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Mediating effect of psychological needs satisfaction on the relationship between presence and academic motivation during online learning

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ABSTRACT

Academic motivation is a prerequisite of human learning and development. There are direct and indirect predictors that address the problem of declining academic motivation of undergraduates during online learning. As lack of interaction has been cited as a central reason for reduced academic motivation in online learning, this study examined the association between presences (cognitive, social, and teaching) and academic motivation. Recent systematic reviews and meta-analyses have found psychological needs satisfaction to be related to autonomous motivation and indicators of wellbeing. As such, this study examined the mediating role of psychological needs satisfaction on the relationship between presences and academic motivation during online learning among undergraduates in Malaysia. Two hundred and fifty students from private universities across the country were recruited via convenience sampling. A correlational research design was employed and participants filled in a cross-sectional online survey. Results revealed that there are significant positive relationships between presences and autonomous academic motivation as well as presences and controlled academic motivation. There was also a significant negative relationship between presences and academic amotivation. Further, it was found that psychological needs satisfaction significantly mediated the relationships between presences and autonomous academic motivation as well as presences and academic amotivation. Psychological needs satisfaction, however, did not significantly mediate the relationship between presences and controlled academic motivation. These findings provide insights into addressing the problem of low academic motivation during online learning, in turn, aid university administration to address the higher rates of attrition in online learning.

Contribution/Originality: This study helps in addressing the gap in the literature on explanatory mechanisms of the relationship between presences and academic motivation. This study found that psychological needs satisfaction significantly mediated the relationships between presences and autonomous academic motivation, and presences and academic amotivation.

1. INTRODUCTION

An escalation in the number of online learning programmes is witnessed across the globe (Cleary, 2021). The adoption of online learning in tertiary institutions has been expedited by the recent COVID-19 pandemic, and this trend is expected to persist for years to come (Kim & Gurvitch, 2020). By providing flexible access to education,

online learning allows students who are unable to take full-time, on-campus programs due to reasons such as employment, travel cost, and caretaking responsibility, to still pursue their educational dreams. Similarly, it offers greater flexibility to instructors. Online learning allows educational institutions to expand enrolments to nontraditional learners as well.

Experts assert that the proliferation of online learning has created a parallel attrition problem at the tertiary education level across the world. Declining academic motivation has been cited as one of the primary causes of undergraduates dropping out of their studies (Cleary, 2021; Colferai & Gregory, 2015). Undergraduates in Malaysia report being more dissatisfied than satisfied with their online learning and they note lack of in-person interaction with the lecturers and peers as the primary reason for their reduced motivation during online learning (Chung, Subramaniam, & Dass, 2020; Wijeratne, Thomas, Amaranathan, Chandru, & Don, 2020). As academic motivation is viewed as one of the most essential features of human learning and development (Rowell & Hong, 2013) it becomes paramount to better understand the predictors of superior academic motivation. Presence, which is the sense of connection and fitting in with a community, has been suggested as an important predictor of academic motivation (Kucuk & Richardson, 2019; Zilka, Cohen, & Rahimi, 2018). Even though the association between presence and academic motivation has been suggested in existing literature, the studies investigating the explanatory mechanisms of this relationship remain limited.

Recent systematic reviews and meta-analyses have discovered psychological needs satisfaction to be associated with autonomous motivation and indicators of well-being (Tang, Wang, & Guerrien, 2020; Vasconcellos et al., 2020). Studies investigating the alluded mediating role of psychological needs satisfaction on the relationship between presence and academic motivation, particularly in collectivistic cultures, remain limited. Consequently, this study is an attempt to investigate the mediating role of psychological needs satisfaction on the relationship between presence and academic motivation during online learning among undergraduates in Malaysia. Specifically, this study aimed to answer the following research questions.

1. Is there a significant relationship between (i) presences (cognitive, social, and teaching) and autonomous academic motivation, (ii) presences and controlled academic motivation, and (iii) presences and academic amotivation?
2. Does psychological needs satisfaction significantly mediate the relationship between (i) presences and autonomous academic motivation, (ii) presences and controlled academic motivation, and (iii) presences and academic amotivation?

2. LITERATURE

Academic motivation refers to the cause of behaviours linked to academic performance and achievement (Schunk, Pintrich, & Meece, 2008). Consistent with Deci, Vallerand, Pelletier, and Ryan (1991) theorization, Vallerand et al. (1992) proposed that academic behaviours can be intrinsically motivated, extrinsically motivated, or a motivated. Extrinsic motivation constitutes external regulation, introjected regulation, identified regulation, and integrated regulation. Deci and Ryan (2000) conceptualized motivation to be varying on a self-determination continuum and proposed three alternative types of motivation namely, autonomous motivation, controlled motivation, and amotivation. Autonomous motivation refers to the source of behaviours driven by personal determination, characterized by a strong sense of free will and choice. Intrinsic motivation and identified and integrated regulations of external motivation make up autonomous motivation. Controlled motivation refers to the source of behaviours that are non-self-determined, that is, with a sense of pressure to perform an action. External and introjected regulations of extrinsic motivation formulate controlled motivation. Finally, amotivation refers to a state of not intending to take an action.

While academic motivation is regarded as one of the most essential features of human learning and development, it has been found to decline at the tertiary education level (Li, Frieze, Nokes-Malach, & Cheong, 2013;

Trolian & Jach, 2020). This declining academic motivation becomes an even more serious problem in online learning contexts, which leads to undesirable consequences such as dropping out of studies. Amotivation has been recognized as a prominent obstacle encountered by university students in Malaysia, particularly during the COVID-19 pandemic (Chung et al., 2020). Tan (2020) also reported that students lose motivation in online learning environments, particularly during the COVID-19 pandemic. Similarly, low levels of academic motivation are also recorded in research reports from other neighboring collectivistic nations. For instance, 40% of Thailand university students have only medium to low levels of motivation in e-Learning (Na, Petsangsri, & Tasir, 2020).

It is noteworthy that the recorded amotivation among university students, particularly in Malaysia, was due to the lack of in-person interaction with the lecturers and peers (Chung et al., 2020). Moreover, undergraduates in Malaysia were found to be more dissatisfied with their online learning than satisfied. These learners also regarded online education to be less impactful compared to traditional in-person classroom education. Specifically, 77.7% of undergraduates reported that online classes did not offer an equivalent educational value as traditional classes (Wijeratne et al., 2020). This is consistent with the claim that online learning and isolation from peers create unwarranted frustration, anger, resentment, and ultimately anxiety among undergraduates in Malaysia (Sundarasen et al., 2020). As such, it is crucial to study the predictors of academic motivation to address the problem of declining academic motivation. However, the literature on the conditions that maintain academic motivation, particularly, the different types of academic motivation is still relatively scarce (Levpušček & Podlesek, 2019).

As lack of interaction has been repeatedly cited as the reason for reduced academic motivation in online learning (Chung et al., 2020) presence emerges as an important factor to consider. Presence comprised of three types namely cognitive presence, social presence, and teaching presence (Garrison, Anderson, & Archer, 1999; Joo, Lim, & Kim, 2011). Cognitive presence pertains to how effectively an individual can develop understanding by engaging in ongoing communication. Social presence refers to the degree to which a learner can convey their individual attributes, thereby presenting themselves as authentic individuals to others. Lastly, teaching presence encompasses the planning, guiding, and steering of cognitive and social processes to achieve personally and educationally significant learning outcomes (Anderson, Rourke, Garrison, & Archer, 2001; Garrison et al., 1999). Although the link between presence and academic motivation has been suggested in existing literature, studies examining the explicit link between presence and academic motivation are still relatively scarce. The majority of studies on presence, especially those based on the principles of the Community of Inquiry Framework, have been concentrated in North American contexts (Castellanos-Reyes, 2020). Studies examining the relationship between presence and academic motivation in the Malaysian context remain limited.

Moreover, even though the relationship between presence and academic motivation has been suggested in existing literature, the studies investigating the explanatory mechanisms of this relationship remain limited. While existing literature alludes to the possibility of psychological needs satisfaction, to the authors' current understanding, there has been no investigation into the mediating role of psychological needs satisfaction on the association between presence and academic motivation. Further, despite the existence of a considerable amount of research on psychological needs satisfaction, they are limited in their capacity to generalize to collectivistic cultures as most researchers have utilized Western individualistic samples. As such, researchers have called for further investigation of psychological needs satisfaction in collectivistic cultures like Malaysia (Feng & Zhang, 2021).

2.1. Association between Presence and Academic Motivation

A correlational study involving about 700 online university students in North America found that teaching presence is associated with student motivation (Baker, 2010). Similarly, Cole et al. (2017) studied the role of teaching presence in motivation toward online courses using a North American undergraduate sample of 190 students. They found teaching presence to predict student motivation towards online courses. However, the direction of the predictive relationship did not occur in the hypothesized direction. That is, the researchers

hypothesized a positive association between teaching presence and student motivation while the results revealed a negative association. Among other reasons, sample characteristics, particularly, student age are identified as a potential reason for the inconsistency by the researchers, thus warranting further research using a more representative sample. Additionally, Zilka et al. (2018) conducted a mixed-method study involving over 480 students in Israel to study social and teaching presences. The researchers utilized combination of closed-ended and open-ended questions and found that social and teaching presences are associated with students' motivation in virtual and blended courses.

More locally, Tan (2020) explored the effect of the COVID-19 pandemic on the motivation of undergraduates in Malaysia. Quantitative data gathered from over 280 university students revealed that cognitive, social, and teaching presences are positively associated with learning motivation. However, most studies discussed above studied academic motivation in general without considering the different types of academic motivation. Researchers have also noted that the literature on the conditions that maintain the different types of academic motivation is still relatively scarce (Levpušček & Podlesek, 2019). Studying the different types of academic motivation namely autonomous academic motivation, controlled academic motivation, and academic amotivation would provide a more nuanced understanding of the link between presence and academic motivation. In addition, as stated above, the majority of studies on presence, based on the principles of the Community of Inquiry Framework, have been concentrated in North American contexts (Castellanos-Reyes, 2020). Thus, further studies examining the relationship between presence and academic motivation in the Malaysian context are warranted.

2.2. Association between Presence and Psychological Needs Satisfaction

A correlational study involving about 280 university students from China found a positive association between teaching presence and psychological needs satisfaction (Zhao & Ma, 2018). The researchers elaborated that course design and organization, and direct teaching aspects play a role in all three psychological needs satisfaction. Evaluation and feedback influence autonomy and competence needs satisfaction while discourse promotion and guidance impact relatedness need satisfaction. Extending on these findings, a study conducted more recently by Turk, Heddy, and Danielson (2022) gathered data from about 460 students enrolled in online courses at North American universities via a cross-sectional survey, and provided important insights on the relationship between presence and psychological needs satisfaction. Specifically, the researchers found that teaching and social presences are significant positive predictors of satisfaction of psychological needs for autonomy, competence, and relatedness. While these studies attest to the link between presence and psychological needs satisfaction, further research encompassing all three presences namely cognitive, social, and teaching are warranted as studies directly examining the association between cognitive presence and psychological needs satisfaction remain sparse.

2.3. Association between Psychological Needs Satisfaction and Academic Motivation

Ma, Shek, and Lai (2016) study involving over 2000 Chinese participants found that psychological needs satisfaction is positively related to motivation. Liu and Chung (2016) study involving a similar sample of over 460 Chinese university students reported that psychological needs satisfaction, specifically, autonomy and competence but not relatedness needs satisfaction, is linked to students' intrinsic motivation. In contrast, qualitative analysis of interview responses from 17 university students from North America by Trenshaw, Revelo, Earl, and Herman (2016) revealed that relatedness needs satisfaction assumes a more significant role in students' intrinsic motivation. The difference in findings between Liu and Chung (2016) and Trenshaw et al. (2016) particularly in relation to relatedness needs satisfaction, allude to a potential cultural difference in the way psychological needs satisfaction operates. Karimi and Sotoodeh (2020) studied the association between psychological needs satisfaction and academic motivation, specifically, intrinsic motivation among 365 public university students in western Iran. The researchers found that psychological needs satisfaction directly and positively affected intrinsic motivation. Similarly, a study

involving over 370 Massive Open Online Courses students found that psychological needs satisfaction has significant positive effects on intrinsic motivation (Sun, Ni, Zhao, Shen, & Wang, 2019). Most studies discussed above however did not account for other types of autonomous academic motivation, that is, identified and integrated regulations of external motivation. Further, a correlational study involving over 120 Slovenian university students investigated the links between, among other variables, psychological needs satisfaction and academic motivation (Levpušček & Podlesek, 2019). It was reported that amotivation is negatively related to psychological needs satisfaction, particularly, autonomy and competence needs. A cross-sectional correlational study involving over 920 students from South America also revealed that psychological needs satisfaction is positive correlated with autonomous motivation (Orsini, Binnie, Wilson, & Villegas, 2018). Recent systematic reviews and meta-analyses further established a strong positive correlation between psychological needs satisfaction and autonomous motivation, and a moderate negative correlation between the former and amotivation (Tang et al., 2020; Vasconcellos et al., 2020). While the abovementioned findings are insightful, scholars like Wu, Lai, and Chan (2014) and Zhou, Ntoumanis, and Thøgersen-Ntoumani (2019) have argued that such findings from Western cultures may not apply to Eastern cultures as the former is individualistic and emphasizes the self while the latter is more collectivistic and stresses social obligations. Studies have also indicated that the association between relatedness needs satisfaction and academic motivation may be more robust for marginalized communities compared to majority groups (Urdan & Bruchmann, 2018) thus warranting further research in the Malaysian context.

2.4. Current Study

The current study aims to examine the association between presences and academic motivation as well as the mediating role of psychological needs satisfaction on the relationship between presences and academic motivation during online learning among undergraduates in Malaysia. Consistent with past studies discussed above, it was hypothesized that there are significant relationships between presences and autonomous academic motivation, presences and controlled academic motivation, and presences and academic amotivation. Further, it was hypothesized that psychological needs satisfaction mediates the relationships between presences and autonomous academic motivation, presences and controlled academic motivation, and presences and academic amotivation. Consistent with Garrison et al. (1999) Community of Inquiry Framework, Deci and Ryan (2000) and Ryan and Deci (2017) Self-Determination Theory and Basic Psychological Needs Theory, presence facilitates meaning making, personal expression, and building understanding among students. These, in turn, enhance psychological needs satisfaction, which ultimately promotes academic motivation. Specifically, interest, enjoyment, and internalization that result from psychological needs satisfaction facilitate academic motivation.

3. METHOD

A correlational research design was employed in this study. There were three predictor variables, one criterion variable, and one mediating variable.
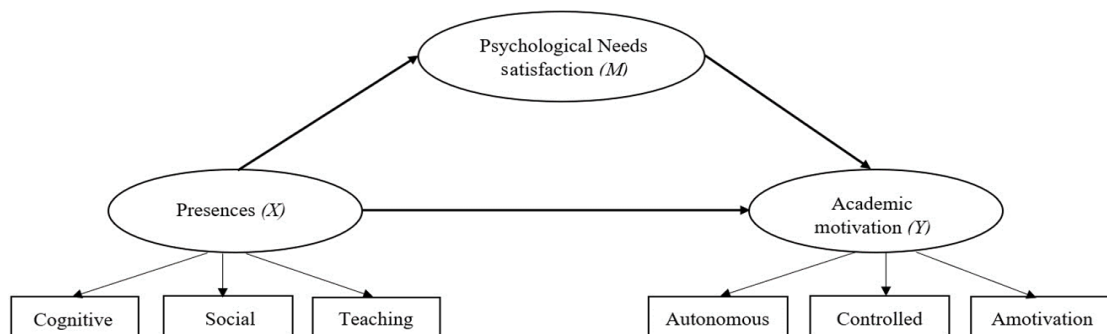

Figure 1. A priori model of the study.

Cognitive, social, and teaching presences were the predictor variables. Academic motivation is the criterion variable of the study with three components namely autonomous academic motivation, controlled academic motivation, and academic amotivation. Psychological needs satisfaction is the mediating variable. The study data were collected using a quantitative research method, specifically through a cross-sectional online survey. A priori model of the study is presented in Figure 1.

3.1. Participants

Three hundred eighty-eight students who were pursuing their tertiary education in private universities across the country were identified via convenience sampling for this study. Specifically, the university academic or administrative staff were contacted via email, requesting them to forward the online survey link to their respective students. The online survey link on social media platforms including Facebook and LinkedIn was also shared to reach potential participants. Although there were concerns with generalizability due to the non-probabilistic nature of convenience sampling, ensuring the representativeness of the sample would still yield a valid sample in resource-limited contexts (Zhao, 2021). This was achieved by recruiting participants from a range of private universities in the current study. The final data analysis involved 250 participants only as responses from 138 of the participants were deemed invalid as they did not fulfil the participation criteria of being an undergraduate and/or failed to answer one or more of the three attention check questions correctly. The final sample consisted of 174 (69.6%) female and 76 (30.4%) male participants with a mean age of 30.52 years old (SD = 9.07). 42.4% of participants identified as Malay, 21.6% as Indian, 20.0% as Chinese, another 13.6% as Bumiputera Sabah/Sarawak, and the remaining 2.4% identified as members of other ethnic groups. 99.6% of the participants were Malaysian students, with only one international student. 13.6% of the participants self-reported having low socioeconomic status, 69.6% in the middle, and 16.8% having high socioeconomic status. Participants were from diverse academic majors and year of study.

3.2. Measures

3.2.1. Presence

Presence was measured using the Community of Inquiry Survey (COI Survey; Arbaugh et al. (2008)). The COI Survey is a 34-item self-report instrument consisting of 12 items measuring cognitive presence, nine items measuring social presence, and 13 items measuring teaching presence.

3.2.2. Academic Motivation

Academic motivation was measured using the Academic Motivation Scale (AMS; Vallerand et al. (1992)). The AMS is a 28-item self-report measure that aims to capture the reasons as to why a student goes to university. Autonomous academic motivation is captured by intrinsic motivation to know, intrinsic motivation toward accomplishment, intrinsic motivation to experience stimulation, and extrinsic identified regulation subscales. Controlled academic motivation is captured by extrinsic external regulation and extrinsic introjected regulation subscales while amotivation is assessed by the amotivation subscale.

3.2.3. Psychological Needs Satisfaction

Psychological needs satisfaction was measured using the Basic Psychological Need Satisfaction and Frustration Scale (BPNSFS; Chen et al. (2015)). The BPNSFS is a 24-item self-report measure that assesses the satisfaction and frustration of the psychological needs for autonomy, competence, and relatedness. In the current study, the items are adapted for an online learning context, primarily by adding the phrase "in this online course" to all items, similar to studies such as Wang et al. (2019) and Müller et al. (2021).

3.3. Procedure

The current study's online survey was shared using Google Forms web application. Participants were first presented with an information letter and informed consent form. Participants who gave their consent were requested to choose and state one academic course that they were doing fully online, that is, attending lectures or tutorials and completing assessments online, in the current academic semester to reflect on or think about for the next two questionnaires. Participants were then requested to fill in a series of questionnaires measuring the variables of the study namely the COI Survey, BPNSFS, and AMS. Three attention check questions were inserted in between the items for the COI Survey and BPNSFS. Attention check questions have been suggested as one of the key ways to identify inattentive respondents and enhance the data quality (Maniaci & Rogge, 2014). Finally, participants were required to fill in the demographic information form, which contains items on age, gender, ethnicity, nationality, socioeconomic status, name of university, major, and year of study. The current research project was sent for institutional review and approval before the commencement of the study.

4. RESULTS

Firstly, the study data were screened for missing values and outliers. This was followed by checking of assumption of linearity. Graphical inspection of the scatterplots suggested straight-line relationships between the study variables. Thereafter, preliminary analyses were performed to generate the internal consistencies, means, and standard deviations of the study variables as well as the bivariate correlations between the variables. Pearson's *r* with bootstrapping (with 5000 samples) was then performed to test the relationship between presence and academic motivation. Finally, PROCESS macro for SPSS (Model 4; (Preacher & Hayes, 2004, 2008)) with bootstrapping (with 5000 samples) was utilized to test the mediating effect of psychological needs satisfaction on the relationship between presence and academic motivation.

The internal consistencies, means, and standard deviations of presence, academic motivation, and psychological needs satisfaction, as well as the bivariate correlations between the variables are presented in Table 1.

Table 1. Internal consistencies, means, standard deviations, and bivariate correlations.

Variable	α	M	SD	1	2	3	4	5	6	7
1. Cognitive presence	0.95	4.07	0.74	-						
2. Social presence	0.92	3.89	0.79	0.80*	-					
3. Teaching presence	0.97	4.13	0.81	0.77*	0.72*	-				
4. Autonomous academic motivation	0.87	5.88	0.79	0.32*	0.31*	0.20*	-			
5. Controlled academic motivation	0.83	5.74	1.03	0.16*	0.17*	0.16*	58*	-		
6. Academic amotivation	0.80	2.05	1.25	-0.16*	-0.19*	-0.17*	-0.25*	-0.07	-	
7. Psychological needs satisfaction	0.93	3.91	0.73	0.49*	0.53*	0.38*	0.42*	0.12	-0.46*	-

Note: * = This is statistically significant at p < 0.05.

4.1. Relationship between Presence and Academic Motivation

It was hypothesized that there are significant relationships between presences and autonomous academic motivation, presences and controlled academic motivation, and presences and academic amotivation. As hypothesized, results revealed that there are significant positive relationships between cognitive presence and autonomous academic motivation, $r(248) = .32$, $p < .001$, 95% CI [.20, .44]; social presence and autonomous academic motivation, $r(248) = .31$, $p < .001$, 95% CI [.18, .43]; and teaching presence and autonomous academic motivation, $r(248) = .20$, $p = .001$, 95% CI [.08, .33]. Results also revealed that there are significant positive relationships between cognitive presence and controlled academic motivation, $r(248) = .16$, $p = .012$, 95% CI [.03,

.30]; social presence and controlled academic motivation, $r(248) = .17$, $p = .008$, 95% CI [.03, .31]; and teaching presence and controlled academic motivation, $r(248) = .16$, $p = .013$, 95% CI [.04, .28]. Further, it was found that there are significant negative relationship between cognitive presence and academic amotivation, $r(248) = -.16$, $p = .010$, 95% CI [-.29, -.04]; social presence and academic amotivation, $r(248) = -.19$, $p = .003$, 95% CI [-.31, -.06]; and teaching presence and academic amotivation, $r(248) = -.17$, $p = .008$, 95% CI   [-.30, -.04].

4.2. Psychological Needs Satisfaction as Mediator on the Relationship between Presence and Academic Motivation

It was hypothesized that psychological needs satisfaction mediates the relationship between presences and autonomous academic motivation. Results revealed that the mediation model with cognitive presence and psychological needs satisfaction as the predictors of autonomous academic motivation was significant, $F(2, 247) = 29.37$, $p < .001$, $R^2 = .19$. There was a significant indirect effect of cognitive presence on autonomous academic motivation through psychological needs satisfaction, $b = 0.18$, BCa CI [0.09, 0.30]. Additionally, results revealed that the mediation model with social presence and psychological needs satisfaction as the predictors of autonomous academic motivation was significant, $F(2, 247) = 27.99$, $p < .001$, $R^2 = .18$. There was a significant indirect effect of social presence on autonomous academic motivation through psychological needs satisfaction, $b = 0.19$, BCa CI [0.10, 0.29]. Further, the mediation model with teaching presence and psychological needs satisfaction as the predictors of autonomous academic motivation was significant, $F(2, 247) = 26.53$, $p < .001$, $R^2 = .18$. There was a significant indirect effect of teaching presence on autonomous academic motivation through psychological needs satisfaction, $b = 0.15$, BCa CI [0.08, 0.24]. Collectively, the results support the hypothesis that psychological needs satisfaction mediates the relationship between presence and autonomous academic motivation. The resulting model is presented in Figure 1.
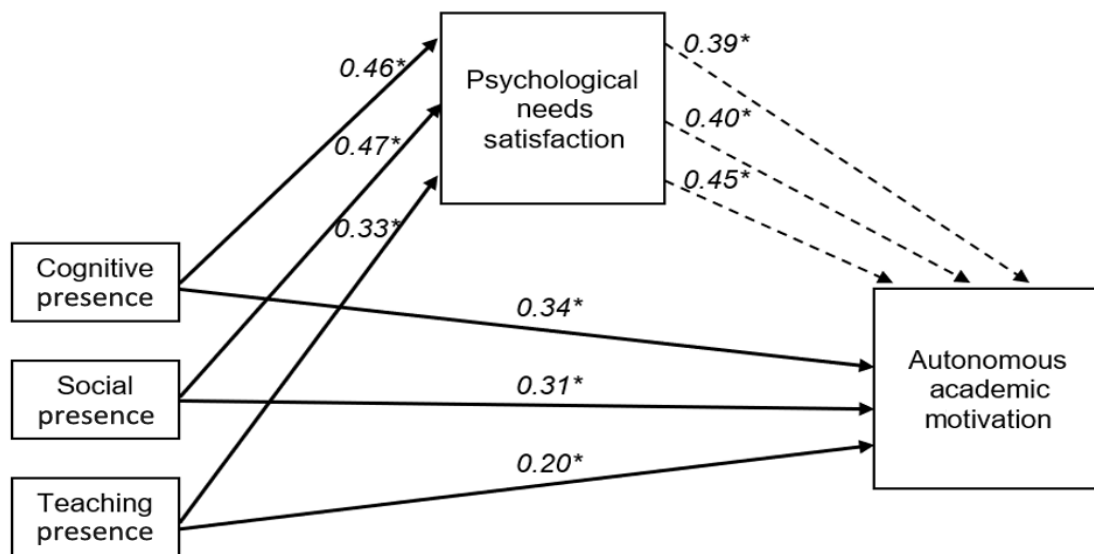

Figure 1. Structural model of the relationships between presence, autonomous academic motivation, and psychological needs satisfaction.
Note: *=Significant at the $p < 0.01$ level.

In addition, it was hypothesized that psychological needs satisfaction mediates the relationship between presences and controlled academic motivation. Results revealed that the mediation model with cognitive presence and psychological needs satisfaction as the predictors of controlled academic motivation was significant, $F(2, 247) = 3.43$, $p = .034$, $R^2 = .03$. However, there was no significant indirect effect of cognitive presence on controlled academic motivation through psychological needs satisfaction, $b = 0.03$, BCa CI [-0.08, 0.15]. Additionally, the mediation model with social presence and psychological needs satisfaction as the predictors of controlled academic motivation was significant, $F(2, 247) = 3.69$, $p = .026$, $R^2 = .03$. However, there was no significant indirect effect of

social presence on controlled academic motivation through psychological needs satisfaction, $b = 0.03$, BCa CI [-0.09, 0.13]. Further, the mediation model with teaching presence and psychological needs satisfaction as the predictors of controlled academic motivation was significant, $F(2, 247) = 3.56$, $p = .030$, $R^2 = .03$. However, there was no significant indirect effect of teaching presence on controlled academic motivation through psychological needs satisfaction, $b = 0.03$, BCa CI [-0.05, 0.11]. Collectively, the results do not support the hypothesis that psychological needs satisfaction mediates the relationship between presence and controlled academic motivation. The resulting model is presented in Figure 2. Furthermore, it was hypothesized that psychological needs satisfaction mediates the relationship between presences and academic amotivation. It was found that the mediation model with cognitive presence and psychological needs satisfaction as the predictors of academic amotivation was significant, $F(2, 247) = 34.94$, $p < 0.001$, $R^2 = .22$.
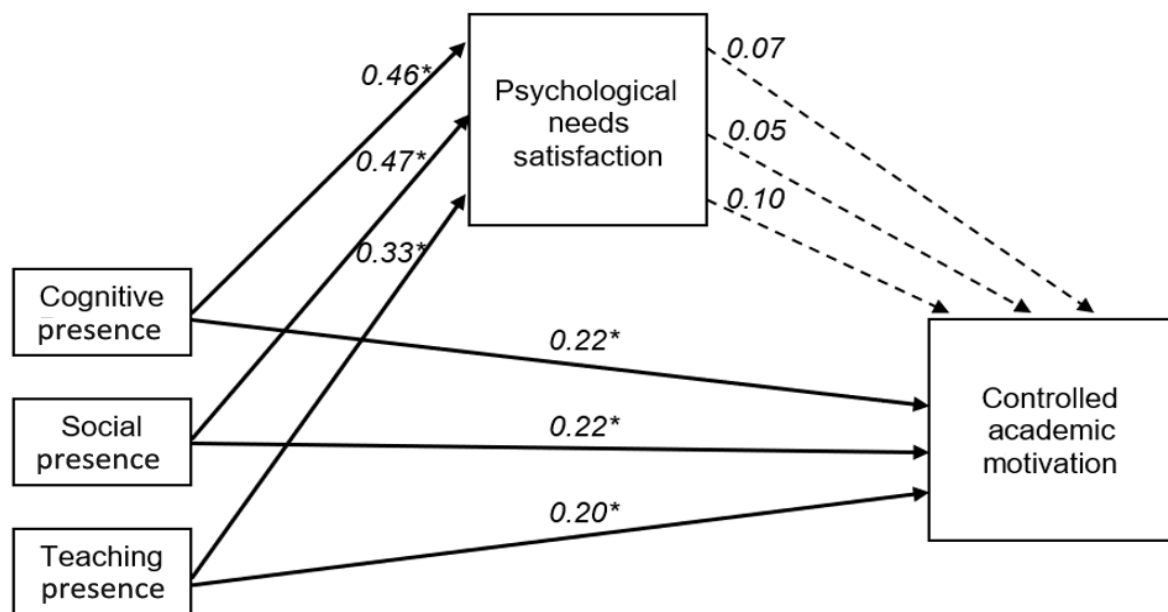

Figure 2. Structural model of the relationships between presence, controlled academic motivation, and psychological needs satisfaction.
Note: *=Significant at the $p < 0.01$ level.

There was a significant indirect effect of cognitive presence on academic amotivation through psychological needs satisfaction, $b = -0.42$, BCa CI [-0.64, -0.26]. Additionally, the mediation model with social presence and psychological needs satisfaction as the predictors of academic amotivation was significant, $F(2, 247) = 34.88$, $p < .001$, $R^2 = .22$.

There was a significant indirect effect of social presence on academic amotivation through psychological needs satisfaction, $b = -0.43$, BCa CI [-0.63, -0.27]. Further, the mediation model with teaching presence and psychological needs satisfaction as the predictors of academic amotivation was significant, $F(2, 247) = 33.84$, $p < .001$, $R^2 = .22$.

There was a significant indirect effect of teaching presence on academic amotivation through psychological needs satisfaction, $b = -0.28$, BCa CI [-0.45, -0.15]. Collectively, the results support the hypothesis that psychological needs satisfaction mediates the relationship between presence and academic amotivation. The resulting model is presented in Figure 3.
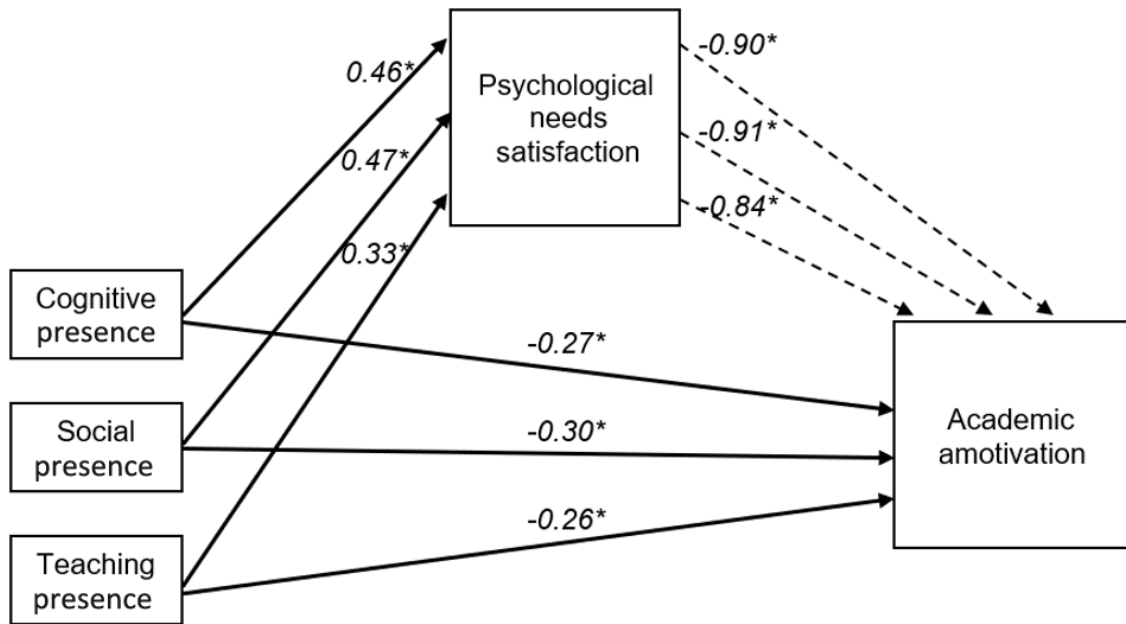
Figure 3. Structural model of the relationships between presence, academic amotivation, and psychological needs satisfaction.
Note: *=Significant at the $p < 0.01$ level.

A summary of all mediating effects of the current study is presented in Table 2.

Table 2. Summary of mediating effects.

Mediation path	Indirect effect estimation	Standard error (SE)	95% CI	
			LL	**UL**
CP → PNS → AAM	0.18	0.05	0.09	0.30
SP → PNS → AAM	0.19	0.05	0.10	0.29
TP → PNS → AAM	0.15	0.04	0.08	0.24
CP → PNS → CAM	0.03	0.06	-0.08	0.15
SP → PNS → CAM	0.03	0.06	-0.09	0.13
TP → PNS → CAM	0.03	0.04	-0.05	0.11
CP → PNS → AA	-0.42	0.10	-0.64	-0.26
SP → PNS → AA	-0.43	0.09	-0.63	-0.27
TP → PNS → AA	-0.28	0.08	-0.45	-0.15

Note: CP = Cognitive presence; SP = Social presence; TP = Teaching presence; PNS = Psychological needs satisfaction; AAM = Autonomous academic motivation; CAM = Controlled academic motivation; AA = Academic amotivation; CI = Confidence interval; LL = Lower limit; UL = Upper limit.

5. DISCUSSION

It was hypothesized that there are significant relationships between presences and autonomous academic motivation, presences and controlled academic motivation, and presences and academic amotivation. As hypothesized, the results of the current study revealed that there are significant relationships between presences and autonomous academic motivation, presences and controlled academic motivation, and presences and academic amotivation. These findings are mostly consistent with past research such as Baker (2010) and Cole et al. (2017) which found that teaching presence is significantly related to academic motivation. The current study findings align with previous studies that has recorded that academic motivation increases as social presence increases (Mitchell, Cours Anderson, Laverie, & Hass, 2021; Zilka et al., 2018). More specifically, as presence facilitates meaning making, personal expression, and building understanding, increased level of presence increases the level of autonomous academic motivation. To elaborate, cognitive presence aids the process of resolving challenges in learning contexts and thus promotes meaning making. Social presence encourages open expression of personal meanings and emotions in educational contexts, while teaching presence enables building understanding of the

learning materials and realization of personally and educationally meaningful learning outcomes via teacher guidance. Collectively, cognitive, social, and teaching presences promote self-determined behaviours in learning contexts, that is, autonomous academic motivation. The reverse is true for academic amotivation. Specifically, as increased level of presence promotes meaning making, personal expression, and building understanding, the increased level reduces academic amotivation or the lack of intention to act.

Further, an increase in the level of presence corresponds to an increase in the level of controlled academic motivation. However, the strength of the relationship between presences and controlled academic motivation ($r = .16 - .17$) is lower than the strength of the relationship between presences and autonomous academic motivation ($r = .20 - .32$). Although the r values for both relationships fall under the category of small effect (Cohen, 1988) the r values for the latter are much closer to the zone of desired effect in the educational context $- r = .40$ (Hattie, 2009). As controlled academic motivation pertains to behaviours that are non-self-determined or with a sense of pressure to perform an action, it is not as strongly related to presence that deals with personal meaning-making, personal expression of meanings and emotions, and personal understanding of learning materials. In sum, presence promotes a sense of volition and choice and thus higher levels of autonomous academic motivation and controlled academic motivation, and lower levels of academic amotivation. Further, although all three forms of presence namely cognitive, social, and teaching presences, are associated with academic motivation, the strength is the strongest for the relationship between social presence and academic motivation. As lack of interaction has been cited as a central reason for reduced academic motivation in online learning (Chung et al., 2020) the opportunity to present themselves as "real" persons with unique characteristics warranted by social presence seemed to have the greatest influence on students, particularly on their academic motivation.

In addition, it was hypothesized that psychological needs satisfaction significantly mediates the relationships between presences and autonomous academic motivation, presences and controlled academic motivation, and presences and academic amotivation. The results of the current study revealed that psychological needs satisfaction significantly mediates the relationships between presences and autonomous academic motivation as well as presences and academic amotivation. Psychological needs satisfaction, however, does not significantly mediate the relationship between presences and controlled academic motivation. The findings are generally consistent with existing literature. For instance, the findings are in line with Turk et al. (2022) which has established the association social presence and psychological needs satisfaction as well as Zhao and Ma (2018) which has recorded a correlation between cognitive and teaching presences and psychological needs satisfaction. The findings are also consistent with recent systematic reviews and meta-analyses that reported a positive correlation between psychological needs satisfaction and autonomous motivation, and a negative correlation between the former and amotivation (Tang et al., 2020; Vasconcellos et al., 2020). The current study findings align with past studies that have established that psychological needs satisfaction mediates the association between support from social agents (i.e., parents, teachers, peers) and student motivation as well (Zhou et al., 2019).

As discussed above, presence promotes meaning making, personal expression, and building understanding, which in turn, enhances psychological needs satisfaction. Psychological needs satisfaction then enhances interest and enjoyment of academic tasks, which results in higher intrinsic motivation. Psychological needs satisfaction also boosts internalization (transforming regulation into regulation by internal processes), which is the essential element of identified and integrated regulations of external motivation. Collectively, interest, enjoyment, and internalization that result from psychological needs satisfaction facilitate autonomous academic motivation. The reverse is true for the relationship between presence and academic amotivation, through psychological needs satisfaction. As psychological needs satisfaction enhances intrinsic motivation and identified and integrated regulations of external motivation, it reduces the level of academic amotivation. As controlled academic motivation pertains to behaviours that are non-self-determined or with a sense of pressure to perform an action, it is not greatly influenced by

psychological needs satisfaction that captures one's sense of independence (autonomy), connection with others (relatedness), and efficacy (competence).

5.1. Limitations of the Study

While this study shed light on the mediation effect of psychological needs satisfaction on the relationships between presence and academic motivation of undergraduates during online learning, it has some limitations. Firstly, the study is not able to establish cause and effect between study variables due to the correlational nature of the study. Further, as the study employed convenience sampling, individual factors such as students' ethnicity, socioeconomic status, and academic major were not fully controlled. This limits the generalizability of the study findings to all undergraduates in Malaysia and beyond as there could be systematic variations between students of different sociodemographic backgrounds. In addition, this study involved self-reporting of undergraduates' perception of several variables including academic motivation, presence, and psychological needs satisfaction. Although data gathered via self-report provide vital insights into the topic of study, they may have been contaminated by participants' social desirability bias. The resulting data may not be as objective. The current study was also cross-sectional in nature. As such, long-term changes in academic motivation and its predictors were not captured.

5.2. Recommendations for Practice and Future Research

University lecturers should be more mindful and continuously work on enhancing presence in an effort to increase students' academic motivation, particularly autonomous academic motivation. Specifically, lecturers should create opportunities for students to construct meaning through continued communication during online learning. Spaces should also be created for students to convey their individual attributes, thereby presenting themselves as authentic individuals to others during online learning. Lecturers should plan, guide, and steer cognitive and social processes for students to achieve personally and educationally significant learning outcomes. These steps to increase the level of presence would address the problem of isolation from peers and lecturers which is frequently cited as a factor for reduced motivation during online learning. University administrations should support these efforts by providing essential tools and training to the lecturers. Furthermore, tertiary institutions should focus on students' psychological needs satisfaction more to improve academic motivation. University administrations can work with both the faculty members and students to create new or enhance existing avenues that promote students' psychological needs satisfaction, that is, fulfilment of autonomy, competence, and relatedness needs, during online learning. Specifically, opportunities need to be created for the fulfilment of students' need for freedom to self-organize and make own choices, that are consistent with their integrated sense of self. Students' desire to have an impact on their environment and accomplish valued outcomes in it should be supported. Opportunities should also be created for the fulfilment of students' need to experience authentic connections with, hold affection and concern for others, and to receive affection and care from others.

As the current study has established the mediation role of psychological needs satisfaction on the relationships between presence and academic motivation, future studies may expand on the correlational design and investigate the stated relationships by employing an experimental design. Specifically, levels of presence can be manipulated and the resulting effect on psychological needs satisfaction, and in turn, academic motivation can be observed. Such experimental studies can also inform potential interventions that university lecturers and administrations may implement to enhance presence and psychological needs satisfaction. In addition, future researchers may investigate the moderating role of sociodemographic variables including age, gender, ethnicity, socioeconomic status, academic major, and year of study. In addition, as differences can be expected between local and international students studying at private universities in Malaysia, future researchers may attempt to recruit a higher number of

international students and examine if nationality influences the stated relationships. Cross-cultural and cross-national comparison studies can be employed as well.

Furthermore, future researchers may investigate the mediating role of psychological needs satisfaction on the relationships between presence and academic motivation during online learning utilising a longitudinal study. The current snapshot study did not capture the long-term changes, especially in regard to students' academic motivation. Collecting data at different time periods, specifically, presence at Time 1, psychological needs satisfaction at Time 2, and academic motivation at Time 3, with a gap of at least two weeks in between the measurements, would be fruitful. Finally, as the current study employed quantitative methodology only, a mixed-methods research that also captures students' lived experiences during online learning, especially in regards to presence, psychological needs satisfaction, and academic motivation, may offer a broader and more encompassing comprehension of the topic in the future.

6. CONCLUSION

As lack of interaction has been cited as a central reason for reduced academic motivation in online learning, this study investigated the association between presences and academic motivation. Recent systematic reviews and meta-analyses have discovered psychological needs satisfaction to be associated with autonomous motivation and indicators of well-being. As such, this study examined the mediating role of psychological needs satisfaction on the relationship between presences and academic motivation during online learning among undergraduates in Malaysia. The results of the study revealed that there are significant positive relationships between presences and autonomous academic motivation, and presences and controlled academic motivation. There is also a significant negative relationship between presences and academic amotivation. Furthermore, the results of the study suggested that psychological needs satisfaction significantly mediates the relationships between presences and autonomous academic motivation as well as presences and academic amotivation. Psychological needs satisfaction, however, does not significantly mediate the relationship between presences and controlled academic motivation.

The current research has helped in addressing the gap in the literature on explanatory mechanisms of the relationship between presences and academic motivation. Specifically, the study enlightened how psychological needs satisfaction significantly mediates the relationships between presences and autonomous academic motivation, and presences and academic amotivation, but not the relationship between presences and controlled academic motivation. It is hoped that the recommendations from the study and recommendations for future research presented above are critically reflected and acted upon by all relevant parties including academic researchers, university lecturers, and university administrations, with the ultimate goal of enhancing students' academic motivation during online learning and ensuring their academic success.

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