

A human-centred design approach to student success in a first-year high impact module

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Abstract

The success of students in the first year is an important concern for higher education institutions globally. Although much is known about the factors that impact on student success, not many authors have considered how to take such factors into account in the design of a module. In this study we report on a human-centred approach to curriculum design of a first year module in Education. Working from the perspective of the “typical first year student” as a proto-persona, we redesigned the learning management system interface, assessment plan, and support strategies offered to students. We report on students’ experiences of the module in terms of these three themes and discuss the implications for using human-centred design approach as a pedagogical tool and discuss ideas for further research.

Keywords: *Human-centred design, Design thinking, student-centred learning, UX design, commitment, mentoring.*

1. Introduction

Worldwide, education has seen significant transformation in the past three years. First, the Covid-19 pandemic, then ChatGPT at the end of 2022 forced educators to reconsider their teaching practices while simultaneously grappling with the impact of Society 5.0 on the purpose of education. Students in the first year of university must learn to adapt to the demands of university and many drop out in the second year.

Early identification is viewed as an important strategy to prevent early exits (Alyahyan & Düstegör, 2020). Significant strides have been made with widening access to education, but as Mishra (2020) points out, inequality continues to be an important problem for institutions with first-generation students and those with a migration background who are at a higher risk of dropping out (Miner-Romanoff, 2023). In recent years, education systems at all levels worldwide have reported challenges with declining success rates (Megbowon et al., 2023).

South Africa's education system in particular is vulnerable and school leavers' preparedness for further studies is often questioned (Soudien et al., 2022). The Covid-19 pandemic seems to have intensified this problem (Dorn et al., 2021). Some of the factors that impact on student success in the first year include difficulty *adapting* to the demands of university (Cameron & Rideout, 2020), *teacher-student relationships* (Human-Vogel & Mahlangu, 2009; Hagenauer et al., 2023), *self-regulation and commitment* (Human-Vogel, 2013), *personal identity* (Human-Vogel, 2008). Dropping out of university is the outcome of a mix of individual, institutional and economic factors (Aina et al., 2022).

One of the institutional responses to some of these challenges has been to focus on the role of learning management systems to promote student engagement (Veluvali & Suriseti, 2022). The migration to online delivery during the Covid-19 pandemic and thereafter transformed the teaching and learning space from a physical, synchronous space, to what (Dalgarno, 2014; 2015) described as a mixed, polysynchronous space years before. For a while now the use of hybrid teaching and learning strategies were opening new possibilities for designing *personalised* learning environments (Zhao & Watterston, 2021) that respond to the *diverse needs* of students (Robertson et al., 2018) and to encourage *deep learning* (Czerkawski, 2014). It requires universities to develop new pedagogies for effective teaching and learning, but we know that promoting active student engagement in hybrid environments is not that easy and can be hampered by a lack of innovation in teaching at universities (Børte et al., 2020). The Covid-19 pandemic showed that many educators were unprepared to migrate their courses to online learning environment (Adedoyin & Soykan, 2020). One of the reasons is that few educators understand how the design of learning in a digital environment transforms the learning experience for students and how to maintain a teaching presence in an online environment (Garrison, 2007). Because teaching is a complex activity drawing on many interrelated fields of expertise, and considering that educators are essentially designers of learning opportunities, Garreta-Domingo, Sloep and Hernández-Leo (2018) argue that educators can benefit from incorporating human-centred design practices into their teaching practice.

There are many different descriptions of human-centred design but what most of them have in common, is a goal-oriented process that involves developing an empathic understanding of the student's needs by listening to them, observing and empathising with them, or to create personas (Gualtieri, 2009). It is also a key aspect of user-experience design (UX design). In the present paper, we investigate how a human-centred design approach to curriculum development might lead to better student engagement and success to improve the student success rate of a first-year Education module offered at a South African university by using proto-personas as a basis for design. The project forms part of a collaboration with Carl von Ossietzky Oldenburg University (see Oldenburg & Hillenbrand in this volume).

2. Methodology

2.1 Research context

The research sample consisted of first-year students in Education from diverse socio-economic and language backgrounds and varying degrees of academic preparedness for university studies. Students' school backgrounds range from private well-resourced schools, to under-resourced schools that do not charge school fees. Our Faculty is large (approximately 9000 contact and distance education students) with large first-year classes consisting of multiple groups ranging from small ($n \sim 50$) to large groups ($n \sim 350$). We follow a hybrid teaching and learning model with both contact and online teaching, and we present the module using the Blackboard learning management system (LMS). The module we report on manifested a decline in the module pass rate – as the proxy for student success – from 88.6% in 2019 to 73.8% in 2021.

2.2. Research design

We used a qualitative and interpretivist lens (Denzin & Lincoln, 2018) and embedded our human-centred design into an action research framework (Cohen *et al.*, 2017) comprising one cycle of observation, planning, action, reflection, and evaluation. The study is part of a project focusing on human-centred design to ensure meaningful engagement and student success, and prior ethical clearance was in place. We collected data from 998 first-year students by means of a semi-structured, open-ended online questionnaire. In the present study we report on selected themes from the qualitative data using Braun and Clarke's (2013) approach to thematic analysis.

2.3. Barriers to student success

Understanding the context of our typical first-year student, we identified several barriers that were likely contributing to declining student success in the module. Firstly, learning in an online environment with an LMS requires network connectivity and access to suitable devices which not all students have. The LMS environment also requires a degree of computer literacy and readiness that not all students had, so the design of the LMS interface was an important consideration that impacted students' ability to engage with coursework, manage their time and complete assessments. Our institutional teaching and learning model emphasizes preparation prior to class attendance, which unintentionally led to a higher assessment workload. The intention was to ensure that students engage with the module content before class, but the result was that students spent too much time focused on assessment rather than actually preparing and engaging.

2.4 Human-centred design

From what we have observed regarding the challenges first-year students face, we attempted to develop an empathic understanding of the typical first-year student as our proto-persona by

using LMS data to (i) identify barriers to student success and (ii) to consider student engagement data to formulate hypotheses for what a human-centred curriculum prototype might look like. Coupled with student feedback, we then redesigned the LMS interface to accommodate varying levels of preparedness for university studies, computer literacy and motivation. It was important to accommodate a more flexible design in the module. Considering the barriers to student success for a typical first-year student, we redesigned the module by focusing on the following areas, namely (i) LMS interface, (ii) assessment load, (iii) student support and communication.

3. Results

3.1 LMS design changes

Regarding the *LMS Interface*, we streamlined the module content into more manageable sections, organising it under weekly folders with step-by-step activities to prepare, engage with content, and consolidate their knowledge. We used scaffolding activities for assessments and to facilitate the application of theory into practice. Comprehensive slide presentations of each week were available under folders. In virtual class sessions (synchronous learning) we used group work within online breakout groups, group presentations, and participation in discussion boards. Virtual classes were recorded for flexible access for those students who could not be in class. Students agreed that *the live sessions were [sic] helped me to interact with the lecturers and fellow students during those sessions; we participated in the live sessions and that it was not just a listening session but also a participate session*. One student emphasised the importance of attending the live WHY (We Help You) support sessions and stated that *these sessions helped a lot to complete my exam assignment*. The same respondent emphasized that *when I was misunderstanding something while working on the assignment, I was returning back to the recoding and listen on [sic] what to do so that I can complete the task that was confusing me*. A respondent asserted that *attending classes on daily [sic] basis and watching recorded lectures when I couldn't get to class really helped me a lot*.

3.2 Assessment approach

In terms of the *assessment plan*, we allocated 70% of the final mark to continuous assessment (formative assessment and feedback) and 30% to summative assessment and feedback. We reduced the number of online quizzes and replaced the online semester test with assignments that could be completed more flexibly. Students learned to apply the theory to practice through case studies and assignments intended to stimulate deep learning. One of the students said that *having continuous assessments and a portfolio instead of an exam as exams basically reflect what a student can memories [sic] the night before but continuous assessments accurately reflect if a student is understanding something or not and can be helped earlier then [sic] rather the week before the exam*. Assignments were available under the consolidate folder together with comprehensive planning and completion guidelines, assessment criteria and rubrics.

Students were given more flexibility to complete formative assignments in a week, and the summative assignment in three weeks. One student appreciated *the fact that we had sufficient time to complete assignments - and get clarity on what is [sic] expected of us*. Students received comprehensive feedback on assessments. Students noted that *she will give feedback on what you have written to give one a heads up on what to improve in [sic] or if one is doing good*.

3.3 Student support and communication

Support included individual online tutor sessions, after-hours content support sessions and instituted two intervention weeks to assist students with preparation for the semester assignment and the examination portfolio. We monitored progress by contacting students via email and telephone calls. National and international motivational speakers were invited to inspire students during challenging times. Students could use a Google form for suggestions to improve the module, and all staff were prepared to respond to students empathically. A human-centred approach focuses on creating a positive and supportive learning environment that meets the needs of students.

One student indicated that *my lecturer was one of the best I ever had. She was supportive, helpful and cared about the whole classes [sic] emotional, physical wellbeing*. Another felt that *my lecturer was a very loving and patient lecture [sic]. Her time and commitment to me, us and a class [sic] worked for me in this module*. Another respondent emphasized *how helpful the lecturer was, she would relate to us a lot which made us seem that we aren't [sic] alone because online learning can be difficult especially for first year [sic] students*.

The peer interaction that groupwork provided enhanced students' need for social interaction and learning and they reported that *you get teamwork skills enhanced and can see from peers how to improve the standard of your work*. A further student remarked that *the discussion board activities and in-class activities contributed to my learning and development by pushing me to think about the work and how I understand it*. This was confirmed by a student who said that *the discussion board helped in terms of helping me understand better and creating friends in the online learning platform*.

4. Discussion

The module pass rate improved from 73.8% in 2021 to 88.6% in 2023 and while we acknowledge that factors other than the design of the module may have contributed to this improvement, the feedback from students clearly indicates that they valued the focus on accessibility, support and communication. The changed design of the LMS interface increased accessibility and student engagement. Refining the module content with scaffolding activities facilitated a more student-friendly experience. Replacing timed quizzes to flexible assignments

as part of continuous assessment, received positive feedback and prioritized deep learning in favour of memorization, while providing opportunities for developing writing skills.

Our use of proto-personas helped to ensure that our design better addressed the needs of first-year students, but this “lightweight approach” must be followed up with the development of personas based on student-data (Garreta-Domingo & Hernandez-Leo, 2018), and the development of design prototypes that can be tested more objectively, such as with eye-tracking devices. Zhao and Watterston (2021) argue that education in the post-covid era should be more developmental and personalized and our pedagogy should be more student-centred and purposeful, especially because the recent accelerated the adoption of artificial intelligence by students and educators has transformed how we teach and learn and requires a reconsideration of what actually needs to be assessed. (Lo, 2023).

In general, education practices have transformed radically over three short years, and we think it is very likely that today’s students are very different to those who had just graduated from our institutions. Using a design approach to curriculum design necessitates a better understanding of who our “users” are, so we can better accommodate their needs and personalise modules to lead to meaningful learning. Co-designing with students could contribute to such personalised learning experiences, more meaningful learning and greater academic commitment. Zhao and Watterston (2021) urge us to make bold changes to our curricula, pedagogy and how we organize learning experiences. We think that a human-centred design approach can transform educators’s pedagogical practices by entrenching a design mindset and ensuring a personalized, student-centred approach to education.

Our study contributes to discourses addressing current challenges in education, particularly teacher education, in what some call Society 5.0 (Tavares, Azevedo, & Marques, 2022). Ensuring student success requires a different approach to the design of learning experiences. Existing pedagogical practices have to evolve to ensure we remain a human-centred and sustainable society amid rapid technological change. We think that a human-centred design approach can be a valuable transformative tool to navigate the complexities of teaching and learning in a complex world.

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