating they have advanced skills and experience with the use of technology. The majority of students were familiar with OER before the use thereof in the BMAN111 module (53.7%) and only 40.1% indicating that they have used OER before the BMAN111 module. Forty-two-point-nine percent respondents also indicated that they have used other technologies for educational purposes, with the main technologies being social networking platforms such as WhatsApp and YouTube.

It is important to note that not all the respondents who participated in the research study completed the Micro-course and the quizzes included for assessment purposes.

Did you complete the BMAN 111 OERu micro-course successfully?	Completed the whole Micro-course and all quizzes	84%
	Did not complete the Micro-course or the quizzes	8.0%
	Completed the Micro-course and quizzes partially	8.0%

Table 2: Completion of the Micro-course

From table 2 it is evident that 84% of the respondents completed the micro-course and all the quizzes included for assessment purposes. In total, 16% of the respondents either did not complete any part or quiz of the micro-course (8.0%) or only completed the micro-course or the quizzes partially (8.0%).

## Exploratory factor analysis for perceived barriers of the use of OER

As mentioned above, three factors were identified for students' perceived barriers of the use of OER at a South African HEI. The factors were grouped together based on how comparable their features were. Social barriers (Factor 1), Technology concerns (Factor 2), and Coursework barriers (Factor 3) were identified as the perceived barriers. For each of the three factors, Cronbach's coefficients were investigated in order to assess the validity of the analyzed data and gauge internal consistency. The Cronbach's Alpha measurement for all three factors were acceptable and higher than the recommended limit of 0.7. (Field, 2009).

<b>Factor</b>	<b>Cronbach's Alpha</b>	<b>Inter-Item Correlation Mean</b>
Social Barriers	0.951	0.662
Technology Concerns	0.926	0.580
Coursework Barriers	0.875	0.586

Table 2: Exploratory factor analysis of students' perceived barriers of the use of OER

The first factor (Factor 1) labelled 'Social Barriers' included 8 items such as a lack of interaction with other students and lecturer, students felt isolated from lecturer and other students when using the OER, they were concerned about the validity of the form of teaching & learning and assessment that is done online rather than face-to-face, they experienced a lack of contact with other students, they were of the opinion that OER does not suit the way they prefer to learn, the impersonal nature of OER, the inflexibility of the course design, and they were concerned about the effectiveness of learning in isolation. This factor yielded the highest Cronbach's Alpha value (0.951) and inter-item correlation mean (0.662).

Factor 2 was labelled as 'Technology Concerns'. This factor yielded the second highest Cronbach's Alpha at 0.926 and the lowest inter-item correlation mean (0.580). Technology Concerns included six items: students experienced anxiety or stress related to the technology used, they experienced physical health barriers such as eye strain when using OER, students experienced various technical problems, they had an inability to work with computers, they experienced interruptions when completing the course, and they felt that they did not have the necessary information communication technology (ICT) skills.

The last factor identified was labeled 'Coursework Barriers' and yielded the lowest Cronbach's alpha (0.875) and second highest inter-item correlation mean (0.586). The items included in this factor were the fact that students found the amount of coursework they had to work through challenging, they felt it is not the right course for them, they experienced a lack of time to attend to the course, students experienced increased pressure of work in other modules, they found the content confusing, and finally they struggled to understand the content.

From the above it is clear that social barriers played the most significant role in students' perceived barriers to the use of OER. This implies that for the students registered at the South African HEI, one of the main role players in the preferred learning style is social interaction with their peers, as well as the lecturer. It is important to note that the integration of the use of OER in the first-year business management module (Introduction to Business Management) took place in the same semester that COVID-19 presented itself. These students were affected by this as there was a nationwide lockdown and the interaction with the lecturers and peers

were severely limited. It can therefore be assumed that the extent to which the COVID-19 pandemic limited social interaction among students (with reference to their academic work) played a significant role in how students perceived this as a barrier to the use of OER. Students did not have the opportunity to discuss the coursework included in the OER with their peers (which has a significant impact on how students construct knowledge of coursework) or their lecturers (where they can determine if they understand the coursework included in the OER).

Secondly, technology concerns also acted as a prominent barrier to the use of OER. Considering that HEIs' response to the COVID-19 pandemic and its impact on education was to continue with emergency remote online teaching and learning, it entailed that students had to complete the academic year in an online modality. Thus, students now had to complete all their modules online, whereas just some week prior to COVID-19 it was only some parts of some modules that included an online learning component. This logically relates to the anxiety and stress students experienced related to the use of technology, the physical health barriers such as eye strain from working longer hours on their computers, and various interruptions in their personal context as they attempted to complete the course.

With reference to the coursework barriers identified, students found this factor to play the least significant role in the use of OER. Thus, the social barriers and technology concerns were the two factors that influence their perceived barriers of the use of OER.

## **Conclusion**

From the literature based on previous research in the field of OER it is clear that OE enables HEIs to freely exchange educational materials or co-create them through open collaboration. The fact that educational content provided in the form of OERs decreases the limitations for the reuse and adoption of these materials attracts new audiences, such as students in HEIs. OERs furthermore enables flexibility in terms of how and when educational resources and instruction can be accessed as well as new methods of teaching and learning.

From the results of this study it is clear that the use of OER limits students' social interaction with their peers and lecturers, and that they have specific technology concerns when using OER for learning purposes. If the specific HEI in the South African context thus want to enhance the use of OER for teaching and learning purposes, it is important to include component in the integrations thereof that will allow for social interaction among the students (in the form of team work for example) as well as with their lecturers. Lecturers can, for example, ensure that they include Q&A sessions throughout the semester based on the OER-component of the module to guide students in the way that they construct knowledge and understanding from the coursework included in the OER, and also allow students to complete the OER micro-course in teams of 2-3 students. Future research possibilities exist as the OER Micro-course can be integrated again once the students return back to campus for normal face-to-face teaching modality and to compare the results with the results of this study to determine if the perceived barriers will differ if students now have less modules to complete in a fully online teaching environment (as was the case during the COVID-19 pandemic).



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