Exploring the Influence of Social Cognitive Theory on Online Group Work

Herda Balqis Ismail, Asmawati Che Hasan, Siti Shahidah Binti Sharipudin, Nurul Ain Umaiban Binti Yusof, Noor Raifana Binti Ab Rahim, Nor Mayuze Mohamad

Centre of Civil Engineering Studies, College of Engineering, University Teknologi MARA Johor Branch, Pasir Gudang Branch, 81750 Masai, Johor, Malaysia
Email: herdabalqis@uitm.edu.my, asmawati.ch@uitm.edu.my, shahidahs@uitm.edu.my, ainumaiban@uitm.edu.my, raifana_rahim@uitm.edu.my norma7544@uitm.edu.my
Corresponding Author Email: asmawati.ch@uitm.edu.my

Abstract
The transition to online learning has significantly altered the educational landscape, making it essential to understand the environmental factors that influence online group work. This study focuses on how digital platforms, communication tools, and physical settings impact the teaching and learning process among university students, specifically civil engineering undergraduates at Universiti Teknologi MARA (UiTM) Pasir Gudang Campus. The objective is to explore the students' perceptions of how their environment affects their behaviour, interactions, and overall effectiveness in collaborative tasks. This quantitative survey research employs an instrument consisting of four sections based on Bandura's social cognitive theory and Aderibigbe's elements of presence, encompassing demographic information, behaviour (cognitive presence), people (social presence), and environment (teaching presence). The findings reveal that teaching presence, with clear instructions and effective use of materials, significantly enhances the online learning environment. Correlation analysis shows moderate to low positive relationships between behaviour, people, and environment, indicating that these factors collectively influence the effectiveness of online group work. The study's implications highlight the importance of designing supportive digital and physical environments to facilitate successful online group work. It underscores the need for targeted strategies to optimise these environments, thereby improving student engagement and academic performance in remote learning settings.
Keywords: Online Learning, Teaching Presence, Cognitive Presence, Social Presence, Group Work.

Introduction

Background of Study

Exploring the environment's influence on online group work involves studying how the digital and physical contexts impact collaborative projects conducted remotely among civil engineering students at Universiti Teknologi MARA, Pasir Gudang Campus. This research area encompasses various aspects of the online environment, including virtual platforms, communication tools, and the design of digital workspaces, to understand their influence on group dynamics and outcomes. Scholars in this field examine how the usability and functionality of online collaboration tools affect student engagement, interaction, and productivity during group work activities (Julie & Melanie, 2016). Besides, online group work might also relate to the psychological and social effects of digital environments on student teamwork, examining elements such as digital presence, anonymity, and multimedia use in influencing communication and involvement in online groups. Beyond digital spaces, the influence of physical environments on remote group work among university students is also important. Garcia & Lee (2023) simplified that factor like study spaces, noise levels, and ergonomic setups impact concentration, collaboration, and the student's overall academic performance.

In Malaysia, this topic is highly relevant for university students for several key reasons. The increasing adoption of online education platforms in Malaysian universities, especially accelerated by the COVID-19 pandemic, highlights the importance of optimising digital workspaces for effective group collaboration among students (Lim & Wong, 2023). Besides, the inconstancy in technological infrastructure across different regions of Malaysia emphasises the need to explore how internet connectivity and access variations impact the quality and equity of online group work experiences among university students (Chin, 2023).

In summary, "Exploring the Influence of Environment for Online Group Work" in the context of university students focuses on understanding how digital and physical settings shape collaborative efforts conducted remotely. In Malaysia, this research area is crucial for enhancing the effectiveness and inclusivity of online group work experiences among diverse student populations, requiring tailored strategies to optimise digital environments and support meaningful student engagement and academic achievement (Garcia & Lee, 2023).

Statement of Problem

In today's digital age, online group work has become integral to higher education, enabling students to collaborate remotely on projects, assignments, and research endeavours. However, the effectiveness of online group work is not solely determined by the tasks assigned or the skills of individual group members; the environment in which collaboration takes place plays a crucial role.

The virtual environment in which online group work occurs significantly shapes the collaborative experience of university students. Research by Makruf and Tejaningsih (2023) highlights the importance of user-friendly platforms and intuitive interfaces in promoting effective communication and task coordination among group members. The most frequently used strategy to deal with the challenge of online teaching is choosing the most familiar, user-friendly, and affordable digital platform or application.

Another key challenge of online group work is the absence of physical presence, which can hinder social interaction and cohesion among group members. Studies by Kahlow et al (2020), emphasise the difference in conflict between online and face-to-face work groups. The findings indicate that in hybrid groups, face-to-face meetings might be utilised to swiftly establish group norms, trust, and cohesion, which could later improve online group interactions.

Based on recent studies, many studies have been done on online learning of university students. However, there is a lack of studies that focus on the basic element of online learning, which is the influence of the readiness environment on students. Bono et al. (2024) recommend that students' readiness for online learning is important as it can reduce the negative impact of online learning anxiety. Sulistiyani et al. (2024) also mentioned that further research could analyse the influence of the readiness of the adoption element in realising the success of lecturer and student interactions in online learning. This statement supports this research on environmental influence as one of the readiness components for students.

Objective of the Study and Research Questions
This study explores learners' perceptions of their use of learning strategies. Specifically, this study is done to answer the following questions;
- How do learners perceive their behaviour in online group work?
- How do learners perceive people in online group work?
- How do learners perceive the environment in online group work?
- Is there a relationship between behaviour, people and environment in online group work?

Literature Review
Problems and Advantages of Online Group Work
Online group work in education has been a focal point of scholarly discussion, particularly in its rapid adoption and the subsequent need to enhance its effectiveness. The advantages of online group work are manifold, including the ability to foster collaboration across geographical boundaries, the development of digital literacy, and the facilitation of diverse perspectives in the learning process (Donelan & Kear, 2023). Moreover, it aligns with the digital nature of modern workspaces, preparing students for future professional environments (Tonheim et al., 2024). However, these benefits are counterbalanced by challenges such as low student participation, difficulties in communication, and the need for clear guidance and support (Costley, 2021). To address these issues, educators are encouraged to design group projects that promote fair assessment and provide practical and emotional support to students (Chang & Kang, 2016). Despite these obstacles, online group work can enhance learning outcomes when strategically implemented by promoting critical thinking, problem-solving, and digital literacy skills (Koh & Hill, 2009). Moreover, using digital tools such as Google Drive has been suggested to streamline collaboration and give students a sense of ownership and autonomy (Kelly et al., 2022). By implementing these strategies, educators can enhance the educational outcomes of online group work, making it a more effective and rewarding experience for students. Balancing these inherent problems with the potential benefits is crucial for optimising the educational impact of online group work.

Past Studies on Online Group Work

Many Studies have been done to investigate the learning of online group work. A study by Cavinato et al (2021), discusses the implementation of collaborative and active learning strategies in analytical and general chemistry courses, particularly in online learning, to promote student engagement, interaction, and success. The study provides insights into using various technological tools and teaching methods to create interactive virtual class environments conducive to learning and fostering connections between classmates. Additionally, the study highlights the importance of understanding the nature of remote learning barriers and the support students need to successfully design and implement effective virtual courses. Meanwhile, Sari & Oktaviani (2021), investigated the effectiveness of online learning platforms for Indonesian undergraduate students during the COVID-19 pandemic.

The study by Cavinato et al (2021), investigates the challenges and strategies for promoting student interaction, engagement, and success in an online learning environment, particularly in the context of analytical and general chemistry courses. the findings of the significance of active learning, technological tools, and course modifications to create an effective and equitable virtual learning environment, particularly in the context of the challenges posed by the shift to remote learning during the pandemic.

Next, Sari and Oktaviani (2021), investigated the online group work adopted in the teaching and learning process. The respondents in this study are a hundred and eighty-five undergraduate students from the English Literature Department who have participated in online learning through the learning management system Moodle, known as *Sistem Pembelajaran Dalam Jaringan* (SPADA). These students were chosen because they have had online learning experiences using these platforms since the first year. A questionnaire survey and interview method were adopted for this study. The finding revealed that most students found the platforms beneficial, enabling them to access learning materials easily, communicate with classmates and lecturers, manage study time, and work independently or in groups.

Conceptual Framework

Theories of learning have indicated how the environment can influence the way we gain knowledge. Bandura (1986), in his social cognitive theory, emphasises that learning involves the learner interacting with the people around them and their environment. According to Rahmat et al (2021), learners in online learning need to have autonomy and attention in order online learning learners need autonomy and attention to gain satisfaction in learning. Figure 1 shows the conceptual framework of the study. This framework is scaffolded from Bandura's (1986), cognitive theory to merge with Aderibigbe's (2021), three types of presence, as shown in Figure 1 below.
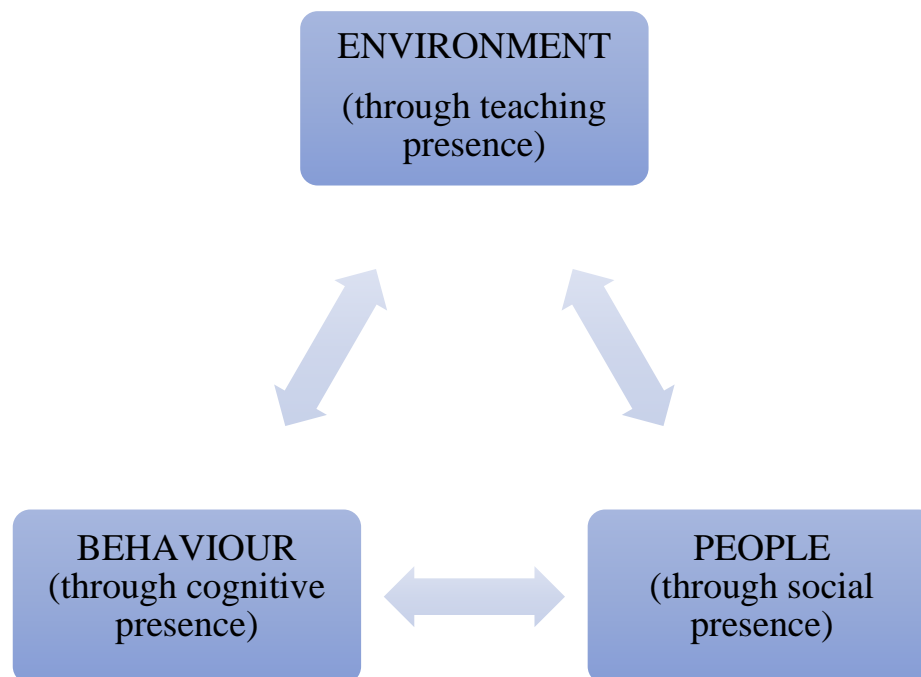
ENVIRONMENT

(through teaching presence)

BEHAVIOUR
(through cognitive presence)

PEOPLE
(through social presence)

Figure 1- Conceptual Framework of the Study
The Influence of Environment on Online Group Work

Methodology

This quantitative study is conducted to explore online group work among civil engineering undergraduates at Universiti Teknologi MARA (UiTM) Pasir Gudang Campus. A purposive sample of 130 participants responded to the survey. The instrument used is a 5 Likert-scale survey from Bandura (1986), and Aderibigbe (2021), to reveal the variables in Table 1 below. The online survey forms were sent to civil engineering undergraduates within one month, from Feb 2024 to March 2024. The survey consists of 4 sections. Section A has items on the demographic profile. Section B has 7 items on behaviour (cognitive presence). Sections C and D have 8 items on people (social presence) and environment (teaching presence).

Table 1
Distribution of Items in the Survey

Section	Social Cognitive Theory (Bandura,1986)	Elements (Aderibigbe, 2021)	No. Of Items
B	Behaviour	Cognitive Presence	7
C	People	Social Presence	8
D	Environment	Teaching Presence	8
Total Items			23

Table 2
Reliability of Survey

Cronbach's Alpha	N of items
0.864	23

Table 2 displays the survey's reliability. The analysis shows a Cronbach alpha of .864, revealing the instrument chosen's good reliability. Further analysis utilising the Statistical Package for the Social Sciences (SPSS) has been conducted to present the findings addressing this study's research questions.

Findings
Findings for Demographic Profile

Table 3
Percentage for Gender

No.	Gender	Percentage
1	Male	56%
2	Female	44%

The demographic information collected from the respondents to the questionnaire used in this study is shown in Table 3 above. This research aimed to identify the elements contributing to group projects' effectiveness in a virtual setting. Of the total participants in this survey, 56% are male students, 44% are female students, and the participants were between 19 and 21 years old. This gender distribution indicates that the study's sample was typical of the student population in terms of gender. 130 students participated in the survey conducted for a month. Out of the 130 participants in this survey, 73 were male students, while the remaining 57 were female students. The students involved in this survey are from public universities. The participants for the survey are diploma students from the engineering and business fields. The survey included semi-structured questions to elicit information regarding students' perceptions of the learning environment, motivation, and challenges encountered during online group work.

Table 4-
Percentage for Year of Study

No.	Year of Study	Percentage
1	Year 1	21%
2	Year 2	45%
3	Year 3	34%

The survey was conducted to analyse the influence of the environment on online groups, revealing varying levels of engagement across different years. In the first year, 21% of students participated in the survey, while in the second year, the participation increased to 45%, and in the third year, it accounted for 34% of the respondents. In the first year of the study, 21% of respondents believed the environment significantly influenced online group work, suggesting a lack of awareness or a preference for other factors. The low percentage could suggest that during the first year of the study, students might not have fully recognised the impact of the environment on their online group work experience. The number increased to 45% in the second year, indicating the awareness of the importance of the environment in facilitating effective online group work. Our findings also suggest that the level of flexibility in the online group work environment can influence the ability of team members to collaborate effectively. The reduction to 34% in the third year indicates a partial reversal of the previous year's peak. There could be some explanations for this reduction. Creating a

conducive and flexible environment for online group work is important for students to become more proficient in using these tools and platforms.

Table 5
Percentage for Strength of Wi-Fi

No.	Strength of Wi-Fi	Percentage
1	Strong	25%
2	Average	69%
3	Weak	6%

The survey on the environment's influence on online group work gathered data on the strength of Wi-Fi connections. The results indicated that 25% of students reported having strong Wi-Fi connections, 69% reported having average strength, and only 6% reported having weak Wi-Fi connections. The data suggest that most students had an average Wi-Fi connection, potentially impacting their online group work experiences. Students with a strong Wi-Fi connection are more likely to experience less disruption through online group work. They can easily access material for academic work, interact in real-time, and participate in video conferences without experiencing substantial lag. This group may report higher levels of satisfaction and productivity than others. Most students choose average internet connections, indicating that their internet connection is moderately reliable. They may experience occasional disruptions, which does not limit their capacity to participate in online group work. Students with a weak Wi-Fi connection face significant challenges during online group work. They are more likely to have frequent disconnections, making accessing online academic materials difficult. As a result, their productivity and experience with online work groups may be worse than those with stronger connections.

Table 6
Percentage for Online Learning Experience

No.	Experience	Percentage
1	Less than one year	24%
2	1 year and above	76%

The survey exploring the environment's influence on online group work revealed that 76% of students had over a year of online learning experience. In comparison, 24% had less than a year's experience. Most students had over a year of experience, which means the survey findings would mainly represent the viewpoints of people with significant experience with online education. However, it is worth noting that students with less than a year of experience in online group work because of the early adaptation phase and the unique problem that newcomers to online education confront. The survey findings could be used to make recommendations for improving online group work. These recommendations include strategies for enhancing technological support, encouraging virtual collaboration, promoting social bonds among online learners, and mitigating challenges to different stages of online learning experiences.

Findings for Behaviour

This section presents data by answering research question 1- How do learners perceive their behaviour in online group work? In the context of this study, this behaviour is measured by cognitive presence.

Table 7

Mean for Cognitive Presence

Items	Mean
CPQ1 At the beginning of the group work, I am lost at how to begin the discussion	2.8
CPQ2 When I work in groups online, I am confused over the different types of ideas discussed	2.7
CPQ3 When in online groups, I am amazed at how many ideas the group can come up with	3.4
CPQ4 Group work allows group exchange of information	4
CPQ5 My team members present new information in the group discussion	3.7
CPQ6 Group work allows team members to connect their ideas	4.1
CPQ7 At the end of the online group discussion, my team used the new ideas we discussed.	3.8

Table 7 shows the mean value for seven (CPQ1 – CPQ7) questions to measure cognitive presence. The mean values of the participants' responses indicate a generally positive perception of online group work, albeit with some notable areas of concern. In all seven statements, the mean value is 3.36, suggesting an overall moderate to high level of agreement with the provided statements. However, participants expressed some difficulty initiating discussions at the beginning of group work, with a mean score of 2.8 for CPQ1. This suggests that there may be room for improvement in providing clearer guidelines or structures to facilitate the start of discussions and enhance participants' confidence.

Additionally, participants reported feeling confused over the different types of ideas discussed during online group work, as evidenced by a mean score of 2.7 for CPQ2. This indicates a potential need for clearer communication and organisation of ideas within the group to mitigate confusion and enhance collaboration. However, despite these challenges, participants expressed amazement at how many ideas were generated within the group, as indicated by a mean score of 3.4 for CPQ3. This suggests that despite initial confusion, participants value the variety of ideas from online group discussions. Furthermore, participants highly value the exchange of information facilitated by group work, with a mean score of 4 for CPQ4. This highlights the importance of group work in practising knowledge-sharing and collaborative learning experiences.

Moreover, participants indicated that their team members effectively present new information during group discussions, with a mean score of 3.7 for CPQ5. This underscores the importance of effective communication skills and knowledge sharing among group members. Additionally, group work was perceived as facilitating the connection of ideas among team members, with a mean score of 4.1 for CPQ6. This indicates that participants recognise the value of collaborative sense-making and idea integration within the group. Finally, participants reported using the new ideas discussed during online group discussions,

as evidenced by a mean score of 3.8 for CPQ7. This suggests that participants proactively apply the insights gained from group discussions to their work or learning contexts.

In summary, while participants face challenges in conducting discussions and brainstorming ideas during online group work, they highly value the exchange of information, the presentation of new ideas by team members, and the connection of ideas created by group work. These findings indicate the importance of clear communication, effective collaboration, and structured facilitation to optimise the benefits of online group work.

Findings for People

This section presents data by answering research question 2 about how learners perceive people in online group work. In the context of this study, this is measured by the social presence statement. The following section discusses the findings of the aspects of social presence while conducting online group work.

Table 8
Mean for Social presence

Items	Mean
SPQ1 In online group discussions, I can feel how happy the team is	3.4
SPQ2 In online group discussion, I can feel how unhappy the team is	2.7
SPQ3 Being online lets me show my feelings without being seen by my friends	3.2
SPQ4 I am not shy to tell the group about my new ideas	3.4
SPQ5 I am not afraid to disagree with any ideas when I am online	3.4
SPQ6 I am not afraid to voice my opinion when I am online	3.4
SPQ7 Online group discussions allow me to communicate clearly with my team members	3.3
SPQ8 Online group discussions give me a chance to collaborate on a project with the team members	3.6

Table 8 shows the mean scores for social presence in online group discussions. There are 8 statements explored in this study (SPQ1- SPQ8). From the analysis, the mean scores range from 2.7 to 3.6 (likely out of 5), indicating a moderate level of social presence felt by respondents. The highest mean score is for collaboration opportunities amongst team members in online discussions (SPQ8), with a mean score of 3.6, indicating a positive perception of teamwork and interaction. Meanwhile, respondents moderately agree that they are comfortable disagreeing and voicing opinions online (SPQ5 and SPQ6: 3.4). In addition, the clarity of communication in online discussions is also rated moderately high by the respondents (SPQ7: 3.3). Nevertheless, being online allows participants to express feelings without being seen (SPQ3: 3.2), suggesting a moderate level of comfort in expressing emotions. Meanwhile, the analysis shows that even respondents, in general, feel happiness in the team (SPQ1 and SPQ4: 3.4), but the respondents also show less adeptness at sensing unhappiness (SPQ2: 2.7). This is shown by the mean value score of each statement.

Overall, the mean score suggests that while respondents feel a moderate level of social presence and are comfortable expressing themselves and collaborating online, there is room for improvement in sensing the emotional state of the team, particularly unhappiness. The

moderate scores also imply that while the online environment facilitates communication and expression, it may not fully replicate the nuances of in-person interactions.

Findings for Environment

This section presents data by answering research question 3- How do learners perceive the environment in an online group work? In the context of this study, environment is measured by teaching presence. Thus, the next section discusses the finding on how learners' perceptions related to the instructor's teaching presence in online group work.

Table 9
Mean for Teaching Presence

Items	Mean
TPQ1 The teacher uses suitable teaching materials to explain the topic	3.9
TPQ2 The teacher shows how to complete tasks online	3.9
TPQ3 The use of templates for tasks/homework/assignments by the teacher helped me to do the task	3.9
TPQ4 I imitate what the teacher does to complete my tasks/ assignments	3.8
TPQ5 The examples used by the teacher in class helped me understand the topic better	4
TPQ6 When I see the examples used by the teacher; I can visualise (see) how I should write my example	3.8
TPQ7 The explanation by the teacher about the topic is clear to me	3.8
TPQ8 The explanation by the teacher about the task/ assignment/test is clear to me	3.9

The analysis of the mean for teaching presence with respect to students' perceptions is shown in Table 9. The finding refers to the average score or level of teaching engagement and interaction observed within a learning environment. It quantifies the extent to which instructors actively participate, facilitate discussions, provide feedback, and create a supportive atmosphere conducive to learning. According to this analysis, the learners rated all eight statements within the range of 3.8 to 4 out of 5.0, indicating that all elements contributed to teaching presence. The highest mean score was recorded by the statement "TPQ5The examples used by the teacher in class help me understand the topic better", with a value of 4. This finding is consistent with existing literature that reported similar trends (Anyau et al., 2023). The result obtained is followed by a mean score of 3.9 for another four statements, which are "TPQ1The teacher uses suitable teaching materials to explain the topic", "TPQ2The teacher shows how to complete tasks online", "TPQ3The use of templates for tasks/homework/assignments by the teacher helped me to do the task" and "TPQ8The explanation by the teacher about the task/ assignment/test is clear to me". In fact, according to Martin (2019), teachers or instructors can produce videos to review assignments, establish clear course expectations and provide chances for students to share relevant personal experiences. Additionally, in their review of the literature, Chakraborty and Nafukho (2015) reported that integrating the contents like lecture notes, adding teachers' comments, video lectures, including personalised inputs can improve the personal touch of the teacher and enable students to relate to the teacher or the instructor. Meanwhile, three statements shared the lowest mean score of 3.8, which are "TPQ4I imitate what the teacher does to complete my tasks/ assignments", "TPQ6When I see the examples used by the teacher, I can

visualise (see) how I should write my example" and "TPQ7The explanation by the teacher about the topic is clear to me".

This section presents data to answer research question 4: Is there a relationship between behaviour, people, and environment in online group work? Data is analysed using SPSS for correlations to determine if there is a significant association in the mean scores between behaviour, people, and environment in online group work. Results are presented separately in Tables 10, 11, and 12 below.

Table 10
Correlation between Environment and People

Correlations

		ENVIRONMENT	PEOPLE
ENVIRONMENT	Pearson Correlation	1	.406**
	Sig. (2-tailed)		.000
	N	130	130
PEOPLE	Pearson Correlation	.406**	1
	Sig. (2-tailed)	.000	
	N	130	130

**. Correlation is significant at the 0.01 level (2-tailed).

Table 10 shows an association between Environment and People. Correlation analysis shows that there is a moderately significant association between Environment and People (r=.406**) and (p=.000). According to Jackson (2015), the coefficient is significant at the .05 level, and positive correlation is measured on a 0.1 to 1.0 scale. A weak positive correlation would be between 0.1 to 0.3, a moderate positive correlation from 0.3 to 0.5, and a strong positive correlation from 0.5 to 1.0. This means that Environment and People also have a moderate positive relationship.

Table 11
Correlation between People and Behaviour

Correlations

		PEOPLE	BEHAVIOUR
PEOPLE	Pearson Correlation	1	.268**
	Sig. (2-tailed)		.002
	N	130	130
BEHAVIOUR	Pearson Correlation	.268**	1
	Sig. (2-tailed)	.002	
	N	130	130

**. Correlation is significant at the 0.01 level (2-tailed).

Table 11 shows an association between people and behaviour. Correlation analysis shows that there is a low significant association between People and Behaviour (r=.268**) and (p=.000). According to Jackson (2015), the coefficient is significant at the .05 level, and a positive correlation is measured on a 0.1 to 1.0 scale. A weak positive correlation would be between 0.1 to 0.3, a moderate positive correlation from 0.3 to 0.5, and a strong positive correlation from 0.5 to 1.0. This means there is also a low positive relationship between People and Behaviour.

Table 12
Correlation between Behaviour and Environment

Correlations

		BEHAVIOUR	ENVIRONMENT
BEHAVIOUR	Pearson Correlation	1	.384**
	Sig. (2-tailed)		.000
	N	130	130
ENVIRONMENT	Pearson Correlation	.384**	1
	Sig. (2-tailed)	.000	
	N	130	130

**. Correlation is significant at the 0.01 level (2-tailed).

Table 12 shows an association between behaviour and environment. Correlation analysis shows that there is a low significant association between behaviour and Environment (r=.384**) and (p=.000). According to Jackson (2015), the coefficient is significant at the .05 level, and a positive correlation is measured on a 0.1 to 1.0 scale. A weak positive correlation would be between 0.1 to 0.3, a moderate positive correlation from 0.3 to 0.5, and a strong positive correlation from 0.5 to 1.0. This means there is also a low positive relationship between Behaviour and Environment.

Conclusion

Summary of Findings and Discussions

The study investigates learners' perceptions of the environment in online group work, focusing on behaviour, social and teaching presence. The findings indicate a generally positive perception of teaching presence, with means ranging from 3.8 to 4.0 across various aspects, such as the clarity of explanations, the use of teaching materials, and the effectiveness of examples provided. Learners' express appreciation for the clarity of instructions and the usefulness of instructional materials and examples in facilitating their understanding and completion of tasks. Moreover, the study explores the relationship between behaviour, people, and environment in online group work through correlation analysis. Results suggest moderate to low positive associations between these factors, indicating that the environment, people involved, and their behaviours are interconnected in online collaborative settings. Additionally, Quraeshi et al. (2023) discovered that social media use, peer and teacher interaction, and social presence all have a favourable effect on students' engagement in active, collaborative learning and their learning outcomes. Lim et al. (2021) also found that learning pleasure is connected to teacher presence and online learning self-efficacy, and the effect of instructor presence is stronger for unstructured content than for

organised content. These findings underscore the importance of considering multiple dimensions when examining the dynamics of online group work and highlight the role of teaching presence in shaping learners' experiences and perceptions.

Pedagogical Implications and Suggestions for Future Research
This study utilises social cognitive theory and Aderibigbe's elements of presence to explore the impact of teaching, social, and cognitive presence on online group work among civil engineering undergraduates. The findings underline the importance of teaching presence, with clear instructions and excellent materials that improve the online learning experience. The moderate to low positive connections between behaviour, people, and environment point to the necessity for an integrated approach to online education. Future studies should investigate lecturer-student interactions, undertake longitudinal studies to follow changes over time and expand to different educational settings. Additionally, investigating the impact of upcoming technologies such as AI and virtual reality, as well as considering psychosocial issues such as digital presence and social isolation, can aid in developing more helpful online learning environments. Addressing these issues can maximise online group work and raise the overall quality of remote education.

Theoretical and Contextual Contribution of the Research
The study explores the significance of the online learning environment for civil engineering students at Universiti Teknologi MARA Pasir Gudang Campus, focusing on how digital and physical contexts impact collaborative efforts. By examining the use of virtual platforms, communication tools, and digital workspaces, the research provides insights into optimizing these environments for better group dynamics and learning outcomes. It also addresses challenges such as the absence of physical presence and the need for user-friendly interfaces, contributing to existing knowledge by highlighting the importance of supportive and well-designed digital environments for effective online group work.

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