The good and bad of an online asynchronous general education course: Students' perceptions

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The pandemic resulted in many courses being shifted to online delivery, but some courses are designed as online courses from their conception. Courses intentionally designed for online delivery should be well-received by students, but it is not clear which aspects of courses students find particularly appealing and unappealing. We examined students' perceptions of one such online asynchronous course in psychology in order to better understand students' preferences in terms of specific course elements. Students were asked to identify what they particularly liked and disliked about the course in two open-ended questions. Responses were then coded to quantify the frequency of each aspect of the course. An inductive and latent approach to coding was used, with codes being used to develop themes based on the underlying meaning of the text. Overall, students identified few negative aspects about the course. They particularly enjoyed the specific psychology content, format, and structure of the course, that it related to their real lives, and the flexibility provided by the asynchronous nature. The hope is that this information can be used to improve this particular course as well as inform instructor decision-making related to the design of online asynchronous courses in general.
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Introduction

THE pandemic resulted in many courses being shifted to online delivery, which is likely to be very different from a course being designed for online delivery from its conception (Venable, 2021). When courses are designed to be delivered online from the onset, pedagogically sound courses are designed to include the principles of learning which work best for the online delivery, rather than, for example, adapting activities designed for in-class to the online environment (Hodges et al., 2020; Means et al., 2014). In this paper, we examine students' perceptions of an elective introduction to psychology course which was designed to be delivered asynchronously online. The course, designed and taught by the authors of this paper, was a general elective breadth course which students could choose to take to complement their primary program of study. General education courses are not related to students' program of study and, in addition to providing a more academically well-rounded student, have the secondary goal of developing transferrable skills such as communication and critical thinking.

There are a number of learning and memory principles that psychologists and other scientists have supported with empirical evidence (including universal design for learning, dual coding, peer-to-peer collaboration, retrieval practice, interleaving, and spacing effects) which can be employed to help our students succeed. First, we discuss these principles in turn, then we describe the design of our course and how these principles were used to support student learning.

Universal Design for Learning

Universal Design for Learning (UDL) is a framework to help eliminate barriers in the learning environment and make learning accessible to all students, without the need for them to disclose or receive special accommodations (CAST, 2018). It includes three principles: Multiple Means of Repre-

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sentation (variety in how we present content to students); Multiple Means of Action and Expression (variety in how students demonstrate their learning); and Multiple Means of Engagement (which speaks to the need for motivation and feeling safe to learn). This framework goes well beyond accessibility needs in that it requires educators to consider various aspects of the learner and learning environment in order to reduce (or ideally, eliminate) the barriers to learning (CAST, 2018; CAST, n.d.).

Multiple Means of Representation encourages the presentation of the same information in multiple ways, such as graphs, text, and video. This is in line with the Dual-Coding Theory (Clark & Paivio, 1991) which suggests that content is easier to understand (and subsequently remember) when verbal and non-verbal information is combined (Bui & McDaniel, 2015). The result is that students not only have an easier time understanding the materials, but they also have more retrieval cues, making their access to the information easier.

The Multiple Means of Action and Expression component of UDL empowers students to demonstrate their learning in multiple ways, including authentic assessments in the course, (see ACEL, 2016) and/or choices for which type of assessments students wish to complete or which question(s) they want to answer. Additionally, offering students a choice in assessments will tap into their unique strengths and academic preferences (which also aligns with the multiple means of engagement principle). Research, primarily in the US and Canada, documents the benefits of using UDL as it relates to student performance and students' enjoyment of learning (Baumann & Melle, 2019; Phuong et al., 2017).

Multiple Means of Engagement recognises that students must be motivated to learn and must also feel they are in a safe environment for that learning to occur. Meaningful, online student interactions of various types (with content, with other students, with the instructor), supports the social aspect of learning which has been shown to benefit student learning (Bernard et al., 2009; Hodges et al., 2020). Being motivated to learn could, for example, mean that students have control or ownership of their learning by way of the learning environment created by faculty (Christian et al., 2020). Additionally, providing students with choice engages them with the learning process and makes them a more active, rather than passive, participant, something which can also be achieved through gamifying elements of a course (Matsumoto, 2016).

There is much support for the benefits of aligning curriculum decisions to the UDL framework. For example, a recent report by The Higher Education Quality Council of Ontario, a government agency, has recommended that UDL be implemented in higher education in order to help students succeed; this recommendation came, in part, based on students' own survey responses related to their perceptions of their online learning in higher education during the pandemic, and which highlighted UDL practices as being important for their success (Napierala et al., 2022).

Learning principles

Because novice cognitive networks can be quite different from those of experts, it can be more difficult for experts (e.g. instructors) to find common ground in order to effectively explain certain concepts to novices (Bowman et al., 2013). As such, peers may be in a better position to bridge that gap and explain a concept with which their classmates are struggling. Additionally, explaining a concept to a peer can re-activate and strengthen the memory trace, resulting in a stronger connection, both for the explainer and the person receiving the explanation, thus increasing retention (Hoogerheide et al., 2016).

In addition, there are also many other principles of memory which make it easier to store and/or retrieve information from memory. For example, some types of information, like the autobiographical information contained

in episodic memories, are more easily remembered (Sekeres et al., 2022). There is also evidence to support the fact that retrieving information (e.g. writing down everything about an article we just read) will enable the learner to retain more information after a delay of several days or even weeks, than simply re-reading that information (Karpicke, 2016). In this way, the retrieval of information promotes retention over time (Sekeres et al. 2022) and the improvement of retention following retrieval practice has been shown to be a robust effect in a recent meta-analysis (Adescope et al., 2017). In addition, long-term learning is enhanced when the retrieval is spaced over time rather than massed together (Kang, 2016); interleaving other types of problems or topics (rather than a blocked approach) also appears to be beneficial to learning, especially in non-rote learning and broadening the learned information to make inferences (Rohrer et al., 2015).

It also appears that forgetting plays an important role in remembering because it helps us to select which pieces of information are useful; with the ultimate goal of seeking to understand the world around us to make decisions, memorizing is not adaptive (Nørby, 2015; Oppong, 2020; Richards & Frankland, 2017). This might partly explain why spacing effects and retrieval practice help our memories. That is, repeating the information after having pruned it makes use of the previous trace memory, showing our cognitive system that it is, indeed, required. This, consequently, allows us to make stronger connections, resulting in a more permanent storage of that information (Kornmeier et al., 2022; Oppong, 2020).

Student perceptions of online courses

Before examining how we designed the course in the present study, we first explored what has already been published related to students' perceptions of online courses, with the goal of using this information to help direct the pedagogical choices we made.

Although many students appreciate the benefits that come along with online learning such as greater flexibility (Elshami et al., 2021; Napierala et al., 2022), some students have a negative view of online courses (Hara & King, 1999). This may be explained in part because of frustrations related to technology or because successful online learning requires greater motivation and self-regulation on the part of the student compared to traditional in-person delivery (Dabbagh & Kitsantas, 2004; Greene & Azevedo, 2007; Hara & King, 1999). More specifically, students often have a negative perception of the following aspects of online education: difficulty in understanding the material online or that online delivery made the material less interesting, experiencing technical issues, a lack of connections and relationships, the delay in instructor feedback/response, difficulty staying focused/engaged, and a reduction in their own motivation to learn (Elfirdoussi et al., 2020; Napierala et al., 2022; Petrides, 2002; Song et al., 2004; Stark, 2019; Vonderwell, 2003; Woods, 2002). More recently due to the pandemic, most students enrolled in higher education have experienced some version of remote delivery in their coursework (Ali, 2020). Some students perceived this emergency online delivery of courses positively (e.g. Asgharzadehbonab et al., 2022), but it has not always been a positive experience for students (e.g. Conrad et al., 2022), especially with the 'Zoom fatigue' which many experienced during the pandemic (Bennett et al., 2021; Shockley et al., 2021; Wiederhold, 2020).

There are many factors which have been shown to affect student perceptions of courses and the formal evaluations of faculty. For example, many demographic characteristics (such as age, gender, ethnicity), perceived attractiveness or beauty, and the grades students earned in the course have all been shown to influence student perceptions as measured on formal evaluations of teaching (e.g. Al-Issa & Sulieman, 2007; Boring & Stark, 2016; Clayson et al., 2006; Hamermesh & Parker, 2005; Hendrix, 1998; Miller & Chamberlin, 2000; Smith & Hawkins,

2011). It may be possible to de-emphasise some of these variables in an asynchronous online environment (e.g. faculty demographic characteristics), and help augment others by better supporting students in their learning (e.g. performance/grades) in order to encourage a more accurate and positive perception of the course environment.

The impact of asynchronous versus synchronous delivery of online courses has not provided consistent evidence in terms of student outcomes. Some studies show that a live, synchronous delivery of content is better for students (e.g. Nguyen et al., 2021) while others have demonstrated that it is an asynchronous delivery which benefits students more (e.g. Cutherell & Lyon, 2007). Asynchronous delivery may align better with the principles of UDL (CAST, 2018) and better support students from the lens of equity, diversity, and inclusion (Fries-Britt & Turner, 2002; Hachey, 2017; Melkun, 2012; Sue, 2010; Walls & Hall, 2018).

Course design

In response to some of these student criticisms of online learning, we wanted to provide students with a good online course. When we designed this general education elective psychology course for two- and three-year college students, we intentionally framed our decisions using the principles of UDL (CAST, 2018). For example, students are empowered to take control of their learning by having the freedom to choose how they wish to demonstrate their learning for each unit (either a multiple-choice test or group project). This particular choice also employed the benefits of peer-to-peer interactions if they choose the group assignment. Otherwise, students still interacted with their peers through weekly discussion posts reflecting on the experiments they experienced, and often applying the content to help a classmate (e.g. optimise their memory performance by providing suggestions on how to sleep better).

We also present the weekly content in numerous ways, including original research articles, self-written text, images and graphs, as well as videos, which supports multiple means of representation (CAST, 2018) as well as dual coding (Clark & Paivio, 1991). Past research has shown the particular importance of the motivational aspects of learning for student success (e.g. Chiu & Hew, 2018; Dabbagh & Kitsantas, 2004; Means et al., 2014), so this was an area of focus for us in our course design. We included elements of gamification, such as badges for completing the weekly work, and automated emails praising them for their successes (e.g. earning 80% or greater on a major assessment).

Student ownership of learning was further supported with the asynchronous nature of the course, allowing students the flexibility to complete the weekly work on their own schedule, without the need to log in at any particular time, which has been shown to support student success (Asgharzadehbonab et al., 2022; Cutherell & Lyon, 2007; Hachey, 2017; Murphy et al., 2011). As a consequence, students were also able to collaborate with each other at whatever times that worked for their respective schedules or asynchronously using some of the Microsoft and Google suite of tools which support this approach; how they approached this work was up to each individual group and allowed for students to balance their schedules, preferences, and other responsibilities. To allow for additional flexibility, students could miss one of the small activities per unit without penalty as the lowest scored item was dropped.

In order to tap into the greater ease of retention and/or retrieval of episodic memory (Sekeres et al., 2022), students participated in weekly experiments and reflected on questions which linked the psychological principles from the course to their lived experiences.

In line with the recommendations of Roediger and Karpicke (2006) and Adescope et al. (2017), we included regular low- or no-stakes quizzes in the course, where students could continue to attempt

to earn a perfect score until mastery (if they so choose). A few questions are spaced throughout the content (e.g. at the end of one topic/section) and a slightly longer quiz at the end of every week. In this way, it was easy to interleave information from other weeks in the unit to 'force' students to retrieve those pieces of information in a more spaced out way.

Thoughtful consideration was given during the design and planning stages of course development. But we wondered whether students actually noticed or appreciated these elements. In line with Hutchings' (2000) taxonomy of inquiry questions in the scholarship of teaching and learning, we were interested in describing the perceptions of our learners about the course. As such, the purpose of this paper was to describe the self-reported experiences of students in this newly designed online course, which was designed in such a way that it focused on diverse student needs using the UDL framework as well as built in many principles of learning. Although a secondary goal was to use this information to make ongoing improvements to this new course, the timing of the data collection may also allow us to comment on what the 'post-pandemic' student perceives as positive and negative aspects of online courses, now that most have had additional experiences with online learning.

Method

Participants

In total, 180 Canadian college students provided responses. They were all enrolled in the authors' five sections of an introductory psychology general education course. A general education course is an elective course in a subject which is not related to students' primary area of study and which helps them to become more well-rounded in their knowledge as well as to develop transferrable skills such as critical thinking, communication, interpersonal, creativity, etc. No demographic information was available because this project used student responses as secondary data. Students enrolled in general education courses are most likely to be in a 2-year or 3-year diploma program at the college, though some 1-year certificate students could also be enrolled. The student body at the college comprised mostly domestic students (16% international), with more than half of students (53.5%) aged between 21–35 years old and 40.3% under 21 years old, so we can expect our sample to roughly match this overall student population. Because these data come from students' regular coursework, we are not concerned with a response bias (or nonresponse bias) such that some sub-populations within our target might be more or less likely to respond to a survey (Couper, 2000; Sax et al., 2003). This activity was completed as part of their regular course activities.

Materials and procedure

The course examined was a fully asynchronous, online, introduction to psychology general education course. It included elements of universal design for learning (CAST, 2018) and was designed to incorporate various principles of learning such as retrieval practice, spaced rehearsal, and dual coding as described earlier. As part of the instructors' reflective practice and to encourage student growth and metacognition, one course activity required students to reflect on their own performance as well as what they like and dislike about the course. The reflection activity occurred mid-semester and followed a stop-start-continue format where students identified something they feel they should stop doing because it is impeding their success in the course (e.g. stop procrastinating on course work); something they could start doing to help them succeed (e.g. make flashcards to study the material); and finally, acknowledge something they are going to continue doing because it is working for them (e.g. ensuring they complete all of the assigned material every week). Specifically, for the purposes of this study, students were also asked to answer

two additional open-ended questions as part of that activity: 'Compared to other online courses you have taken at this institution, is there anything that you like more about this course?' and 'Compared to other online courses you have taken at this institution, is there anything that you like less about this course?'. We took each students' responses to these questions and anonymised them (if required) before analysing them. The institution's Research Ethics Board approved this study prior to commencement.

Results

Two analyses were conducted, a qualitative analysis to describe the reported perceptions of students, followed by a quantitative analysis to test whether the number of positive responses was greater than the number of negative responses compared to what would be expected by chance (using Chi Square).

Qualitative analysis

We followed a conventional content analysis approach to coding in order to describe the data we collected (Hseih & Shannon, 2005). The three authors each coded approximately one third of the responses using a common list of codes that were derived as follows: One researcher began coding her data using an inductive approach, allowing the themes to be identified based on the latent meaning of students' responses. Then, this list was provided to the remaining authors to code their own student's data, while allowing for additional new codes to be added if they were not present in the first researcher's sample. All researchers had the ability to add new codes if none of the ones in the list captured any part of the response. To calculate inter-reliability, in accordance with Riffe et al. (1998), roughly 10% of the items were coded by two people. In those items, coders matched 86% of the time. We calculated Cohen's (1960) Kappa for each pair of raters. Even our lowest value (k = .62) still showed adequate inter-rater reliability agreement to proceed with our analyses (Cohen, 1960; Landis & Koch, 1977; McHugh, 2012).

Table 1: Summary of student responses for what they liked best in the course. The values represent the percentage of students who included that course element in their response.

Element	% of students
Psychology topics	15.16
Layout and structure of the course	13.03
Related to real life or career	6.91
Flexibility	6.91
Videos	5.85
Choice of unit test or unit project	5.85
Engagement	4.52
Asynchronous delivery	3.99
Organised	3.99
Quizzes	3.72
Easy to understand	3.72
Weekly activities	2.66
Best course	2.39
Learning and retention	2.39
Group projects	2.13
Not stressful	2.13
Other (fewer than 2% each)	14.62

Positive Aspects: There were many elements of the course that the student enjoyed (see Table 1). Specifically, students enjoyed the psychological content of the course and the way it was structured. They also appreciated the videos provided (some instructor-generated and others curated from elsewhere such as Ted Talks) and the flexibility which the asynchronous nature of the delivery provided. Another element that many students identified as being better than their other courses was to be given the choice of how they would like to demonstrate their learning at the end of each unit, which clearly aligns with one of the principles of UDL (Multiple Means of Engagement).

In student's comments, all three principles of UDL, as well as various principles of learning were evident. For example, one student highlighted how much they valued the choice of assessment in the course (Multiple Means of Action and Expression) because it reduced their level of stress: '…I like how we have the choice on what method [of evaluation] we are comfortable with and can take our learning and evaluations with less stress about tests only.' (Student #35). Students also commented on our use of Multiple Means of Representation 'This is exactly how any course, online or not, should be taught. Paced out, and with repetition, multiple examples, visual representation and multiple ways to enforce learning.'(Student #6) and 'I like how this course has a little bit of everything (discussion posts, quizzes, assignments etc).' (Student #4).

For Multiple Means of Engagement, students wrote 'I love your interaction with the class, like replying to our discussion posts and those emails I get on Sudnays [*sic*] congratulating me on finishing the week's content.' (Student #81) and 'I really enjoy

this class; I feel it is exciting each week' (Student #132). One student even stated that they noticed the built-in accommodations in the course 'I like the number of accommodations it provides, for all the students' (Student #173).

Several students also articulated that, in particular, the spaced retrieval practice built into the course design helps them to remember the information better. "The 'test your knowledge' blurb at the end of chapters of the week. These have been very helpful in seeing whether I understood what I have just read or missed something to go and read again." (Student #62) and 'i [*sic*] am greatly enjoying this class and retain more info then others:)' (Student #2) and 'This course makes it easy for me to understand the weekly material and reinforce my newly learned knowledge to help me retain information.' (Student #14) and 'I like how the content we learn contains small quizzes to help solidify our knowledge and just make me feel more confident in what I just read' (Student #142).

Negative Aspects: Overall, almost half of all students responded that there was nothing about this course which was worse than their other courses. This does not mean that the course was not perceived negatively, but that it was not any worse – this point will be examined in the Discussion section. The top element identified as negative by the remaining students (i.e. those who did not say there was 'nothing' negative) was that the course was delivered asynchronously, though it was only a small number of students (7.21%) who identified this as a negative aspect of the course (see Table 2). Other problematic elements included

Table 2: Summary of responses for what students did not like in the course. The values represent the percentage of students who included that course element in their response.

Element	% of students
Nothing/NA	46.63
Asynchronous delivery	7.21
Layout and structure of the course	5.77
Easy to forget course tasks	5.28
Amount of work	4.81
Group projects	2.88
Retention	2.88
Discussions	2.40
Online delivery	2.40
Weekly due dates	2.40
Other (fewer than 2% each)	17.36

Table 3: Direct comparison of the percentage of students who reported liking vs disliking the same course elements.

Element	Positive (%)	Negative (%)
Asynchronous delivery	3.99	7.21
Layout and structure of the course	13.03	5.77
Group projects	2.13	2.88

that 1) it was easy to forget about the course; 2) completing the weekly tasks; and 3) the structure of the course. A small number of students also identified that the course was too much work. Table 3 directly compares the elements which were perceived positively by some students and negatively by others.

Quantitative analysis

In total, students articulated 376 positive things (i.e., in the question asking them to identify what they liked about the course) about the course and 208 negative things (i.e., in the question asking them to identify what they disliked about the course). Using a Chi-Square test (with Yates correction), we examined whether this difference was significant, and indeed, these observations were not equal as would be expected by chance: students identified significantly more positive attributes related to the course than negative ones ($\chi^2(1, 584) = 47.76$, $p < .01$). In other words, significantly fewer negative aspects of the course were present in the data than positive ones.

Discussion

We asked students to provide us with feedback about our general elective psychology course. Specifically, we asked them to consider what was better about this course and what was worse. Results showed that nearly half of our sample identified no negative aspects about the course. We framed students' perceptions of this course in the context of their other online learning experiences because we wanted to encourage students to self-reflect more deeply, thinking about the other courses they have experienced and how this one compares. Of course, students who have experienced primarily bad online courses might be setting the bar very low for a 'good' course. However, at least at our college, we have many excellent resources and supports to assist faculty in adapting or developing content for online delivery, so we suspect this framing did not significantly affect students' perceptions of the course. Nonetheless, future research could examine this question using a more objective and open-ended approach.

Many of the elements which students brought up in their responses as elements that they particularly enjoyed about our course (such as course structure/organization, interesting content, student interaction, and instructor presence) align with previous research findings which showed the importance of these same elements for predicting students' satisfaction with the course and their perceived learning (Gray & DiLoreto, 2016; Jones et al., 2021). This user-friendly approach to learning is important because it limits barriers for learners and leads to more satisfied learners who have a more positive perception of the course (CAST, 2918; Eom et al., 2006).

In addition to the specific psychology content included in the course (as well as its applicability to their lives or careers), students particularly liked the asynchronous nature of the delivery, pointing to the fact that they enjoyed the format and structure of the course, as well as the flexibility it provided. This positive view of asynchronous courses is consistent with much of the literature, which suggests that well-developed online asynchronous courses are preferred by students compared to synchronous ones (Cutherell & Lyon, 2007). This preference

for asynchronous delivery of online courses may be particularly true for students post-pandemic (Elshami et al., 2021; Napierala et al., 2022). Another positive element which students highlighted was the ability to choose the nature of their unit assessments. This also aligns with the principles of universal design for learning (UDL) which propose that choice and flexibility are motivating and that they help students to engage with their learning (CAST, 2018). This format may have also resulted in students working within their strengths and may promote greater metacognitive reflection as they consider which assessment to select for each unit. In fact, providing students with this kind of opportunity to reflect about their own learning is recommended to help students develop their metacognitive skills (Malone, 2020; Rahman et al., 2010).

As Landrum et al. (2021) point out, student satisfaction in a course is strongly related to how closely the course meets their expectations, which can vary from student to student. In setting up this course, we provided students with clear goals at the beginning of the content every week, and interspersed reminders throughout the weekly content in terms of expectations and tasks to complete. It seems that this may have helped narrow any gap between student expectations and what the course was delivering. As a consequence, this could have increased students' positive perceptions of the course.

Of the issues raised by students in their feedback, one was particularly surprising to us: that the course was easy to forget. This was surprising because we planned the course to include multiple reminders every week for students. To that end, we built in at least three occasions per week where students received communications from their instructor: welcome to the week, success tip of the week, and other varied communications (good job on an assignment or activity, reminder of assessments, individualised feedback on weekly activities, notification they earned a badge, etc). One possible issue with the set-up was that our academic institution set the default notification setting for students' learning management system (LMS) account to be that they not receive any notifications. That is, students must opt in (rather than opt out) to receive emails when announcements are posted in the LMS, for example. Although we provide instruction to students during the first week of the course on how to set up their notifications and recommend that they turn on most of them, we have proposed that it would be beneficial to student success if the default setting were to be that students receive notifications.

A small number of students also perceived that the course was too much work. Our explanation for this perception is that students likely compared the 'out of class' workload in this course to their other courses which included 3-hour lectures and only a small amount of additional work. Unlike those courses, this fully asynchronous course has no 3-hour lecture, so there is much more outside work (the equivalent of 3 hours). Students self-registered for this course and selected their course section knowing the delivery mode for which they were registering. As such, for those students who felt it was too much online work, or who disliked the asynchronous nature of the course, we would not be able to make these changes once they were enrolled.

Other psychological variables have been shown to affect student perceptions. For example, the norm of reciprocity might encourage students who are 'given' higher grades in a course to also 'give' more a favourable evaluation of their teacher's teaching (Clayson et al., 2006). Giving students more ownership in their learning, including flexibility about how they are assessed and demonstrate their learning, and when they choose to complete the coursework during their week, may have helped students to perceive the course positively (CAST, 2018; Christian et al., 2020). Future studies should examine whether students' enjoyment of the course translates into more tangible

outcomes such as higher grades, better long-term retention, and/or a higher success rate.

Limitations

There are several limitations to the present study. The first is a result of our design, which was based on previously-collected secondary data from the stop-start-continue course activity. As such, we were not able to collect demographic information from students and there could be some important differences between the elements identified by certain groups which needs to be acknowledged and documented in future research. Additionally, because students provided data as part of their course work, their comments were not anonymous and social desirability, reciprocity, or other factors could have affected their reported perceptions of the course (Al-Issa & Sulieman, 2007; Clayson et al., 2006; Hessler et al., 2018; Krumpal, 2013). Anecdotally, students rated the course very highly (well above the college average) on the anonymous, formal evaluations of teaching they complete, so we are confident in the accuracy of the data we obtained on the stop-start-continue. Finally, this was a descriptive study and we cannot necessarily infer a cause-and-effect relationship between our course design and students' positive perceptions of the course. Future research could more explicitly manipulate the course design elements and student experiences to be able to more directly compare their effects. Despite these limitations, this study provides a good starting point, describing the elements which students particularly enjoyed in an online asynchronous general education psychology course.

Conclusions

This investigation has demonstrated that putting pedagogy first when designing a course as well as incorporating empirical findings from the cognitive sciences (spacing, retrieval practice, etc.) is worth the effort. For us, the result seems to point to a course where students report enjoying the content about which they are learning, as well as an overall very positive perception of this general education course. The analysis provided here can be used to inform instructors who are developing or updating their own courses, especially if they are online, asynchronous general education courses such as this one.

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