

Students' motivation in online learning: a trend analysis

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Abstract

This study aims to explore the trend in undergraduate tax students' motivation to engage with learning activities in an online environment over a three-year period based on the ARCS model (Attention, Relevance, Confidence, Satisfaction) of motivation. The data was collected over a period of three years, 2020 – 2022, from undergraduate tax students. Principal component analysis was employed to extract the components that most likely measure each of the dimensions of the ARCS model and the mean values in each of the datasets are used to illustrate the trend in motivation and determine the dimension of motivation that appears to be the weakest. A thematic analysis was used to identify categories or factors of attention as a motivational domain from student responses. The results showed that attention was a problematic domain, with little improvement over the three years and the importance of stimulating curiosity and participation is highlighted.

Keywords: remote teaching; ARCS model of motivation; online learning; tax education; student motivation

1. Introduction

A call for lecturers to incorporate the best of online into residential settings appears to be the future of teaching and learning (Harvard Task Force, 2022). Online learning was adapted by universities after the migration to emergency remote education in 2020 because of the pandemic (Unesco, 2021). This was the start of a new future for education, more so for those who never experienced online learning.

A large number of scholarly research has been published since 2020. Studies by García-Morales, Garrido-Moreno and Martín-Rojas (2021); Hermanto and Srimulyani (2021); and Dhawan (2020), focus on the challenges of online learning by higher education institutions and students. One of the challenges identified was keeping students motivated and engaged in the online learning process. For students to be highly motivated, they must have a sustained

level of attention. Motivation and attention are vital for successful academic learning, students who struggle with learning are often not able to sustain attention (Hutchings, 2010).

Keller's (2009) ARCS model of motivation can be used to measure student motivation and to identify which dimension of motivation appears to be lacking in students. The present study will determine in terms of the ARCS model's dimensions, the motivational gaps and identify the dimensions that are consistently low scoring over the three years.

2. Recent literature on motivation in online learning

Chiu, Lin and Lonka (2021) reviewed 9 empirical studies on student motivation in online learning during the covid pandemic. They identified that students who relate to online self-regulated learning, showed an increase in perceived learning gain and satisfaction, while online collaborative learning has been identified to have more impact on students learning from home alone than self-regulated learning. They further highlighted that factors such as social interaction, personal interest, and practical utility of tasks were identified as strongly related to student motivation.

Studies by Yan, Xiaohui and Yufei (2023); Kim, Knotts, Albers and James (2022); Gumasing, Dela Cruz, Piñon Nicolaison, Rebong and Sahagun (2023); and Vo and Ho (2024) all contribute different approaches to exploring student motivation and focus on different aspects, ranging from investigating relationship between lecturer and student to the effect of ergonomic factors on motivation. According to Maran, Tanggur and Bulu (2024) educators play a crucial role in sustaining and boosting student motivation, particularly in online learning environments. Ozdil, McDonald-Kerr, Tharapos, Khosa and Burch (2025) further open discussions about concerns in online learning which can negatively impact motivation, such as absence of networking and difficulty in deep engagement with complex module content. They stress the importance of addressing both the academic and psychological needs in education. A study done by Karyadi and Paristiwati (2024) identified that students who study in an online environment can get distracted easily due to their surrounding environment.

3. John Keller's ARCS motivational design theory

To be motivated means to be moved to do something (Ryan & Deci, 2000). People have different levels of motivation, but even more so, people have different reasons for being motivated. Keller's (2009) ARCS model of motivation informed the approach to the study. ARCS refers to Attention, Relevance, Confidence and Satisfaction.

Learners' **attention** should first be stimulated, then sustained, and then be directed to the concepts or skills to be learned for learning to take place (Keller, 2009). **Relevance** as

motivational dimension is based on the argument that people are more likely to pursue a desired outcome if such outcomes are aligned to their personal goals, motives and values (Keller, 2009).

“People’s behaviour is strongly influenced by their **confidence** in their ability to perform” (Ajzen, 1991: 184). Keller (2008) proposes that when students believe they can master a learning task, motivation to learn appears to be greater. **Satisfaction** can be described as the positive feelings learners may experience while engaging in learning activities (Keller & Suzuki, 2004). These positive feelings can be intrinsic or extrinsic satisfaction which in turn sustain desirable learning outcomes (Keller, 2016).

4. Objective

This study aims to explore the trend in undergraduate tax students’ motivation to engage with learning activities and material in an online environment over a three year period starting from the first year of Covid-19 lockdown restrictions. Two specific objectives are addressed namely, 1) to determine the trend and motivational gaps in the sample of students in terms of the ARCS model’s dimensions of motivation; and 2) to identify and explore the dimension that is consistently low scoring over the three years.

5. Methodology

Over a three-year period, a survey instrument based on Keller’s Course Interest Survey (CIS) was administered yearly to undergraduate tax students. The goal with the CIS instrument is to measure how motivated students are with respect to a particular course and not their general level of motivation towards learning (Keller, 2009).

The populations in each year were third-year students at a South African University registered in 2020, 2021 and 2022, thus resulting in three sets of data. The number of students registered every year respectively was 457 in 2020; 480 in 2021 and 412 in 2022. Response rates per year are 17.9%; 26.5% and 12.6%.

Principal component analysis was employed to identify the groupings of statements belonging to satisfaction, confidence, attention and relevance as dimensions of motivation and only the items per motivational dimension that had a factor loading higher than 0.5 were retained. In addition, a scale reliability test, the Cronbach Alpha, was also performed on each of the dimensions with the final grouping of statements as decided.

In this paper, mean values of the grouped statements in each of the datasets are used in the analysis. A thematic analysis was also employed, used to identify categories or factors of attention as motivational domain from student responses.

6. Results and discussion

A detailed view of the trend in students' motivation to engage with the online learning environment was done by comparing the mean scores in each of the dimensions of motivation over the three years. For 2022, we did not do a full survey and therefore do not have comparable scores for satisfaction and relevance. Figure 1 below shows the movement in the dimensions of motivation over the three years.

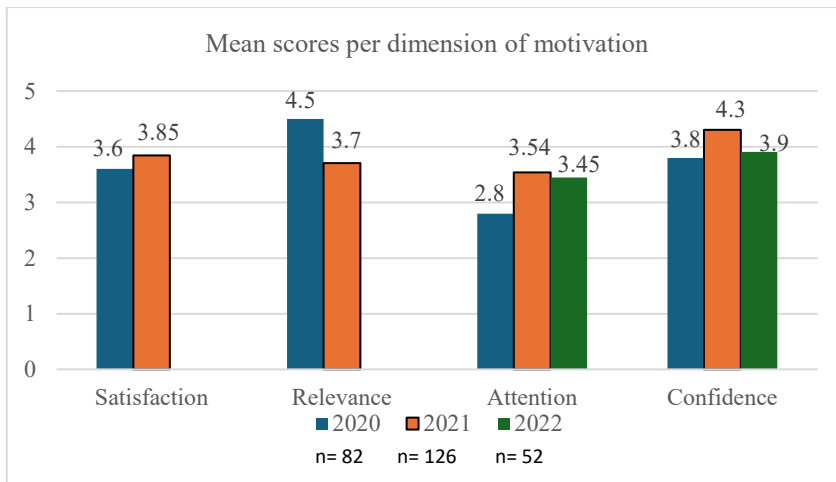


Figure 1. Trend in students' motivation per dimensions of motivation Source: Authors own display.

We expected that students would have felt more prepared to engage with online learning activities in the second year after the first year of emergency remote teaching and learning. Therefore, we anticipated students' confidence to have improved. Similarly, satisfaction with the experience of learning online, is also expected to show an upward trend, as lecturers should be more comfortable and prepared to present a lecture online compared to first year of crisis management in the sudden move to emergency remote teaching.

6.1. The gap in students' motivation

It is clear from Figure 1 that attention appears to be the dimension that is lacking most in all three of the populations surveyed. Although an improvement was seen in 2021, it dropped again slightly in 2022. The improvement signifies a more positive feeling of motivation and may indicate that students have found the online learning activities more interesting and stimulating in the second year of online learning. The importance of stimulating interest as a key factor in enhancing online learning was confirmed by both teachers and students in a study by Su, Xu, Zhang, Xin-yu, and Hao (2024).

Three statements measuring attention in our survey are:

- The lecturers knew how to make us feel enthusiastic about taxation
- I often felt bored during the online tax classes
- My curiosity was often stimulated by the questions asked or the assignments given for tax

The three elements of attention addressed in these questions, namely: enthusiasm; boredom; and curiosity are displayed in Figure 2 and the movement in the sentiment around enthusiasm, boredom and curiosity over the three years is illustrated.

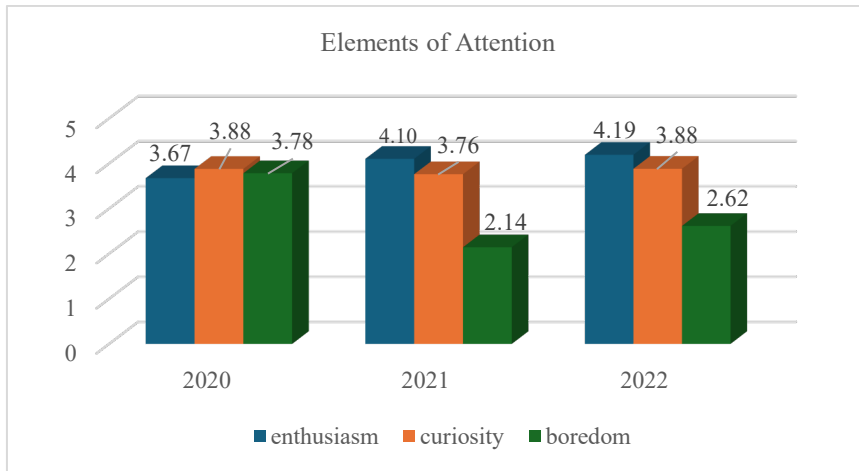


Figure 2. Trends in elements of attention. Source: Authors' own display.

From Figure 2 it can be seen that enthusiasm improved slightly each year, and curiosity remained relatively constant. Both elements indicate a positive sentiment, however the little movement in curiosity may be a concern. The sentiment around being bored, however, changed much from 2020 to 2022. A lower mean is a positive result, since the question were stated as “I often felt bored...”. Therefore, in 2021, students appear to be more active and engaged in the online lectures and had less feelings of boredom.

We further analysed some open-ended responses to a question posed to students in 2022 asking them to provide a reason on why they enjoy a certain learning environment. We specifically looked for reasons which pertains to how learning in a certain environment impacted their attention. Before coding, we first consulted a number of other studies which addressed attention as dimension of motivation in student learning to consider other theoretical codes. These studies are presented below and additional codes or categories for attention are highlighted.

Studies by Xu, Zhang and Wang (2024) and Yan, Xiaohui and Yufei's (2023) confirm the vital role of attention in motivating students to participate in learning. Yan, et al. (2023) identified five attention sub-categories, namely “incongruity and conflict, concreteness, humor, inquiry

and participation” as elements of attention. Of these, humor of instructors and inquiry seemed less critical. Incongruity and conflict in this context refer to the conflict between real-world experience and theoretical classroom learning, while concreteness is explained as having well defined objectives in the programme.

Kim, et al. (2022, p.9) found that “a close relationship between an instructor and students is particularly important for enhancing students’ learning motivation and sustained attention in the online learning context”. A third study explored the influence of ergonomic factors on academic attention in distance learning (Gumasing, et al., 2023) and founds that cognitive and macro-ergonomic factors significantly affects students’ academic attention. Cognitive factors are described as the process of designing and organizing the learning environment and includes to effectively communicate proper instructions, goals and expectations, similar to “concreteness” mentioned in the study of Kim, et al. (2022). Macro-ergonomics refers to organisational infrastructure such as the learning management system (LMS) and ease of access to technology and the internet.

Given the elements highlighted in the three studies above, we coded responses obtained from students in the third round of the survey on a question probing reasons for why they prefer a certain learning environment. We carefully considered each response to identify if the response pertained to ‘attention’ and if we could allocate codes that reflect any of the following elements: enthusiasm, boredom, curiosity, participation, humour, concreteness, incongruity, relationship, LMS, and easy internet access.

A total of 69 responses were analysed and assigned codes. Of these, 36 responses could be coded in the context of attention. The main categories found are ‘participation’ and ‘curiosity’, a few instances of ‘boredom’ and single responses coded with ‘relationship’ and ‘enthusiasm’. A new code was also developed, named ‘focus’ and assigned to a few responses that indicated that the online environment afforded them an opportunity to engage with a lecture with no disturbances.

7. Conclusion

Our paper demonstrated that **attention** is a problematic element of student motivation and that it showed little improvement in student sentiment over the three year period in the populations of students surveyed. Further, with a thematic analysis, we identified participation, curiosity, focus, relationship and boredom as elements that could shape student attention. From the literature, a further few elements were identified, namely incongruity, concreteness and humour.

The relevance of the study lies in understanding the gaps in student motivation and to purposefully develop strategies to address those areas of motivation. It is important to stimulate curiosity, for example to use real life examples and interesting facts and then to maintain that

interest with encouraging participation in class, allowing time for activities to counter boredom, build good relationship with students and provide clear learning goals.

We acknowledge that low-class attendance typically could result in lower student perception scores and therefore may affect the results of this study. Future research in student motivation could also consider class attendance as a variable to investigate.

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