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Motivation measurement of science student towards grouping e-learning

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ABSTRACT

During the two-year COVID-19 pandemic, lecturers must train themselves with information technology, assessment, and teaching expertise in order to move from face-to-face learning to virtual online learning. As a result, the current study aims to investigate the effect of student motivation on grouping e-learning in the ethics and civilization course. A total of 88 students from agriculture, fishing, and forestry were chosen to participate in the experiment. Students participated in online synchronous lectures for seven weeks and another seven weeks in online group presentations. After 14 weeks, students were given the attention, relevance, confidence, and satisfaction (ARCS) motivation model questionnaire to assess their motivation on the course. As a result, the ARCS questionnaire score was 4.62, indicating that student learning motivation was adequate. Furthermore, forestry students outperformed agricultural and fishery students in terms of ARCS model score. Male students who participated in the online grouping presentation had the greatest ARCS model score compared to female students. As a result, using an online group presentation learning system for asynchronous learning is possible and beneficial, particularly for male learners.

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1. INTRODUCTION

The COVID-19 pandemic that has hit the whole world impacts the learning and teaching process where online learning is essential for every educational institution. The transition from face-to-face to virtual online learning requires lecturers to equip themselves with information technology, assessment and teaching knowledge. The evolution of learning from traditional to online methods has been discussed for more than ten years face-to-face learning is also known as conventional learning, which involves learning directed with an adult learning theory and has instructional design guides [1]. Blended learning arose popular during the emergence of communication technology and integration with the teaching or learning process [2]. The impeccable merging of teaching and communication technology, known as online learning, was boosted during the COVID-19 pandemic. According to Gherheș *et al.* [3], face-to-face and blended learning which impose internet applications can be categorised under online learning.

Online learning is popular among students due to the significant progress in the accessibility of electronic and mobile devices. Online learning can be managed in a non-classroom circumstance, and students generally participate in course discussions and tutorials [4]. Therefore, students from different states and countries can learn without concern about COVID-19 infections and complicated standard operating procedures for interstate movement. Furthermore, online learning enables students to access vast information related to the courses while away from their educational institution [5]. Students and lecturers can conduct online classes efficiently, synchronous or asynchronous, at various times and places. In this regard, online learning is especially beneficial for students who require a different study method due to job, family, or social obligations [6], [7].

The online learning process can be divided into two main components: synchronous and asynchronous. Online synchronous learning requires students and lecturers to participate in the online class in real time. Meanwhile, online asynchronous learning is more flexible, students can access learning material and assignments prepared by the lecturer at any time. Online synchronous learning is the favoured method used currently, and based on the previous study, students show a positive learning experience for online synchronous learning. However, too many stimuli, student desire for non-verbal communication and technological problems are drawbacks in creating a positive learning experience [8]. Several studies on online asynchronous learning indicated that this method could improve the learning experience and positively impact the academic outcome [9], [10]. According to Yamagata [11], online synchronous learning is essential to complement asynchronous learning. Furthermore, it can create a stronger connection among students, with the instructor and stay engaged with course activities. This study is well supported by Rehman and Fatima [12], which involve a combination of this method through the flipped classroom.

Online synchronous and asynchronous learning encompass benefits and weaknesses based on many educational research conducted. The factor determining the positive experience of online learning depends on the approach applied in the class. According to Zhou *et al*. [13], online learning should be designed with a relevant and authentic experience for learners. The precise approach motivates the student during the lesson, producing a positive learning outcome. The student is encouraged during online learning with an interactive approach such as instruction from the lecturer [14]. Furthermore, Goh *et al.* [15] supported this finding, emphasising the significance of self-regulate and collaborative learning to create positive learning outcomes and satisfaction. Therefore, the present study aims to investigate the motivation aspect of the student toward the online group presentation (asynchronous) learning experience in the ethic and civilization course.

2. LITERATURE REVIEW

Motivation plays a pivotal role in learning and attaining academic accomplishments, functioning as the catalyst that ignites the aspiration to gain knowledge and abilities. The above-mentioned factor holds significant importance in ascertaining the degree of a student's involvement, drive, and achievement inside the educational framework [16]. A comprehensive comprehension of the intricate nature of motivation within the realm of learning is of utmost importance for educators, students, and policymakers alike. This understanding facilitates the actualization of individuals' complete capabilities within educational environments.

Two fundamental categories of motivation exist for the learning process, namely intrinsic and extrinsic motivation [17]. Intrinsic motivation is characterised by an individual's inherent drives and interests, which prompt them to participate in activities for personal enjoyment or fulfilment. On the other hand, extrinsic motivation is derived from external stimuli or outcomes, such as academic grades or verbal commendation [17]. In order to cultivate long-lasting and significant learning experiences, achieving a harmonious equilibrium between these two motivational approaches is imperative. Furthermore, the motivational tendencies of individuals are subject to considerable influence from a range of diverse features, including personality traits, aspirations, and self-confidence views [18]. The characteristics exhibit variability across learners, influencing their motivation for accomplishment, capacity to exercise self-regulation, and self-assurance in their abilities [19]. Recognising and adapting to these unique variations is essential in customising motivational strategies to cater to the various requirements of learners.

The arrangement of educational settings and teaching methodologies substantially impacts the degree of motivation students demonstrate. Research has demonstrated that implementing instructional strategies that integrate practical real-world applications and prioritise the meaningful utilisation of knowledge can significantly boost learners' motivation [20]. Moreover, with the provision of possibilities for learners to exercise autonomy, engage in decision-making processes, and engage in self-directed learning, it is plausible to augment their sense of empowerment and fortify their motivation [21]. Motivation in learning is subject to several influences, extending beyond academic factors to encompass social interactions, peer associations, and the interplay between educators and learners [22]. Establishing a favourable and inclusive environment marked by respect can cultivate a feeling of belonging and intrinsic motivation [17].

Furthermore, the cultivation of enduring motivation can be attained through establishing positive teacher-student relationships characterised by trust and encouragement.

Electronic learning, also referred to as E-learning or Online learning, is a significant contributor to the ongoing evolution of the education sector. It embodies a transformative impact, reconfiguring how knowledge is disseminated and acquired. Online learning utilises the powers of technology to facilitate learning experiences that surpass geographical constraints, augmenting the flexibility, personalization, and inclusiveness of education for persons from various age cohorts and socio-cultural contexts [23]. With the widespread growth of the internet and continuous advancements in digital tools and platforms, Online learning has become an integral component of contemporary education systems worldwide.

The incorporation of technology, characterised by the implementation of learning management systems (LMS), mobile learning, virtual reality (VR), and augmented reality (AR), has introduced a novel phase of online education, broadening its scope and possibilities [24]. These technological advancements provide educational experiences that are both immersive and engaging, accommodating a wide range of learning styles and individual preferences. In online education, a wide range of pedagogical approaches are utilised, including synchronous and asynchronous learning, flipped classrooms, gamification, and adaptive learning [25]. These methods are carefully crafted to cater to learners from diverse backgrounds, foster active engagement, and promote self-directed learning.

Online learning provides numerous benefits. Firstly, it offers flexibility and accessibility, allowing learners to conveniently access instructional information at any time and from any location where an internet connection is available [26]. This accommodates a wide range of schedules and caters to the particular learning paces of diverse learners. Furthermore, it facilitates cost-effectiveness by eliminating the necessity for tangible resources and travel expenditures, diminishing the overall financial burden associated with education [27]. Furthermore, online learning platforms can utilise adaptive learning technologies to customise information according to individual learners' unique requirements and preferences, hence augmenting their level of engagement and improving the overall results of the learning process [28]. Furthermore, Online learning facilitates increased engagement and interactivity by incorporating multimedia components, simulations, quizzes, and interactive exercises [29]. This approach encourages active involvement and promotes a more profound understanding of the subject matter. Moreover, it enhances global accessibility and fosters cultural inclusivity, enabling individuals from many regions to avail themselves of identical educational materials, thus encouraging intercultural interchange and international cooperation [30]. Finally, it is worth noting that Online learning frequently enhances time efficiency by allowing learners to advance through the material at their preferred speed, resulting in expedited course and programme completion, particularly for persons who are self-driven and inclined towards rapid advancement [31].

Although Online learning offers several benefits, it also presents significant problems. To begin with, the absence of face-to-face interaction in online learning can lead to a sense of isolation for individuals who excel in establishing personal connections and receiving quick feedback [32]. Additionally, the presence of technological obstacles, such as disparities in access to necessary equipment and dependable internet connections, gives rise to a digital divide that impedes the accessibility of Online learning, particularly for marginalised or socioeconomically disadvantaged communities [33]. Moreover, implementing Online learning necessitates significant self-discipline and motivation, as it lacks the organised setting of traditional classroom instruction and face-to-face responsibility [34]. As a result, specific individuals may experience challenges in sustaining concentration and progress. Finally, it should be noted that particular disciplines, particularly those heavily relying on physical application or practical experimentation, may present difficulties in delivering good instruction solely through Online learning methods [35]. Disciplines such as laboratory sciences or performing arts may require additional in-person experiences to facilitate a whole learning process.

3. METHOD

The study population was 88 individuals from three background groups of Fisheries, Forestry and Agriculture students in the Faculty of Agricultural Science and Forestry, Universiti Putra Malaysia Bintulu Sarawak Campus. The disputed subject was ethics and civilization, and all the participants were aware of the research process three days before the beginning of the study. All students experienced online face-to-face lectures for three hours from week one (1) until week seven (7). At the beginning of week eight (8) until week 14, students need to complete group assignments that require them to make group presentations based on selected topics at the end of week 14. At the end of week 14, the questionnaire was distributed to the students. All collected data on the questionnaires were analysed for attention, relevance, confidence, and satisfaction (ARCS) model scores.

4. RESULTS AND DISCUSSION

The present study investigated the effect of student motivation on grouping e-learning in the ethics and civilization course. While earlier studies have explored the impact of asynchronous and synchronous learning on student motivation in English class, they have not explicitly addressed its influence on the gender and background of the student [10]. The detailed statistical findings of the four questions of the ARCS questionnaire are depicted in Figure 1. The current study's total questionnaire average is 4.62 points. The findings demonstrate that learners' learning motivation is good, and all of the ARCS keys are more than 4.58 for the approach, indicating that the group presentation method and content design may be significantly improved. The dependability of a questionnaire is its credibility and stability, which means that each question is consistent. Cronbach's alpha is used in this study to validate the questionnaire's reliability criteria. Cronbach's alpha value was classified as quite high for the alpha range of 0.76 - 0.95, indicating that the questionnaire is useful [35]. There are 21 questions in all, with 88 effective samples. Cronbach's alpha ratings for four questions on this study questionnaire range between 0.79 and 0.87, and the whole questionnaire is α=0.0.95, indicating that the questionnaire is reliable.

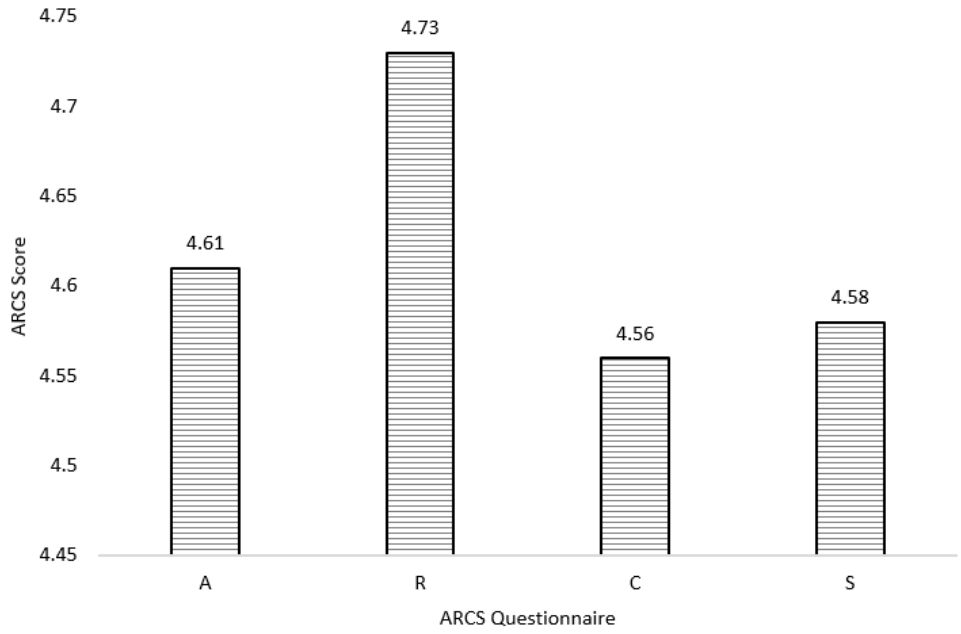

Figure 1. Average score of ARCS questionnaire

The ARCS questionnaire indicated that attention, relevance, confidence, and satisfaction-revised (ARCS-R) had the highest score (4.73) compared to other ARCS which ranged from 4.61 to 4.56. This indicates the online group presentation needs the learner's goal to create a positive attitude in class. Relevance is a powerful factor in determining a person's motivation to learn [36]. Through the online group presentation on ethics and civilization, the student understood how important this course is in their daily life. Ma and Lee [37] reported no significant difference in relevance between pure online, face-to-face and blended learning. However, the level of relevance perception in the traditional face-to-face group was higher than in the pure online group [38]. Depending on the online teaching approach, an unsuitable approach will make online learning very difficult, making learners uncomfortable with it. According to Ma and Lee [37], this may be attributed to the problem of students' self-regulation and the lack of independent study skills when they watch online course videos by themselves. According to Gustiani and Sriwijaya [38], students' motivation for online learning is influenced more by their desire to learn new things and their delight in trying out various learning methods. It was also impacted extrinsically by external control and environmental conditions.

The current study on online group presentation motivation from various student backgrounds revealed that forestry students scored higher in all motivational ARCS surveys than other students, with scores of 4.8 (A, R, and S), and 4.7. (C). Fishery students indicated the lowest ARCS score compared with Forestry and Agriculture students with a range of 4.5 to 4.6. Meanwhile, Agriculture students' ARCS scores ranged from 4.6 to 4.8 as shown in Figure 2.

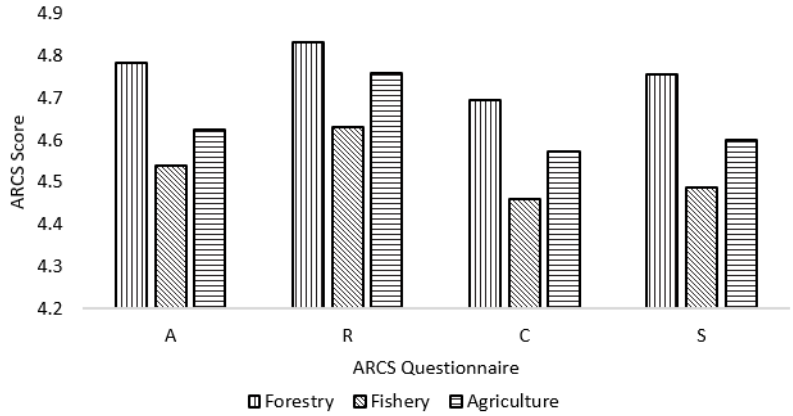

Figure 2. ARCS score between three types of student background

According to Meşe and Sevilen. [39], there are two elements that influence learner motivation: internal and external influences. Self-regulation was found to be one of the most important internal elements influencing students' motivation. The online learning environment definitely needed participants to establish new studying habits, which they found difficult [39]. Therefore, high ARCS score by forestry students suggested the group consist of high self-regulation towards ethics and civilization course compared to fishery and agriculture students. Furthermore, prior research has repeatedly demonstrated that self-efficacy is a key predictor of effective outcomes, student motivation, and satisfaction in online learning [40], [41]. The number of learners and situational interests were categorised as an external factor that affects learner motivation during online learning [39]. Students become apprehensive and lose the desire to attend lessons when they have few peers in a virtual class. This is similar to the forestry student, who has more participation in the ethics and civilization course than the fishery and agriculture students. Moreover, situational interest, such as a strong internet connection and appropriate studying surroundings, contributed to students' positive learning motivation. According to [42], students who feel interested in the course significantly perform better than those who feel uninterested in the course.

Current study on ARCS motivation scores across genders, male students led all ARCS scores with a range of 4.6 to 4.8. Meanwhile, female ARCS scores vary from 4.5 to 4.7 as shown in Figure 3.

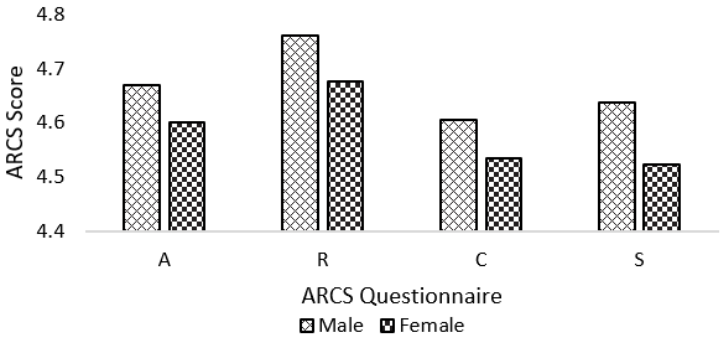

Figure 3. ARCS score between different gender

In comparison to male students, female students prefer a learning style that includes two-way reciprocal dialogue between or among learners who exchange information [40]. However, due to situational issues, reciprocal communication is less effective when used in online learning, particularly group discussion. Therefore, the online group presentation has less effect on male motivation during the course. The previous study on the student barrier in online learning indicated that gender is one of the independent aspects affecting the barrier factor rating [43]. Male students have higher extrinsic motivation than their female peers during the online course [44]. After the online group presentation, the students were evaluated based on their

performance during the presentation, and the high percentage mark for the assignment may drive male students to do better than their female counterparts. However, research showed that gender had no significant effect on self-efficacy, success, or desire toward online learning [45], [46].

This study explored a comprehensive impact on student motivation on grouping e-learning in the ethics and civilization course with further discussion on its impact on the student gender and background. However, further, and in-depth studies may be needed to confirm its motivation impact not only single course but multiple courses, especially regarding differences between gender and background. Furthermore, with additional multiple courses added in the future investigation, the sample size will be extensive, in this will have a significant impact in terms of statistical analysis application.

5. CONCLUSION

The ARCS model score suggested a favourable result in this study, which incorporated an online group presenting learning experiences in the ethics and civilization course. The research technique applies online group presentation learning to many demographic factors of science students, and the influence of varied student backgrounds on learning achievement and motivation is discussed. Some conclusions from the results might be communicated to the relevant educators: i) this study found that students' learning motivation in online group presentations is high (4.62), ii) forestry students have better ARCS scores than agriculture and fishery students in the demographic experimental group. The average motivation is 4.8>3, highlighting the effect of an online group presentation with high learning motivation, and iii) male students have higher ARCS scores than female students in the gender experimental group. This finding indicates that online group presentations clearly boost male students' learning motivation. Using an online group presentation learning system for asynchronous learning is viable and helpful. We hope to include more measuring variables to boost students' learning incentives in the future.

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