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Developing an Analytical Framework to Compare Students' Experiences of Online Learning with Indicators of Good Online Learning Site Design

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Abstract

Improving the student educational experience is the purpose of many scholarly studies of learning and teaching. While these studies have great value, there is still a need to further explore, beyond the conceptual, the relationship between what is pedagogically considered as 'good' elements of online learning design and what is experienced as 'good' learning. This paper presents a study that contributes to this gap by combining an inductive evaluation of online course design with a deductive analysis of students' level of satisfaction with their learning experiences. This comparison aimed to determine whether students' experiences align with educators' and learning designers' definitions of 'good' online learning. The paper provides a discussion of the study's design, which compared findings from students' feedback on their online subject units and the quality of the sites hosting these units determined using a validated design checklist. It provides an example of the framework's application and the results in the context of an Australian metropolitan university business school.

Keywords

Online learning; pedagogical design; student satisfaction; higher education; online course evaluation

Key contributions/Pathways to collaboration

- The research contributes a comparative analysis framework to the body of work that seeks to better understand the relationship between what is pedagogically considered as 'good' elements of online learning design and what is experienced as 'good' learning.
- The results are based on the analysis of online learning in a Business School. A comparison of the results from courses in other faculties would be useful.
- Further refinement of the framework could be achieved by including teacher data, such as their feedback on the tools and learning design instructions and student-teacher interaction.

Introduction

Online learning studies have produced a wide range of knowledge about learning and teaching experiences, pedagogies, and outcomes. Yet, empirical and methodological gaps remain in our understanding of how the people-centred and technology-centred elements of fully online courses interact to form the learning experiences. In particular, researchers have highlighted the need for conceptual studies that develop a better understanding of the relationship between fully online learning experiences and the learning design elements of the online learning sites, where students learn in formal higher education programs to validate the basic and additional course design dimensions and their impact on learning (Ichimura & Suzuki, 2017; Martin et al., 2017; Mayer, 2019).

The pre-COVID-19 studies that have combined a people- and technology-centred analysis of formal online learning higher education courses have mostly explored the performance or use of one tool or one aspect of a platform rather than focusing on the design of subject units or a complete online environment or examined online learning tools and environments with a focus on the presence or absence of elements of design (Martin et al. 2017; Martin et al. 2020). Much of the research published since the rapid shift to online learning brought about by the global restrictions introduced to address the COVID-19 health crisis is centred around students' experiences with online learning as a *mode of learning*, rather than on their experiences of *individual online courses*. These studies have focused on the benefits and challenges of studying online rather than how effective the design of a particular online course has been (e.g., Hollister et al., 2022).

Addressing this gap is important for several reasons. For example, studies that examine students' online learning experience assume the learning environment to be constant and students and staff to have a rational or compliant use of the environment, ignoring the impact of students' subjective perceptions of the environments and staff's adjustments and modifications of learning sites that alter learning design intentions (Oliver, 2002). Also, except for some studies of Massive Open Online Courses (MOOCs) that focus on key design elements of the learning experience (e.g., Ichimura & Suzuki, 2017; Stracke, 2017; Wang et al., 2021), most studies rarely examine the design of fully online courses. Rather, they study technological tools and platforms offered to complement or support face-to-face teaching and learning modes (Wallace, 2003).

We developed a framework to compare the findings from students' feedback on their learning experience in online subject units with the appraisal of elements of learning design of the unit's online learning environment. With this comparative method, we aimed to provide a comprehensive understanding of how students' experiences align with educators' and learning designers' definitions of 'good' online learning and, thereby, bridge the gap between theoretical frameworks and practical implementation.

In what follows, we first provide an overview of the limited body of literature that examines the relationship between fully online learning experiences and design elements. We outline the development of our method. Then, we illustrate the use of our framework by presenting an application and the results in the context of an Australian metropolitan university business school. We conclude by highlighting the next steps required to refine our comparative analytical framework.

Reviewing the field

There is a dearth of research into understanding the learning experience of fully online learning in regular credit-bearing university courses in relation to elements of online learning design. A survey of literature focusing on empirical studies and systematic reviews reveals a focus either on the people (Chen & Teh, 2022; Martin et al., 2020) the material (Wallace, 2003; Wilson et al., 2022) or the structural aspects (Claeys-Kulik et al., 2019; Martin et al., 2020). In addition, most of these empirical studies have either been 'observation-based' — gathering data about existing practices, tools, and behaviours — or 'intervention-based' — gathering data about a new intervention or the implementation of a new tool, activity, or pedagogy (Valverde-Berrocoso et al., 2020).

Three recent studies were, however, found that combine the methods of people-centred studies, which tend to examine how students perform in a given environment, their levels of satisfaction or how they interact with content, teachers and other students (Chen & Teh, 2022; Martin et al., 2020), with material-centred studies, which seek to validate a tool, its implementation and compliance with quality frameworks, or explore an online pedagogical approach or instructional learning design patterns and models (Wallace, 2003; Wilson et al., 2022).

In the first paper, Rienties and Toetenel (2016) analysed data from 151 modules and over 111,000 students at the Open University UK. This large dataset included under 400 million minutes of online behaviour, learner satisfaction, and academic performance, which was assessed using multiple regression models. Learning designs of the modules were mapped to identify the types and quantity of learning activities planned within the courses and data was collected on student interactions with the online learning environment, including time spent on various activities. Learner satisfaction was also measured, along with retention figures (completion versus enrolment) and other institutional data, such as course level, discipline, and class size.

The second study, by Clifton (2017), examined the learning design methodology of one UK Open University online module. This involved assessing both facilitators and barriers in applying learning designs and their impact on module development, delivery, and the resulting student and tutor experience. The study used a mixed-method approach, including surveys

with open and closed questions, to gather insights from students, tutors, and the production team.

The third study, conducted by Heinrich (2021), explored the application of Self-Determination Theory (SDT) to evaluate first-year university courses. The author integrated an established SDT scale, the Balanced Measure of Psychological Needs (BMPN), with two specially designed scales for evaluating course design features and perceived knowledge gains. The BMPN measures the fulfilment of needs rather than motivation itself. The fulfilment is posited to be a valuable indicator for positive influences on learning outcomes. Two additional scales were developed—one to assess the course design features and another for students' perceptions of their learning. In this study, students' knowledge was assessed at the start and end of the semester to evaluate the perceived effectiveness of learning design in terms of actual knowledge acquisition and confidence building.

All three studies underscore the critical role of learning design in enhancing the online learning experience. Clifton (2017) highlights the positive impacts of learning design on curriculum development, Rienties and Toetenel (2016) demonstrate its influence on student behaviour and performance, and Heinrich (2021) shows its effectiveness when evaluated through the lens of SDT. These studies also suggest that learning design directly affects student engagement (Clifton, 2017; Rienties & Toetenel, 2016), indicating that well-designed tasks promote active learning. Another key finding across the studies is the importance of communication in the learning process. Rienties and Toetenel (2016) note that time spent on communication activities is the primary predictor for academic retention, aligning with social learning theories. Heinrich (2021) also observes mixed results in peer interactions, which are crucial but can be challenging to implement effectively.

These three recent studies collectively highlight various learning design implementation challenges. These include issues around maintaining a strong pedagogical focus, catering to diverse student needs, and the lack of broader student information (e.g., key social and contextual factors) input in the design process. Further, Rienties and Toetenel (2016), Clifton (2017) and Heinrich (2021) recognise the need for further research, particularly in combining different forms of data to fully understand the impact of learning design on student experience and outcomes. Our study contributes to addressing this gap within regular credit-bearing university courses by comparing how students' experiences align with the evaluation of course design according to what educators and learning designers consider good online learning environments.

Developing the framework

To analyse how students' experiences aligned with the evaluation of course design, we developed a framework that combined established methodologies used to understand

students' experiences of online education (Fredricks & McColskey, 2012) and the nuances of teaching online (Kebritchi et al., 2017) with the investigation of technology and productive online learning environments (Castro & Tumibay, 2021), as well as learners and teachers' perceptions of online education (Palmer & Holt, 2009).

We hypothesised that this could be done by comparing the analysis of student feedback on the learning experience of online subject units collected via the university's online survey and focus groups, with the appraisal of the online subject's online environment or site, using an online learning site evaluation framework adapted from Johnson et al.'s (2019) second version of their Course Evaluation Checklist.

Student feedback instruments

The most common ways to gather students' feedback or self-report on their experience are through questionnaires, interviews and focus groups (Fredricks & McColskey, 2012). Although interviews and focus groups allow for the collection of in-depth data, these methods are difficult to implement on a large scale. For this reason, student surveys that include closed Likert scale-type questions are regularly used to gather data from large cohorts.

Most universities gather students' feedback about their educational experience using an online survey instrument either at the end of each subject unit taught and/or at the end of a course (Goos & Salomons, 2017). This data is used by each university to assess behaviours, outcomes and levels of satisfaction of their students and continually improve their educational offerings.

At this university, a standard subject unit survey (SUS) is administered each time a student completes a subject unit. This survey is voluntary and collects mostly quantitative feedback through Likert-style items that ask students to rate various aspects of their subject unit or course (e.g., the quality of teaching, feedback and assessments, the development of critical and analytical thinking skills, access to learning resources and support). Two free-text questions are also included in the SUS to gather qualitative feedback:

(1) What have been the best aspects of this subject unit?
(2) What aspects of this subject unit most need improvement?

These questions generate a wealth of qualitative free-text responses that not only provide rich and specific feedback, but also guide enhancements in teaching, curriculum design, and assessment. The study used these qualitative responses and sorted and coded the data to identify key themes and insights into the student learning experience.

To further explore the emerging themes, data was collected from student focus groups as detailed in the findings section. While focus groups are employed less frequently than surveys

due to their time-consuming and resource-intensive nature, they offer greater depth and elaboration of responses (Dart & Cunningham, 2023). Thus, focus groups allowed us to validate and delve deeper into the themes identified in the survey data, offering identification of potential group norms (Marvasti & Freie, 2017).

For our purpose, the focus group questions sought to elaborate on the two SUS open-ended questions. The questions asked students about (1) their overall experience of a subject unit, (2) their perceptions of specific subject units' elements of design, and (3) how they engaged with these elements.

A standard approach in social sciences and educational research to analysing qualitative data, such as the SUS and focus group data, is thematic analysis (Braun & Clarke, 2012). Specifically, the research team used an iterative approach to code data, assigning themes to the content of students' feedback and the associated sentiment. Individual members' coding was reviewed and discussed. In our study, in addition to this deductive analysis, the emergent themes and sentiments were subjected to a frequency count (Figure 1).

Figure 1

Steps in the Thematic and Sentiment Analysis of Student's Feedback on their Online Learning Experience

Thematic analyses require scrutinising data to allow themes to emerge and form coherent clusters. A wide range of themes emerged from our in-vivo analysis of students' feedback data that highlighted the importance of connection, content, context, experience, learning and teaching activities, look and feel of the learning environment, the organisation of the site, peers, individual needs and preferences, the online space, teaching staff, and the technology. These themes were examined to determine students' sentiments, which we defined in terms of levels of satisfaction with their online learning experiences (coded as 'satisfied' or 'dissatisfied'). For example, "the tutor was good," was coded as 'connection – staff – tutor' and assigned the sentiment of 'satisfied, or, "I found it hard to find the reading list," was coded as 'organisation – navigation' and assigned a 'dissatisfied' sentiment.

Based on students' survey and focus group feedback on subject units, we were able to extrapolate on whether they perceived the learning as: 1) content-centred; 2) teacher-centred; and 3) student-centred. For example, a student who commented, "The teachers just read from the slides [… and that they] had grammatical mistakes and were full of text," was extrapolated

to the subject being perceived as teacher-centred because the focus of the teaching and learning was on the teacher delivering content with limited interactions with students. A comment such as, “every week dive deeper into writing skills, it is easily absorbed and covered many of my doubts while I'm writing," was interpreted as pointing to a perception of a subject as content-centred and focused on a student engaging with content material with limited interaction with the teacher or other students. A student commenting that teachers changed the pace of lectures in response to students asking for a slower delivery to better engage with complex content and stating that, “If an error [in weekly homework activities] came up, lecturers would act on it with the interests of students in mind. This contrasts with other units where lecturers had little regard for the impact of errors on students,” suggested a student-centred approach as it highlighted greater engagement with students in the delivery of the content.

The themes and associated sentiment analysis were subjected to frequency counts to determine their weight or importance in relation to each other. These frequency counts were used to determine students’ overall perception of satisfaction with a subject unit (Table 1).

Table 1

Themes and Associated Sentiments Emerging from the SUS Thematic and Frequency Data Analysis.

In-vivo themes	**Sentiments** (frequency counts)	
	Satisfied	**Dissatisfied**
Connection (e.g., Interactions with staff and/or peers, sense of community, connectedness)	88	74
Content (e.g., Topics covered, material provided)	243	158
Context (e.g., Transition to online, reasons and justifications	52	25
Experience (e.g., Overall impression and level of satisfaction with the online learning experience)	42	69
L&T activities (e.g., learning and teaching activities and pedagogies, feedback, assessment tasks,	482	307

formal and informal education formats, including lectures, workshops)		
Look & feel (e.g., Aesthetic elements, visual design, layout, format)	12	10
Organisation (e.g., Arrangements, management, structure, navigation, chunking, connecting content and activities, timing, learning pathway)	81	195
Peers (e.g., Interaction with other students, behaviour, quality of exchanges)	53	34
Personal (e.g., Individual circumstances, behaviour, attitude and motivation, learning preferences, needs, personal impact)	17	48
Space (e.g., virtual, physical space)	32	53
Teaching staff (e.g., Interactions with lecturers and tutors, attitudes, behaviour)	284	160
Technology (e.g., hardware, software, internet access, mode of delivery)	60	87

Online learning site appraisal framework

Studies examining online learning site design and implementation — often subject units delivered via a Learning Management System (LMS) such as Canvas or Moodle — span educational research subfields, such as educational design, technology, and learning spaces. They aim to enhance the user experience, effectiveness, consistency, and usability, often blending research and evaluation methods, and employing metrics or predetermined indicators to measure the success or quality of online learning spaces (Ellis & Goodyear, 2016).

Building on this orientation, we developed an appraisal framework consisting of a typology of sites and a unit design checklist to evaluate pedagogical and design quality (Figure 2). The typology categorises online learning sites according to the course type, discipline, and dominant focus (i.e., content, teacher, student). The checklist offers an inductive approach in the form of set indicators to appraise online learning sites.

Figure 2

Steps in the Appraisal of Online Learning Sites

More specifically, the typology was refined by reviewing and coding sites according to the LMS pedagogical functions, activities, layout, and elements of design (e.g., headers, images, and icons), and the technologies used, including whether they were embedded or linked to an external site.

From this review, three broad types of online learning sites emerged: 1) content-centred; 2) teacher-centred; and 3) student-centred. Content-centred sites were characterised by a single-entry point design (e.g., horizontal and vertical navigational bars, hyperlinks etc.) and structured according to the type of material taught.

Teacher-centred sites adopt the teacher's perspective, favouring 'ideal' students familiar with conventional teaching approaches. They feature single- or multiple-entry points suited to one-way (e.g., from staff to students) or two-way communication, privileging peer-to-peer exchanges. For example, a site that provided access to lists of material with discussion boards to work through the content with peers, but not with teachers, was categorised as content-centred. A site that delivered content through recorded lectures, included regular announcements from the teacher about due dates and expectations, and a discussion forum for students to interact with their peers only was categorised as teacher-centred. Student-centred sites target diverse learners with varied abilities, needs, experiences, and backgrounds, offering multiple-entry points and two-way communication opportunities. For example, a site that had live tutorials, made use of Q&A during lectures, and provided summaries and learning activities for key readings was categorised as student-centred. It should be noted that this allocation of type was not linked to the appraisal of the quality of the site. Indeed, all three types have pedagogical value and are valid forms of online learning.

The typology also featured pedagogical annotations about aspects like the presence of synchronous activities, scaffolding, problem-solving approaches, or self-regulated learning. Some of these were chosen for their role in encouraging active learning through authentic problem-solving group projects, interactive discussion, and reflection assignments (Berge, 2002). Similarly, engagement with activities targeting planning, organising, self-instructing, self-monitoring, and self-evaluation, strengthens self-regulated learning (Adam et al. 2017).

We then reviewed the annotations against Johnson et al.'s (2019) Canvas-specific evaluation checklist for online site quality assessment, which we adapted to our university's context. Johnson et al.'s (2019) checklist focuses on four key pedagogical areas: course information, content, assessment, and accessibility. The checklist provides a list of indicators of foundational elements of design and pedagogy to help assess the quality of online learning sites (Essential, Best Practice, Exemplary), such as the level and type of instructions or the range of assessment methods.

To make Johnson et al.'s (2019) assumption of the direct relationship between the presence of certain elements of design and the quality of learning explicit, we replaced 'essential', 'best practice' and 'exemplary' with 'limited' (when they do not include all the basic elements), 'basic' (when they only meet the basic criteria), 'good' (when they meet all the basic and most of the good elements of design) and 'excellent' (when they meet the basic and a majority of the good and excellent criteria) to describe the quality of online units. We also added a column of domains that translates the description of specific elements of design into the student feedback analysis themes (Table 2).

Data about the online sites collected from the research team's review and categorisation according to the typology of content, student or teacher-centred design was then compared against our tailored checklist to determine the site's quality.

Table 2

Tailored Checklist used in the Appraisal of Online Learning Sites (adapted from Johnson et al., [2019])

Quality	Element of design	Description	Domain
Basic	Course information	Up to and accurate information, including dates	Content
	Home Page	Landing page with a brief course description or introduction and instructions for quick access to content	Look & Feel
	Navigation	Clear and consistent (unused items are hidden)	Organisation
	Key learning information	Goals, learning objectives and/or standards as well as course materials, supplemental textbooks, and reading lists Class expectations, including participation rules, etiquette expectations, code of conduct, policies	Organisation

		for grading, late work and make-up work, and technology requirements	
	Instructions	For processes and deliverables Clearly written to ensure understanding and to support student actions	Organisation
	Contact information	Contact details and may include biography, availability information, communication preferences, response time, and picture	Organisation
	Varied learning activities	A variety of learning activities is used (e.g., discussions, individual and/or group assignments and quizzes) to increase learner engagement and promote active learning Student-student interaction to foster a sense of community (e.g., discussions, constructive collaboration and peer reviews) Student-teacher interactions are promoted (e.g., teacher is actively engaged in authentic conversations and provides quality feedback) Student-content interaction that stimulates students' engagement with content and resources, and provide opportunities for self-assessment	Pedagogy
	Links	All links, files, videos and external URLs are active and working Hyperlink text incorporates the hyperlink destination/purpose (avoid raw URLs, e.g., https://www.canvaslms.com) and includes words and phrases to provide context for screen-readers (e.g., use 'Canvas Guide – Hyperlink' rather than 'Canvas Guide')	Technology
Good	Institutional resources	Contains information and links to resources, such as library, institutional services, school's website	Content
	Visual representation	Subject representation by adding an image in Course Settings Images are used to support course content (e.g., banners, headings and icons) and accompanied	Look & Feel

		by text descriptions (Alt text) or captions for more complex descriptions Colour is used to enhance the aesthetic appeal and effectiveness of the course Sufficient contrast between text and background makes information easy to read Colour is not used in isolation to convey meaning	
	Modular/ chunked information	Content is 'chunked' into manageable pieces (e.g., organised by units, chapters, topic, or weeks) using modules' function	Pedagogy
	Feedback	Opportunities for course feedback are present and available to students throughout the duration of course Uses formal and informal feedback to improve subsequent course revisions Teachers score and provide prompt and high-quality feedback to students	Pedagogy
	Outcomes	Learning outcomes are tied to assessments	Pedagogy
Excellent	Scaffolding	There is a 'Welcome' or 'Let's Get Acquainted' discussion designed to build a sense of community and establish rapport	Connection
	Varied assessment tasks	Modules begin with an Introduction/Overview page and end with a Conclusion/Summary page to 'bookend' each module	Content
	Sound	Audio materials (mp3, wav, etc.) are accompanied by a transcript and videos / screencasts are closed-captioned	Content
	Accommodation	A statement about accommodation for students with disability is present and easily located (e.g., on Home Page or Syllabus)	Content
	Style and structure	Text headers and indention are included within modules to help guide student navigation Styles (e.g., Paragraph, Heading 2, etc.) are used to format text	Look & Feel

		Tables are used appropriately and are accessible	
	Marking criteria	Rubrics used to evaluate assignments and/or discussions	Organisation
	Naming convention	Modules and items within modules have descriptive names (e.g., name the module 'Chapter 1: Pandas in the News', not just 'Chapter 1')	Organisation
	Safety	Content, collaboration and access Use of passwords (e.g., Google drive) and/or waiting rooms for zoom to avoid 'zoom-bombing' Protection of confidential information Use of moderation settings to avoid inappropriate comments. Clear communication protocols to avoid cyber-bullying	Organisation
	Scaffolding	Module completion requirements and/or prerequisites are used to provide course structure, pacing and flow Learning pathways are built into the modules Sample tasks are provided to illustrate expectations	Pedagogy
	Varied assessment tasks	Low stakes (formative) assessments occur frequently throughout the course to measure knowledge, skills and attitude and occur before high stakes assessments High stakes (summative) assessments are clearly aligned with stated goals, learning objectives and/or standards	Pedagogy
	Personalised learning	Opportunities for student choice	Pedagogy
	Document Preview	Enabled using plug-ins, such as Auto-open Inline Preview	Technology

	External tool relevance	External tools (e.g., Quizlet, Khan Academy, Padlet, Nearpod, CK-12) are relevant to course content and support active learning techniques	Technology

Comparative analysis

The final aspect of this framework was the comparative analysis of the findings from a deductive thematic analysis of students' feedback on their online learning experience, with those from the inductive evaluation of all subject units' online learning sites to elicit key elements of pedagogy and design as deemed satisfactory by students and appraised as 'good' or 'excellent' by educational designers and researchers. The comparison was conducted by the researchers who conducted the appraisal of online learning sites.

The comparison was made possible because of the commonality between the domains of the checklist and the themes that emerged from the analysis of students' feedback. This central point of reference was used to surface correlations and discrepancies, congruence, or divergence, between students' perceptions of subject units and the appraisal of its associated online learning sites. In the first instance, the comparative analysis of students' feedback data with the appraisal of the online site designs serves to determine obstacles and enablers to students' learning in and engagement with the fully online environment as well as what students considered satisfactory or unsatisfactory learning experiences. In the second instance, it highlights the core pedagogical values of various types of online learning sites and the most suitable elements of design for each type.

Table 3

Comparing Students' Perceptions of Focus and Levels of Satisfaction with their Online Subject Units with Reviewers' Appraisal of the focus and the Quality of the Associated Online Subjects' Learning Sites

Subject units	Student feedback analysis	Online sites appraisal	Comparison
Unit 1	Teacher-centred // Satisfied	Content-centred // Good	Different // Aligned
Unit 2	Content-centred// Dissatisfied	Content-centred // Basic	Same // Aligned
Unit 3	Content-centred // Satisfied	Content-centred// Basic	Same // Not aligned
Unit 4	Teacher-centred // Satisfied	Teacher-centred // Good	Same // Aligned
Unit 5	Content-centred // Satisfied	Student-centred // Good	Different // Aligned
Unit 6	Teacher-centred // Satisfied	Student-centred // Good	Different // Aligned
Unit 7	Teacher-centred // Satisfied	Student-centred // Basic	Different // Not aligned
Unit 8	Content-centred // Satisfied	Content-centred // Basic	Same // Not aligned

Unit 9	Teacher-centred // Satisfied	Teacher-centred // Good	Same // Aligned
Unit 10	Teacher-centred// Dissatisfied	Teacher-centred// Excellent	Same // Not aligned
Unit 11	Teacher and Content-centred // Satisfied	Teacher-centred// Good	Same // Aligned
Unit 12	Content-centred // Satisfied	Student-centred // Good	Different // Aligned
Unit 13	Teacher-centred // Satisfied	Teacher-centred// Good	Same // Aligned

Applying the framework

Context

The framework was applied during the early months of the COVID-19 health crisis. Although the threat or promise of a fully online university has been present for decades, it was not until 2020 and the COVID-19 pandemic that this became a quasi-reality. The rapid global shift to online/remote education that occurred in response to the pandemic provided a unique and rich context for understanding what had been speculated about during three decades of debates and research into online education, especially in terms of infrastructure, teaching skills and knowledge, and students and teachers' acceptance, particularly since neither had signed-up for this.

Against this backdrop, we embarked on a study to explore students' online learning experiences during the pandemic. This investigation held significance not only due to the novel context but also because, before 2020, all courses within the business school of this Australian metropolitan university were conducted exclusively in face-to-face settings. Our initial objective was to understand how teachers were adapting to the online environment and to gauge the students' levels of satisfaction with their learning *experience*—more so than on the actual learning *outcomes*. A particular emphasis was placed on highlighting the pivotal role of course design in fostering engagement and retention among online students (Martin et al., 2021). This led to our study on how students' experiences align with educators' and learning designers' definitions of 'good' online learning.

Our main datasets were the appraisal of 234 subject units' online learning sites. The feedback from 1,247 students enrolled in a sample of 13 subject units was collected through the university's standard SUS, and further feedback from 16 students was collected through 3 separate focus groups. Approval to collect data was granted from the university's human ethics committee (protocol number: 2019/862).

Thirteen subject units' online learning sites were selected as a representative sample of the total set of 234 sites offered by the business school. The 13 sites were selected to ensure we collected feedback from students enrolled in subject units that included the range of key

features identified through the research team's appraisal (e.g., course type, discipline, centredness, number of students enrolled in the unit, qualitative and quantitative subject units, undergraduate and postgraduate, in the first, middle and final year). The 1,247 students represented a subset of a total of 6,337 students, or 20% of all cohorts.

Results

In relation to students' experiences after the rapid move to online, although students appreciated the efforts deployed by the university, the business school and teachers to transition to fully online learning to limit the effects of the pandemic on their learning, given a choice, most students would prefer a return to campus and face-to-face learning and teaching activities (Huber et al. 2020).

Our analysis of the 234 online learning sites revealed that more than half (54%) of the sites were mostly content-centred, 30% were mostly student-centred, and a minority (16%) were teacher-centred. Also, we found that the great majority (68%) of sites were classified as 'Good' and close to a quarter (23%) belonged to the 'Basic' category, while only a few sites were categorised as 'Limited' (7%) and 'Excellent' (2%) (for more details see Huber et al. 2020).

The comparative analysis of students' learning experiences in the 13 sample online learning sites and the authors' appraisal of these online learning sites' design showed that, at times, students' experiences differed from our appraisal and therefore with educators and learning designers' evaluation and understanding of quality online learning design (Table 3). For example, an appraisal of a subject unit's online learning site as 'good' or 'excellent' did not necessarily translate into a satisfactory experience of that unit for students or a unit appraised as 'basic' was not always experienced as unsatisfactory. Also, students' perceptions of a unit's pedagogical focus or locus of control (i.e., the student, the teacher or the content) did not always match our appraisal based on elements of design. This difference between experience and appraisal was at times observed for both quality/satisfaction and focus of a unit.

We noted that what was considered a basic design was not experienced as an unsatisfactory experience. Similarly, content-centred sites, often seen as something to avoid in online learning, in favour of a more active application of knowledge (Wang et al., 2021), whether experienced by students and/or appraised as such using the design checklist, were not linked to an unsatisfactory experience. This could be the case when online learning subjects create a strong sense of community between students and teachers, either fostered through teacher presence, social presence and/or cognitive presence (Garrison et al., 1999; Rovai, 2000). This could, perhaps, also be the case because learning environments that require certain types of efforts are not always detrimental to positive learning outcomes and/or perceived as negative learning experiences (Chen et al., 2022). The design and scaffolding of the interactions with the content can contribute to this positive student experience.

In Huber et al. (2020), we argued that the difference between our appraisal focused on elements of design and students' appraisal based on their experience of interacting with people and material, highlights the effect of teacher presence, social presence, and cognitive presence on design (Garrison, et al., 1999) and the difference between planning and implementing. The findings discussed by Huber et al. (2020) also show that elements of design are perceived differently by individual learners (e.g., sites designed as student-centred but perceived as teacher-centred by students, and sites appraised as excellent but showing students' dissatisfaction with it), which confirms Hancock's (2004) argument that learners' judgement about aesthetic and their resulting experiences are subjective and not always positively correlated.

Further, the results suggest that a well-designed site had less value when teachers' presence, guidance and/or levels of interaction with students were low or when the content or learning activities were not perceived as matching students' learning goals. This broadly correlates with Anderson et al.'s (2005) findings that revealed that provided there is a high level of deep and meaningful interaction with either teachers, content, *or* peers, the learning experience remains satisfactory even if the other two types of interactions are minimal or even not present. Even though ranking and comments were not collected from all the students enrolled in the full range of online learning sites, these results confirm that meaningful educational experiences occur within a community of students and teachers through presence and interaction.

Comparing students' feedback with our appraisal of the online sites also highlighted the fact that the right pedagogical balance for positive online learning requires not only good, consistent design, but also teachers' leadership and presence, as well as timely responses to students' enquiries.

Limitations

We are mindful that the rapid changes within the university environment (during this study) were influenced by socio-cultural, financial, and technological factors (such as access, data plans, and bandwidth), impacting both staff and students. Although these factors likely influenced students' feedback, our study lacked related data. Skills, attitudes, and interaction preferences with people, content, and technology were also uncharted. Therefore, our findings only partially explain students' comments and appraisals.

Additional caution and refining are also required in the categorisation of sites. The framework only allowed for a partial appraisal of the range of pedagogical activities used by teachers because sites were not appraised 'in action'. This issue was mitigated by appraising the quality of sites according to the presence of some/most elements of a category, rather than based on the presence of all elements of a given type or quality.

Further, categorising at the blurred boundaries of types — designed as heuristics to simplify complex practices — occasionally turned subjective. Types were, therefore, assigned to describe whether a site was *mostly* content, teacher or student-centred. The categorisation of sites was done in a way that assigned a label to each site based on its predominant driver of both design and pedagogy.

Further research

One way in which this framework could be further refined is through the inclusion of teacher data, such as their feedback on the tools and learning design instructions and student-teacher interaction (Wilson et al., 2021). It is important to maintain a focus on teachers who are pivotal in this environment as the ones engaging students with these elements of design and pedagogy (Martin et al., 2020; Bolliger & Martin, 2021; Wilson et al., 2021).

Including teacher data would ultimately mean that teachers are better supported in transitioning to, growing in, and/or innovating with their online teaching. Indeed, for many staff, teaching online is a new experience brought about by the pandemic and even with a return to on-campus teaching, a move to more blended approaches is most likely and perhaps now more readily welcomed (Rapanta et al., 2021), provided they receive essential support to translate pedagogies into online learning and teaching.

Another area for future research is to look at student responses through a demographic lens, such as undergraduate vs. postgraduate, or the potential effect of being an international student as opposed to a domestic one (Purkayastha & Huber, 2023).

Conclusion

By focusing on both students' experiences of online learning and the quality of elements of functional and pedagogical design present in subject units' online learning sites, we designed and implemented a framework that compared an inductive thematic and sentiment analysis of students' perceptions of their subject units with a deductive evaluation of the subject's associated online learning sites. This analysis sought to contribute to the gap in research in exploring, beyond the conceptual, the relationship between what is pedagogically *considered* as 'good' elements of online learning design and what is *experienced* as 'good' learning.

Although the analysis identified some congruence between students' learning experiences and scholarly understandings of learning design, we also discovered a divergence in perceptions, as courses rated excellent from a design viewpoint did not always align with students' evaluations. Further, our analysis highlighted the need to further study how design elements are experienced, not in isolation but *in situ*. This involves examining how various elements interact with each other, identifying what aspects are critical, enhance or detract from a positive

learning experience, and determining which design elements may take precedence in specific contexts.

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Declaration of interest statement

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

References

Adam, N. L., Alzahri, F. B., Cik Soh, S., Abu Bakar, N., & Mohamad Kamal, N. A. (2017). Self-regulated learning and online learning: A systematic review. In *Advances in Visual Informatics: 5th International Visual Informatics Conference*, IVIC 2017, Bangi, Malaysia, November 28–30, 2017, Proceedings 5 (pp. 143-154). Springer International Publishing. https://link.springer.com/chapter/10.1007/978-3-319-70010-6_14

Anderson, H. M., Cain, J., & Bird, E. (2005). Online student course evaluations: Review of literature and a pilot study. *American Journal of Pharmaceutical Education, 69*(1), 34–43. https://doi.org/10.5688/aj690105

Berge, Z. L. (2002). Active, interactive, and reflective elearning. *The Quarterly Review of Distance Education, 3*(2), 181–190.

Bolliger, D. U., & Martin, F. (2021). Critical design elements in online courses. *Distance Education, 42*(3), 352–372. https://doi.org/10.1080/01587919.2021.1956301

Braun, V., & Clarke, V. (2012). Thematic analysis. In APA handbook of research methods in psychology, Vol 2: Research designs: Quantitative, qualitative, neuropsychological, and biological (pp. 57–71). American Psychological Association. https://psycnet.apa.org/doi/10.1037/13620-004

Castro, M. D. B., & Tumibay, G. M. (2021). A literature review: Efficacy of online learning courses for higher education institution using meta-analysis. *Education and Information Technologies, 26*(2), 1367–1385. https://doi.org/10.1007/s10639-019-10027-z

Chen, C. J., & Teh, C. S. (2022). Exploring students' online learning interaction behaviors and experiences: *A case study. Teaching and Learning Inquiry, 10.* https://journalhosting.ucalgary.ca/index.php/TLI/article/view/75572

Claeys-Kulik, A.-L., Jørgensen, T. E., & Stöber, H. (2019). Diversity, equity and inclusion in European higher education institutions. *Results from the INVITED Project.* Brussels: European University Association Asil, 51p. https://eua.eu/resources/publications/890:diversity,-equity-and-inclusion-in-european-higher-education-institutions-results-from-the-invited-project.html

Clifton, G. (2017). An evaluation of the impact of "learning design" on the distance learning and teaching experience. *The International Review of Research in Open and Distributed Learning, 18*(5). https://doi.org/10.19173/irrodl.v18i5.2960

Dart, S., & Cunningham, S. (2023). Using institutional data to drive quality, improvement, and innovation. In M. D. Sankey, H. Huijser, & R. Fitzgerald (Eds.), *Technology-Enhanced Learning and the Virtual University* (pp. 1–24). Springer Nature. https://doi.org/10.1007/978-981-19-9438-8_29-1

Ellis, R. A., & Goodyear, P. (2016). Models of learning space: Integrating research on space, place and learning in higher education. *Review of Education, 4*(2), 149–191. https://doi.org/10.1002/rev3.3056

Fredricks, J. A., & McColskey, W. (2012). The measurement of student engagement: a comparative analysis of various methods and student self-report instruments. In S. L. Christenson, A. L. Reschly, & C. Wylie (Eds.), *Handbook of Research on Student Engagement* (pp. 763–782). Springer US. https://doi.org/10.1007/978-1-4614-2018-7_37

Garrison, D. R., Anderson, T., & Archer, W. (1999). Critical inquiry in a text-based environment: Computer conferencing in higher education. *The Internet and Higher Education, 2*(2–3), 87–105. https://doi.org/10.1016/S1096-7516(00)00016-6

Goos, M., & Salomons, A. (2017). Measuring teaching quality in higher education: Assessing selection bias in course evaluations. *Research in Higher Education, 58*(4), 341–364. https://doi.org/10.1007/s11162-016-9429-8

Hancock, D. (2004). *Improving the environment in distance learning courses through the application of aesthetic principles*. USF Tampa Graduate Theses and Dissertations. https://digitalcommons.usf.edu/etd/1065

Heinrich, E. (2021). Exploring course evaluations based on self-determination theory. *Advancing Scholarship and Research in Higher Education,* https://doi.org/10.59197/asrhe.v2i1.5321

Hollister, B., Nair, P., Hill-Lindsay, S., & Chukoskie, L. (2022, May). Engagement in online learning: Student attitudes and behavior during COVID-19. In *Frontiers in Education*, (Vol. 7, p. 851019). Frontiers Media SA. https://www.frontiersin.org/articles/10.3389/feduc.2022.851019/full

Huber, E., McEwen, C., Bryant, P., Taylor, M., Arthars, N., & Boateng, H. (2020). Learning from a rapid transition to remote emergency teaching: Developing a typology of online business education designs. Paper presented at *ASCILITE 2020. Virtual Conference*. https://2020conference.ascilite.org/wp-content/uploads/2021/04/ASCILITE-2020-Proceedings-Huber-E-et-al.pdf

Ichimura, Y., & Suzuki, K. (2017). Dimensions of MOOCs for quality design: Analysis and synthesis of the literature. *International Journal for Educational Media and Technology, 11*(1). https://ijemt.org/index.php/journal/article/view/216

Johnson, D. (2019, December 21). *Course evaluation checklist v2.0*. Instructure Community. https://community.canvaslms.com/t5/Canvas-Instructional-Designer/Course-Evaluation-Checklist-v2-0/ba-p/280349

Kebritchi, M., Lipschuetz, A., & Santiague, L. (2017). Issues and challenges for teaching successful online courses in higher education: A literature review. *Journal of Educational Technology Systems, 46*(1), 4-29. https://doi.org/10.1177/0047239516661713

Martin, F., Ahlgrim-Delzell, L., & Budhrani, K. (2017). Systematic review of two decades (1995 to 2014) of research on synchronous online learning. *American Journal of Distance Education, 31*(1), 3–19. https://doi.org/10.1080/08923647.2017.1264807

Martin, F., Bolliger, D. U., & Flowers, C. (2021). Design matters: development and validation of the Online Course Design Elements (OCDE) instrument. *The International Review of Research in Open and Distributed Learning, 22*(2), 46–71. https://doi.org/10.19173/irrodl.v22i2.5187

Martin, F., Sun, T., & Westine, C. D. (2020). A systematic review of research on online teaching and learning from 2009 to 2018. *Computers & Education, 159*, 104009. https://doi.org/10.1016/j.compedu.2020.104009

Marvasti, A., & Freie, C. (2017). Research Interviews. In *The BERA/SAGE Handbook of Educational Research, 2017* (pp. 624–639). SAGE. https://www.torrossa.com/en/resources/an/5019483#page=665

Mayer, R. E. (2019). Thirty years of research on online learning. Applied Cognitive *Psychology, 33*(2), 152–159. https://doi.org/10.1002/acp.3482

Oliver, M. (2002). *Creativity and the curriculum design process: A case study*. Higher Education Academy. http://www.heacademy.ac.uk/resources

Palmer, S. R., & Holt, D. M. (2009). Examining student satisfaction with wholly online learning. *Journal of Computer Assisted Learning, 25*(2), 101–113. https://doi.org/10.1111/j.1365-2729.2008.00294.x

Purkayastha, A., & Huber, E. (2023). What factors contribute to higher grades in a first-year undergraduate management unit: An exploratory study at an Australian university. *Higher Education Research & Development, 0*(0), 1–18. https://doi.org/10.1080/07294360.2023.2258818

Rapanta, C., Botturi, L., Goodyear, P., Guàrdia, L., & Koole, M. (2021). Balancing technology, pedagogy and the new normal: Post-pandemic challenges for higher education. *Postdigital Science and Education, 3*(3), 715–742. https://doi.org/10.1007/s42438-021-00249-1

Rienties, B., & Toetenel, L. (2016). The impact of learning design on student behaviour, satisfaction and performance: A cross-institutional comparison across 151 modules. *Computers in Human Behavior, 60*, 333–341. https://doi.org/10.1016/j.chb.2016.02.074

Rovai, A. P. (2000). Building and sustaining community in asynchronous learning networks. *The Internet and Higher Education, 3*(4), 285–297. https://doi.org/10.1016/S1096-7516(01)00037-9

Stracke, C. M. (2017). The Quality of MOOCs: How to improve the design of open education and online courses for learners? In P. Zaphiris & A. Ioannou (Eds.), *Learning and Collaboration Technologies. Novel Learning Ecosystems* (pp. 285–293). Springer International Publishing. https://doi.org/10.1007/978-3-319-58509-3_23

Valverde-Berrocoso, J., Garrido-Arroyo, M. del C., Burgos-Videla, C., & Morales-Cevallos, M. B. (2020). Trends in educational research about e-learning: A systematic literature review (2009–2018). *Sustainability, 12*(12), Article 12. https://doi.org/10.3390/su12125153

Wallace, R. M. (2003). Online Learning in Higher Education: A review of research on interactions among teachers and students. *Education, Communication & Information, 3*(2), 241–280. https://doi.org/10.1080/14636310303143

Wang, X., Lee, Y., Lin, L., Mi, Y., & Yang, T. (2021). Analyzing instructional design quality and students' reviews of 18 courses out of the Class Central Top 20 MOOCs through systematic and sentiment analyses. *The Internet and Higher Education, 50*, 100810. https://doi.org/10.1016/j.iheduc.2021.100810

Wilson, S., Cram, A., Tyrrell, J., & Wardak, D. (2022). *Design patterns for connected learning at scale*. ASCILITE Publications, e22137–e22137. https://doi.org/10.14742/apubs.2022.137

Wilson, S., Huber, E., & Bryant, P. (2021). Using co-design processes to support strategic pedagogical change in business education. In *Handbook of teaching and learning at business schools* (pp. 20–35). Edward Elgar Publishing. https://www.elgaronline.com/display/edcoll/9781789907469/9781789907469.00010.xml