



Investigating the interplay between social presence, motivation, and knowledge sharing behaviour in virtual learning environment

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ARTICLE INFO

Article history:

Received 14 August 2021

Received in rev. form 20 Sep. 2021

Accepted 22 Sept 2021

Keywords:

Distance learning, knowledge management, knowledge sharing behaviour, motivation, social presence

JEL Classification:

I23, M15

ABSTRACT

This study investigates the interplay between social presence, motivation, and knowledge sharing behaviour in virtual learning environment. Sample for this research were 150 university students participated in online class sessions. A quantitative analysis was conducted by Structural Equation Modelling (SEM) with Partial Least Square (PLS) methods. The result showed that (1) there are positive effects between social presence on intrinsic motivation and knowledge sharing behaviour, (2) there is a positive effect between intrinsic motivation and knowledge sharing behaviour, (3) intrinsic motivation partially mediated the relationship between social presence and knowledge sharing behaviour, and (4) extrinsic motivation acts as predictor moderator on the relationship between social presence, intrinsic motivation, and knowledge sharing behaviour. These results implied the importance of students' motivation and social presence's perception to foster knowledge sharing in the mediated learning environment.

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Introduction

In order to create a conducive and sustain virtual learning community, many experts believe that interaction quality and continuous knowledge sharing among members as essential factors to promote better learning process (Chen, 2007; Vygotsky, 1978; Yilmaz, 2017). While encouraging student's participation would be easier in traditional face-to-face class session, different approaches may need to be applied in virtual class situation. Several barriers of online class, such as limited interaction and communication media, no physical contact, lack of other presence, and limited feedback for students opinion would drive students to become inactive in virtual class (Catyanadika & Isfianadewi, 2021; Guidera, 2003; Saltan, 2016). In order to overcome this issues, facilitator of virtual class needs to design effective methods to foster knowledge sharing activities in virtual environment.

Osterloh & Frey (2000) mentioned motivation as one trigger that able to promotes knowledge sharing in a community. Knowledge is personal asset that may difficult to freely shared without strong motives or equal consequences, especially in a competitive environment (Suppiah & Sandhu, 2011). In the working environment, members may will to share their own knowledge to other members with an expectation to gain particular rewards regarding their sharing activities. This motivation defined as extrinsic motivation, where sharing behaviour affected by goal-driven reasons (Lin, 2007; Osterloh & Frey, 2000). Whereas another motive to share may come from a perception that sharing knowledge activities are enjoyable and create a positive mood. This factor is not related with any potential reward they expect to get, but more related on the feeling of satisfaction or any altruism desire they feel from sharing his knowledge to other members. This motivation is defined as intrinsic motivation (Lin, 2007; Nguyen, 2019).

The relationships between intrinsic motivation, extrinsic motivation, and knowledge sharing behaviour have been studied by several researches in the knowledge management field. It is originally believed that human willingness to share information was driven by organizational reward. If perceived rewards equals or exceed costs to gather knowledge, they will continuously share their own

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<https://doi.org/10.20525/ijrbs.v10i6.1327>

knowledge, otherwise they will stop (Kelly & Thibaut, 1978). However, as the development of knowledge sharing theories going on, several findings concluded expected rewards are not the main reason of why people share their knowledge. Otherwise, many findings found that intrinsic motivation which originally acts as the main driver for human to share his or her knowledge (Cho, Park, & Kim, 2015; Osterloh & Frey, 2000; Zhao, Detlor, & Connelly, 2016). The development on this study leads to the relationship between both of motivations and knowledge sharing behaviour. Nguyen (2019), who found high level of variation occurred on researches regarding relationship between intrinsic motivation and knowledge sharing behaviour, identified moderating factors of extrinsic motivation on this relationship. The result concluded that actually extrinsic motivation will negatively affect relationship between intrinsic motivation and knowledge sharing behaviour. It means that rewards from sharing knowledge in a community would reduce enjoyment or satisfaction motives to share knowledge. This result is similar with other previous researches which also addressing this relationship (Osterloh & Frey, 2000; Zhao et al., 2016).

We are now narrowing the discussion in virtual learning context. While interaction among members in virtual learning community is limited, the feeling of other presence inside the community is important to foster knowledge sharing. This feeling defined as the social presence (Oh, Bailenson, & Welch, 2018; Yilmaz, 2017). Human who sense a strong social presence inside the community would think that they actually exist in the community and able to sense other members existence as well. The result of this feeling may promotes sense of belonging and importance of their existence, which would encourage members to share their knowledge in virtual environment (Kiliç Çakmak, Çebi, & Kan, 2014; Yilmaz, 2017). These results indicates that social presence, like motivation, can be acts as driving factor to promotes knowledge sharing behaviour as well, thus it can be hypothesized that extrinsic motivation, intrinsic motivation, and social presence would be crucial to promotes knowledge sharing behaviour in virtual learning community. However, present studies still lacks of findings regarding relationship between social presence and motivation in virtual learning environment.

This research attempts to identify the relationship between intrinsic motivation, extrinsic motivation, and social presence to foster knowledge sharing behaviour in virtual learning community. The effect of extrinsic motivation have been widely accepted to bring unintended consequences by many researches, which contributes to promote on the behaviour, but undermine the intrinsic motivation on sharing knowledge (Nguyen, 2019; Osterloh & Frey, 2000; Zhao et al., 2016). However, majority of findings that mentioned the impacts of extrinsic motivation on knowledge sharing activities were resulted from working environment subjects, which rewards expected are related with salary or bonuses. Whereas in learning environment, rewards are manifested in grade point rather than in monetary values, which may give different impacts. Considering different rewards and learning members' motives, the effect of extrinsic motivation may generate different results on knowledge sharing.

This research also bring social presence as another potential factors. Even though social presence has been identified to bring positive impact on knowledge sharing behaviour (Kiliç Çakmak et al., 2014; Yilmaz, 2017), still few attempts to identify effects of both motivation on the relationship between social presence and knowledge sharing behaviour. We hypothesize that social presence will promotes intrinsic motivation, as the social interaction from social presence would increasing enjoyment and satisfaction to share knowledge inside the community (Nguyen, 2019; Zhao et al., 2016). On the other hand, prior researches also found a positive result regarding the effect of extrinsic motivation on social presence and the quality of relationship among learning members. We analyse this relationship based on Chen & Chiu (2016) findings that concluded positive effects of intergroup competition to gain rewards on student engagement and learning achievement, which may indicates there are positive impacts of extrinsic motivation on the relationship between social presence and knowledge sharing behaviour. In order to improve the knowledge sharing activities on virtual learning platform, the interplay between motivation, social presence, and knowledge sharing behaviour may open a new perspective regarding the ways of online learning facilitators should construct effective learning design.

Literature Review

Theoretical and Conceptual Background

Knowledge Sharing Behaviour

Knowledge sharing behaviour defined as members behaviour to disseminate his or her own knowledge among other member in a community (Ryu, Ho, & Han, 2003). A community which all members foster sharing behaviour will promotes the continuity of knowledge sharing that potentially enrich organizational knowledge. Every member in learning community memorize and reflect their own experiences into their own tacit knowledge. This tacit knowledge should be shared to other members within the organization, in order to be internalized into community knowledge that become organization assets (Nonaka & Toyama, 2003). Knowledge sharing also support the transfer of knowledge within community and generation, as less experienced members would learn form more experience members (Ardichvili, 2008). It is believed that the development of community learning development will be depended on the knowledge sharing activities among members involved (Rosenberg, 2005).

Even though that knowledge sharing has been considered to bring positive impact to community development and learning, not all member possess willingness to share his or her knowledge to other members. Reasons of members' behaviour to share his or her knowledge have been identified from various sources. Oh et al., (2018) mentioned the readiness of platform and environment tools as one important factor, as limitation of communication peripherals may hamper members to interact with other members. Cultural factors, such as whether members are more individual or collectivist also influencing their knowledge behaviour (Ardichvili, 2008;

Hutchings & Michailova, 2004). Another factor was proposed by Osterloh & Frey (2000) is related with human motivation to share. Tacit knowledge is considered as personal asset, so individuals may think about the consequence they get for share their own knowledge (Suppiah & Sandhu, 2011). It needs triggers or motives to make someone willing to share his personal knowledge. Therefore, members' motivational reasons to share knowledge should be considered in order to enhance knowledge sharing behaviour.

In virtual environment, the process to share knowledge may face challenges in terms of community presence. While physical interaction able to bring together members in face-to-face discussion, virtual community may does not. It may reflect in members perception that their talking partners are far away or do not exist. This condition may raises transactional distance or communication gap between members involved in community (Yilmaz, 2017). In order to overcome this issue, the sense of other members' presence, defined as social presence, need to be promoted in virtual environment (Kiliç Çakmak et al., 2014). Social presence will trigger the feeling of community engagement and sense of belonging, hence able to support knowledge sharing behaviour in virtual community as well.

Social Presence

In virtual environment, sense of other members' existence may be limited by the lack of physical contact. This barrier may drive community members reluctant to share information, because they do not feel communication partners exist. In order to overcome this issue, members inside virtual community need to possess the feeling of being with another in virtual environment. This feeling defined as social presence (Lee, 2004). Social presence increase the sense of belonging of members to the community, which drive members to share his opinion, emotional expression, and continuous discussion, even though the discussion conducted without physical interaction (Oh et al., 2018).

Kiliç Çakmak et al. (2014) proposed three dimensions to measure the sense of social presence among members in virtual community. First, members in community must foster the interaction between members. It can be measured by intensity of asking and answering questions, intensity of discussion, and willingness to express own ideas inside the community (Kiliç Çakmak et al., 2014). Second dimension related with the sense of ownership, which members feel that they are belong to the virtual community (Kiliç Çakmak et al., 2014; Yilmaz, 2017). This dimension indicated by close and personal interaction style, such as greeting other members before and after class or calling each other by names or using we to mention community that indicating the group belongs to "our group". Third dimension, defined as affective statement, related with emotional sense inside the community. This can be manifested by using of emotional tools such as emoji features to express emotion, using capital letters to express surprise, anger, or happy statements, and informal communication style or humor (Kiliç Çakmak et al., 2014; Yilmaz, 2017).

The relationship between social presence and knowledge sharing behaviour have been identified by several researches, with most of results indicate positive relationship between them. For example, Zhang et al., (2015) and Yilmaz (2017) have found that social presence positively promotes knowledge sharing behaviour in social media environment. While Zhang et al. (2015) indicated that social presence can be emerged in synchronous learning platform, Yilmaz (2017) findings also concluded similar result in Facebook community, which the learning environment is more asynchronous. Both results indicate that social presence factor able to promotes knowledge sharing behaviour in various platform, whether synchronous or asynchronous. Lu, Huang, Ma, & Luce (2007) also found positive impacts of social presence on cognitive learning, learning process satisfaction, and promotes participant activities, which potentially create conducive learning environment that ensure student to express their idea comfortably (Yilmaz, 2017). This supporting environment may increasing the enjoyment and satisfaction feeling to share knowledge inside the community, thus make community members motivate to share knowledge with others (Nguyen, 2019; Zhao et al., 2016).

H1: Social presence would positively affect intrinsic motivation to share knowledge in virtual learning community

H2: Social presence would positively affect knowledge sharing behavior in virtual learning community

Intrinsic Motivation

Intrinsic motivation refers to human pleasure and enjoyment to engage in activities for its own sake and without any monetary desire (Lin, 2007). This motivation drives human to conduct action in order to pursue his or her own satisfaction for undertaken activities. Intrinsic motivation also can be related with individual pride to confirm mastery of particular performance, which act as member's recognition that he or she capable to do particular activities (Zhao et al., 2016).

Researches in knowledge sharing majorly mentioned two salient intrinsic motivation, which are self-enjoyment and self-efficacy (Lin, 2007; Nguyen, 2019; Zhao et al., 2016). Self-enjoyment related with the needs to pursue individual pleasure from knowledge sharing activities (Nguyen, 2019). Individual who regards sharing knowledge as an enjoyable activity will think that sharing is fun activity and able to fill their free time (Giannakos, Chorianopoulos, Giotopoulos, & Vlamos, 2013). Several individuals also enjoy to helping other, which by sharing his or her own experience may induce the feeling to helping other for solving problem (M. Wasko & Faraj, 2000). The enjoyment feeling to give information would make members sincerely share or interact with other members, hence, able to promotes knowledge sharing behaviour. On the other hand, self-efficacy related to human confidence to provide useful information to other person (Chen & Hung, 2010). In order to promotes knowledge sharing behaviour, community members should be confidence about their own knowledge and capabilities, thus able to foster their self-efficacy. When sharing knowledge precepted

as job-related task or duty they have to fulfil, individual with high self-efficacy tend to help other member in community by sharing useful information (Kwahk & Park, 2016). Sharing behaviour also act as a recognition, a proof that an individual able to give useful information to other members. Giving useful information to other people will be precepted as a challenge. If a member able to give useful information, his confidence will increase, and motivated to share more knowledge in community (Zhao et al., 2016).

Due to prior findings that stated positive relationship between social presence on intrinsic motivation (Nguyen, 2019; Zhao et al., 2016) and intrinsic motivation on knowledge sharing behaviour (Kwahk & Park, 2016), there also a possibility that intrinsic motivation would acts as mediator on the relationship between social presence and knowledge sharing behaviour as well. The enjoyment and high confidence level of learning participants to interact and share idea may become a significant factor of why the feel of other presence in sharing environment may promotes knowledge sharing behaviour.

H3: Intrinsic motivation would positively affect knowledge sharing behaviour in virtual learning community.

H4: Intrinsic motivation has a mediation impact between social presence and knowledge sharing behaviour in virtual learning community.

Extrinsic Motivation

While gaining knowledge needs efforts, people may expect any potential rewards would be rewarded after they share their own knowledge in a discussion. This cost-benefit driver is defined as extrinsic motivation (Lin, 2007; Nguyen, 2019). In organizational context, the expected rewards manifest in the increasing salaries, bonus, or other monetary incentives agreed on a specified contract between knowledge collectors and knowledge donators after actively participating in meeting discussion. Whereas in a class discussion, the reward may manifested in the additional score that may increase their students grade point, such as participatory point or virtual point for online class context (Zhao et al., 2016).

Another dimension of extrinsic motivation also related with its reciprocity factors to participate in social exchange, or any expected returns an individuals would receive in the future due to their past actions (Chen & Hung, 2010). While rewards involving cost and benefit matters that usually written in a contract, no particular contract specified for reciprocal advantages form sharing knowledge (Nguyen, 2019). Reciprocity emphasizes on any mutual benefit and future consequences from sharing communities, such as participants' salient belief when they share their own knowledge, they will get more knowledge from other participants as well (Nguyen, 2019; Zhao et al., 2016). In terms of class discussion, the reciprocity of knowledge sharing may be manifested in the student's expectation that classmates or teachers would also share their own knowledge in the future if he or she actively sharing knowledge during class session.

Similar to intrinsic motivation, extrinsic motivation, both in rewards and reciprocity, has been approved to bring positive consequences to knowledge sharing behaviour (Bock, Zmud, Kim, & Lee, 2005; Osterloh & Frey, 2000). However, several researches also found various results regarding the impact of extrinsic motivation as well. Some findings concluded the unintended effect of extrinsic motivation on the relationship between intrinsic motivation and knowledge sharing behaviour. In the high-enjoyment sharing knowledge environment, extrinsic rewards is not an important factors of sharing behaviour in the complex information system platform (Ko, Kirsch, & King, 2005). Other finding also found that the altruistic feeling of helping others by sharing knowledge may also disturbed by organizational rewards that decreasing the enjoyment feeling of sharing (Zhao et al., 2016). These findings implies that if a learning member change their motive to sharing knowledge because of any expected extrinsic rewards existed, it would negatively impact their intrinsic motives to share knowledge.

The impact of extrinsic motivation also should be analyzed in terms of relationship dynamics among member involved. The way social presence promoting sharing behaviour may also interfered by any extrinsic motivation. In a learning situation where the members are competing to get the rewards, the expected rewards would increase the competition among learning participant to get the highest rewards (Sänger & Wascher, 2011). Competition among members able to trigger more social engagement, as inside the competitive environment members will interact more to discuss about the winning strategy or involved more in activities for better score (Chen & Chiu, 2016). This indicates that a competitive designed class may also increase the feeling of engagement between members, hence bring positive driver for more knowledge sharing intention.

H5: Extrinsic motivation will weaken the relationship between intrinsic motivation and knowledge sharing behaviour in virtual learning communities

H6: Extrinsic motivation will strengthen the relationship between social presence and knowledge sharing behaviour in virtual learning communities.

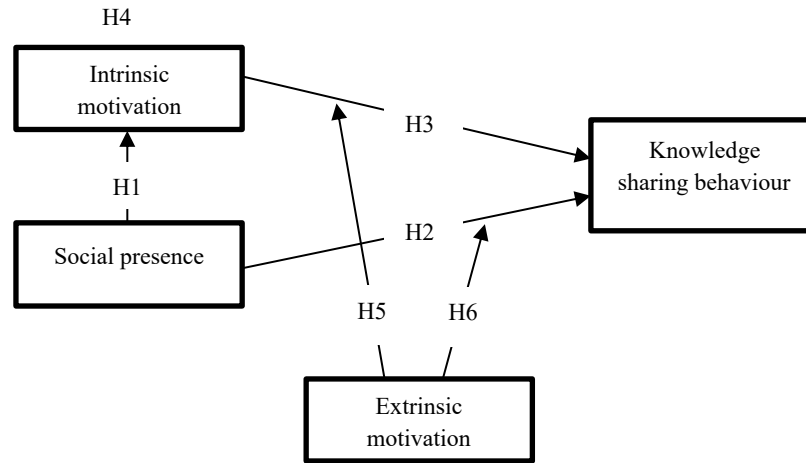


Figure 1: Research Framework

Research and Methodology

This research is conducted on a private university in Yogyakarta, Indonesia. The respondents of this research were 150 university students participated in online class sessions during Covid-19 mitigation period. The respondents were selected using convenience sampling technique to match the research’s criteria. All of the respondents’ classes are designed using online curriculum which combines both of synchronous and asynchronous learning methods. The synchronous sessions of online class used Zoom or Google Meet as the main platforms. Whereas for asynchronous sessions, the discussions are facilitated through Google Classroom and Chat Applications. Thus, the communication processes during class sessions are conducted by audio visual and written media.

The primary data are obtained by online questionnaire via email and measured using a five-point Likert Scale ranging from (1) strongly disagree into (5) strongly agree. The analysis for this research uses SEM (Structural Equation Modelling) technique using SmartPLS version 3 software. The measurements of variables are taken from previous related researches with several modification to match the virtual learning environment criteria. The measurement items and its sources are summarized on table 1.

Table 1: Structure of Instrument

Variable	Item No	Item	Sources
Knowledge Sharing Behaviour (KSB)	KSB2	Sharing information in class help me improve myself.	(Alakurt, 2013; Yilmaz, 2017)
	KSB3	I participate in knowledge sharing activities during class session	
	KSB4	I use the class period for knowledge sharing	
	KSB6	I prioritize myself to answer other students’ questions	
	KSB7	Knowledge sharing is a pleasurable experience	
Social Presence (SP)	SP1	I clearly express my ideas during class	(Kiliç Çakmak et al., 2014; Yilmaz, 2017)
	SP4	I respond to any class discussion	
	SP5	I do not hesitate to argue on class discussion	
Intrinsic Motivation (IM)	IM1	I like helping other people	(Nguyen, 2019; Wasko & Faraj, 2005)
	IM2	I feel satisfied if I can help others	
	IM3	I like to help other class participants	
	IM4	I like to help other students by answering their questions	
	IM5	I believe my answer would help other students	
Extrinsic Motivation (EM)	EM1	Obtaining participation score is important	(Nguyen, 2019; Tan, 2016)
	EM2	I expect to get participation score during class	
	EM3	Participation score mechanism motivate me to be active	
	EM4	Higher participation score will increase my motivation to join the discussion	
	EM5	I try to get participation score by answering class questions	

Findings

Respondent Characteristics

In this study a total of 150 respondents have been selected using convenience sampling technique. All of the respondents were university students which at least experienced a one year of full virtual learning program, which all of the class sessions conducted in virtual platforms. The curricula of the class also designed specifically for online learning purposes. The composition of male respondent and female respondent were rather balanced (77 of male respondents and 73 of female respondents). All of the respondents are participated in virtual classes, with various platform being used. Majority of respondents use various platform for online learning, such as videoconferencing platform (145 respondents), Google Classroom (129 respondents), and chat applications (62 respondents). These results implied that virtual learning in this research combine both of synchronous (videoconferencing) and asynchronous (Google Classroom and chat application) platform. Due to Covid-19 mitigation period, no respondents accessed or gathered class at the campus, therefore no physical interaction happened during data gathering period. Majority of respondents accessed the class from their own home (137 respondents), while several respondents also enable to join the class from public hotspots (17 respondents) and student dormitories (16 respondents). Table 2 summarized the profile of respondents gathered for this research.

Table 2: Profile of Respondents

Category	Item	N	%
Gender	Male	77	51.33%
	Female	73	48.67%
Application used for online class	Videoconferencing	145	96.67%
	Google Classroom	129	86.00%
	Chat Applications	62	41.33%
	Social Media	12	8.00%
	Other Applications	11	7.33%
Places to access online classes	Home	137	91.33%
	Public Space	17	11.33%
	Dormitory	16	10.67%
	Other	29	19.33%

Outer Model Analysis

Outer model analysis was conducted in order to measure the validity and reliability of the model proposed. The validity for this research’s model was measured using two parameters. First, the loading factor value need to be greater than 0.7 in order to meet the rule of thumb of validity model (Wong, 2013). Another parameter is the square root of AVE (Average Variance Extracted) value of each construct must be greater than other constructs. Table 3 from the analysis shows that each variable is greater than 0.7 and also greater than other construct correlation values. Therefore, the model proposed for this research is valid.

Table 3. Cross Loading Factors

	EM	IM	KSB	SP
EM.1	0.807	0.364	0.439	0.415
EM.2	0.829	0.411	0.367	0.367
EM.3	0.850	0.412	0.442	0.420
EM.4	0.824	0.365	0.413	0.405
EM.5	0.832	0.470	0.477	0.496
IM.1	0.270	0.775	0.420	0.403
IM.2	0.364	0.761	0.450	0.416
IM.3	0.369	0.796	0.421	0.423
IM.4	0.451	0.794	0.489	0.508
IM.5	0.405	0.731	0.558	0.579
KSB.2	0.305	0.468	0.708	0.388
KSB.3	0.432	0.508	0.776	0.550
KSB.4	0.466	0.499	0.808	0.600
KSB.6	0.484	0.478	0.795	0.686
KSB.7	0.230	0.387	0.715	0.469
SP.1	0.411	0.479	0.638	0.834
SP.4	0.448	0.529	0.609	0.893
SP.5	0.453	0.572	0.609	0.839

In order to prove accuracy and consistency of the model, reliability measurement also have been conducted. Reliability for this research’s model was evaluated using Cronbach’s Alpha and Composite Reliability score, which both score need to be greater than

0.7 to be considered as reliable (Wong, 2013). Table 4 showed that both of Cronbach’s Alpha and Composite Reliability of each variable model are greater than 0.7. These results indicate that the proposed model is reliable for inner analysis. The AVE (Average Variance Extracted) values of each variable are greater than 0.5 also strengthen the validity and reliability of the model (Wong, 2013).

Table 4: Reliability and Validity Construct

	Cronbach's Alpha	Composite Reliability	AVE
EM	0.886	0.916	0.687
IM	0.832	0.880	0.596
KSB	0.820	0.873	0.580
SP	0.817	0.891	0.732

Inner Model Analysis

In order to determine the relationship between variables, SEM analysis was conducted using SmartPLS 3.0 software. The relationship considered as positive when the original sample (O) is greater than 0.7. Whereas the significancy of the relationship was evaluated by looking at T-Statistics which need to be greater than 1.96 and P-Values are less than 0.005 (Hair, Risher, Sarstedt, & Ringle, 2019). The analysis results are presented on table 5.

Table 5: Direct Path Analysis

	Original Sample (O)	T Statistics (O/STDEV)	P Values	Description
Social Presence -> Intrinsic Motivation	0.616	13.111	0.000	Significant
Social Presence -> Knowledge Sharing Behaviour	0.506	6.461	0.000	Significant
Intrinsic Motivation -> Knowledge Sharing Behaviour	0.230	3.223	0.001	Significant

The results in Table 4 show that there are a positive and significant relationship between social presence and intrinsic motivation (O=0.616, T Statistics=13.111, P values=0.000), social presence and knowledge sharing behaviour (O=0.506, T Statistics=6.461, P Values=0.000), and intrinsic motivation and knowledge sharing behaviour (O=0.230, T Statistics=3.223, P Values=0.001). All three hypotheses meet the condition of positive relationship (O>0.7) and significant relationship (T Statistics>1.96; P Values<0.005). These results indicated that H1, H2, and H3 hypotheses are accepted.

Analysis for H4 was conducted to identify the effect of intrinsic motivation as a mediator in the relationship between social presence and knowledge sharing behaviour. The indirect effect was analysed using SEM modelling, and the result is presented on Table 6.

Table 6: Mediation Analysis

	Original Sample (O)	T Statistics (O/STDEV)	P Values	Description
Social Presence -> Intrinsic Motivation -> Knowledge Sharing Behaviour	0.142	3.172	0.002	Partial Mediator

Result in Table 5 shows a positive and significant relationship between social presence and knowledge sharing behaviour which mediated by intrinsic motivation (O=0.142, T Statistics=3.172, P Values=0.002). However, the original sample (O) of the relationship before and after the mediation effect is decreased from O=0.506 to O=0.142. This result indicates that by the mediation of intrinsic motivation, social presence only positively influence knowledge sharing behaviour by 14.2%, while the other 85.8% may come from other variables. The analysis also shows that with or without the mediation of intrinsic motivation, the relationship of social presence and knowledge sharing behaviour is significant (P Values=0.002 and P Values=0.000).

The results above indicate that intrinsic motivation partially act as a mediator in the relationship between social presence and knowledge sharing behaviour, which conclude that H4 also accepted.

The final analysis of this research was focus on the effect of extrinsic motivation as a moderation variable for the relationship between social presence, intrinsic motivation, and knowledge sharing behaviour. The analysis which compared the relationship of extrinsic motivation and social presence and two moderated effects addressed in H5 and H6. The result is presented on Table 7.

Table 7: Moderation Analysis

	Original Sample (O)	T Statistics ((O/STDEV))	P Values	Description
Extrinsic Motivation X Intrinsic Motivation -> Knowledge Sharing Behaviour (ME1)	-0.027	0.431	0.667	Predictor Moderator
Extrinsic Motivation X Social Presence -> Knowledge Sharing Behaviour (ME2)	0.004	0.047	0.962	Predictor Moderator
Extrinsic Motivation -> Knowledge Sharing Behaviour (Z)	0.139	2.077	0.038	Significant

Relationship between extrinsic motivation and knowledge sharing behaviour is measured to determine (Z) value for moderation comparison. The analysis resulted a positive and significant relationship between extrinsic motivation and knowledge sharing behaviour (O=0.139, T Statistics=2.077, P Values=0.038). This result then compared by values outcome from the role of extrinsic motivation as moderator variables (ME1 and ME2). The results show that extrinsic motivation is not significant as a moderator for the relationship between intrinsic motivation and knowledge sharing behaviour (P=0.667), and between social presence and knowledge sharing behaviour (P=962). While P Values of (Z) shows a significant relationship, the P Values of (ME1) and (ME2) generate the opposite result. The output of analysis proof that extrinsic motivation act as a predictor moderator, where (Z) is significant and both of moderating effect (ME1 and ME2) are not significant (Sharma, Durand, & Gur-Arie, 1981). This result indicates extrinsic motivation act as a predictor or independent variable rather than a moderator variable for knowledge sharing behaviour. This result also concluded that both of H5 and H6 are not accepted.

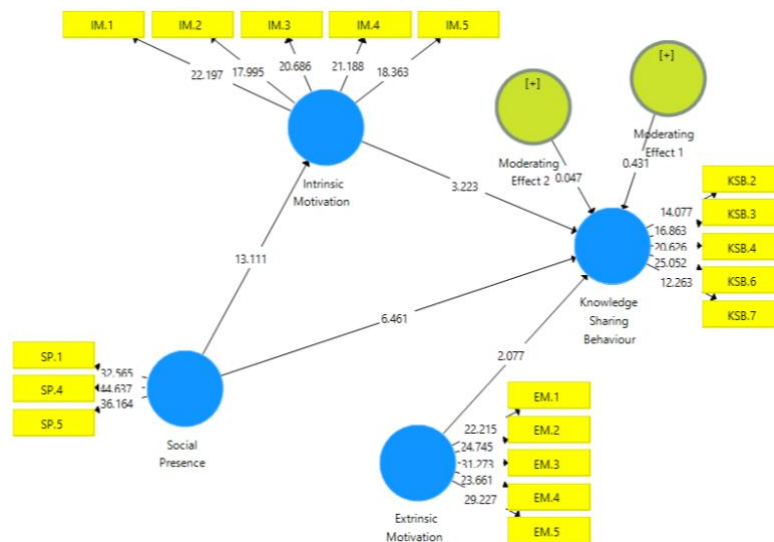


Figure 2: Structural Model

Discussions

Social Presence on Intrinsic Motivation

This study proof that social presence perception gives a positive and significant effect on the intrinsic motivation. This result underline the importance of other presence feeling in order to create a pleasant and joyful environment for sharing knowledge. Virtual learning environment have been criticized by several findings to limit the interaction among members, thus potentially create communication error and demotivate learning participants to be active in discussion (Catyanadika & Isfianadewi, 2021; Guidera, 2003; Saltan, 2016). In order to overcome communication barriers, class facilitators should build a conducive learning environment to promote interaction among learning participants, where interaction and discussion can be held effectively without direct face-to-face interaction. Thus, learning participants can enjoy the knowledge sharing process and increasing the motivation to share knowledge during class session.

Result of this study is in line with prior findings that concluded the importance of social presence to construct intrinsic motivation in the online communities, such as Huang's (2017) findings that emphasize the presence of the others as the most important factors to influence the enjoyment collaboration among CMC (computer mediated communication) users. Another finding also found similar result in Facebook environment, which point out that the awareness of friend's presence is the main reason of why Facebook users intent to interact with other users on Facebook (Cheung, Chiu, & Lee, 2011). The intention to join discussion in social media such Facebook is significantly influenced by the awareness of other users' existence inside the platform.

Social Presence on Knowledge Sharing Behaviour

A positive and significant impact of social presence on knowledge sharing behaviour determined by this study is strengthen the roles of community engagement in virtual learning stated by prior findings. When a learning member feel that other participant exists in an online platform, more discussion and interaction would be initiated by members. The key of learning effectiveness may rely on whether the platform able to provide features that facilitate more complex interaction, or whether the facilitators able to create a joyful environment where learning participant feel the presence of other members even though the class is conducted in limited virtual platform without face-to-face interaction.

This result is congruent with prior findings related with the roles of social presence for knowledge sharing. Research by Yilmaz (2017) found that social presence would promote knowledge sharing in social media platform, as social presence would ease the adaptation process, increasing satisfaction of learning activities, and also support the cognition of learning participant. Social presence also able to strengthen students' ownership to the environment, as feeling of presence would generates a positive and meaningful community. This condition is understood to bring more positive discussion feedback among participants and facilitators (Rovai, 2007).

Intrinsic Motivation on Knowledge Sharing Behaviour

Result implied that intrinsic motivation from virtual learning participants to share knowledge would bring positive impact on members' knowledge sharing behaviour. Learning participants need drivers or motives to actively participate in class discussion. Moreover, the interaction limit of virtual learning platform may decrease the intention to actively participate in class discussion. This research took focus on any joyful feeling that potentially drive learning participant to share, which can be manifested in the enjoyment of sharing activities or the confidence of the participants of their own sharing materials (C. J. Chen & Hung, 2010; Giannakos et al., 2013). This result shows that building enjoyment and increasing the confidence level of learning participant are important to promote more effective virtual class discussion.

This result supported previous findings that also found a positive impact of intrinsic motivation and knowledge sharing behaviour. Intrinsic motivation has been majorly approved to bring many positive impacts to promote sharing behaviour. Among them is a research by Nguyen (2019) which emphasized the sharing behaviour as a voluntary behaviour in learning environment. Learning participants would not trigger to share if they do not have any intrinsic intention. Another finding also proof the importance of self-enjoyment when sharing knowledge (Giannakos et al., 2013) and self-efficacy (Bock et al., 2005) would also give positive impact for sharing behaviour. As this research also emphasize on intrinsic factors in terms of self-enjoyment and self-efficacy, this research also strengthens both of prior findings.

Intrinsic Motivation Mediated the Relationship between Social Presence and Knowledge Sharing Behaviour

This research tried to develop an interplay between social presence, intrinsic motivation, and knowledge sharing behaviour. Given that prior findings concluded a positive relationship between social presence and intrinsic motivation (Huang, 2017), intrinsic motivation and knowledge sharing behaviour (Nguyen, 2019), and social presence and knowledge sharing behaviour (Yilmaz, 2017), there is also a possibility that intrinsic motivation would act as a mediator between social presence and knowledge sharing behaviour. We assumed that enjoyment and confidence feeling to share knowledge should be existed to support the community engagement and sharing knowledge activities inside the community.

The result shows that intrinsic motivation partially mediated the relationship between social presence and knowledge sharing behaviour, as both of direct and indirect effect shows significant result. The impact of social presence mediated by intrinsic motivation only resulted for 14.2%, which implied that many other factors may also influence knowledge sharing behaviour. These findings open a discussion to develop the relationship of social presence and knowledge sharing to be evaluated using other factors that may strengthen the relationship in future researches.

Moderation Effects of Extrinsic Motivation on Knowledge Sharing Behaviour

Several prior researches concluded various results regarding the roles of extrinsic motivation, intrinsic motivation, and knowledge sharing behaviour. Osterloh & Frey (2000) found that extrinsic motivation would give positive impact on knowledge sharing behaviour. This finding has been supported by Bock et al. (2005) which provided similar result. However, extrinsic motivation also able to weaken the intrinsic motivation, as any potential rewards may undermine the joyful feeling to sharing knowledge (Nguyen, 2019; Zhao et al., 2016). These findings become a basis for this research to examine the moderation effect of extrinsic behaviour in the relationship between intrinsic motivation and knowledge sharing behaviour.

Result from this research provided new findings that extrinsic motivation rather acts as a predictor rather than a moderator. Partially, this finding support studies that concluded a positive direct relationship between extrinsic motivation and knowledge sharing behaviour (Bock et al., 2005; Osterloh & Frey, 2000). However, the analysis did not able to proof the role of extrinsic motivation as a moderator between intrinsic motivation and knowledge sharing behaviour. One possible assumption for this result is that extrinsic rewards proposed in class session may be too weak to motivate the students, as majority of reward is manifested in grade point rather than monetary rewards. Another explanation may also can be identified by elaborating the element relationship of intrinsic and extrinsic motivation. Finding of Nguyen (2019) studies stated that only self-enjoyment factor that undermined by extrinsic

motivation, while the self-efficacy factor did not moderated by extrinsic motivation. This finding implied that extrinsic rewards did not affect the high-confidence of student to share knowledge.

This research also propose that extrinsic motivation would strengthen the relationship between social presence and knowledge sharing behaviour. The literature review of this study did not able to find prior findings that proposed this model. This study come up with the ideas of competition as a basis to develop this hypothesis. Extrinsic motivation manifested in rewards may potentially increase the competition among learning participants because of the participants intention to get highest rewards (Sänger & Wascher, 2011). While competition also proofed to bring more interaction and engagement inside virtual community, thus potentially strengthen the impact of social presence to promote knowledge sharing behaviour (Chen & Chiu, 2016). On the contrary, result of this study verified the opposite result as no moderation effect exist in this relationship.

The result potentially caused by the rewards provided in class still not enough to build competitive environment inside the learning community. This research taken on less competitive online class, as the grade points are rewarded in summarized scoring system rather than a normal distribution scoring system. In order to get a good grade, student only need to get good scores for all exams and homework, without attempting to get the better score rather than their classmates. Even though that a competition can be occurred in terms of “be the most active students during discussions” to get participation score, in fact, the discussion session is quite long for almost 2 hours per session. This duration gives all students ample times to express their opinion, so no need to fight for sharing time. This hypothesis may generate different result in rather competitive learning environment.

Conclusions

Implementation of virtual class frequently hampered by communication and interaction barriers due to the absence of physical interaction among participants involved. Many attempts have been initiated to identify potential solution to overcome those challenges in order to build better online environment to share knowledge. Results gained from this research provided a deeper insight to address this designated issue. This study tried to address both of motivation and social presence as the main focus to promotes knowledge sharing behaviour in virtual learning environment.

Results of this research found positive relationships of intrinsic motivation, extrinsic motivation, and social presence to promote knowledge sharing behaviour. These findings implied that motivated learning participants in class discussion is important to build an effective sharing environment, thus facilitators need to initiate methods to improve motivation among participants. Motivation building attempts can be built in intrinsic perspectives, such as by creating an enjoyment sharing atmosphere and increasing the confidence level of participant to giving opinion, or rather extrinsic perspective, by initiating a more competitive rewards that able to motivate students to get the highest rewards. Besides, due to the absence of physical interaction, facilitators need to build an environment where learning participant able to feel the presence of other participants. It potentially creates community engagement to trigger more intense discussion. This study also identified intervening effect of intrinsic motivation and extrinsic motivation for knowledge sharing activities. A positive mediation effect of intrinsic motivation confirmed the importance of enjoyment and confidence feeling to share knowledge in the mediated learning environment. Whereas no moderation effect generated from extrinsic motivation open a discussion about the importance of competitive environment to be implemented in online class.

Several notes for future discussion also need to be considered due to limitations of this research. This research was conducted in less competitive learning environment which the rewards provided for students maybe too weak to motivate students. Conducting similar study in a competitive learning environment may generate different result, as many studies believe the extrinsic motivation and community engagement would arise a competitive environment. It may also necessary to identify competitive factors in the interplay between intrinsic motivation, extrinsic motivation, social presence, and knowledge sharing behaviour in order to identify whether online learning environment should be competitive such as in online gaming community. Another limitation that may need to be consider is this research only conducted in one higher education institution. The proposed theory may need to be identified in broader research objects with various virtual learning design in order to capture boarder perspective regarding behaviour in virtual learning communities. Last, it is also necessary to develop this research model by adding more factors that potentially affecting knowledge sharing behaviour, such as participants' adoption to technology, various features in learning platforms that possibly affect the communication process, and cultural factors of online interaction.

References

- Alakurt, T. (2013). *An analysis of the factors influencing knowledge sharing behaviours between members of virtual communities of practice*. Ankara University.
- Ardichvili, A. (2008). Learning and Knowledge Sharing in Virtual Communities of Practice: Motivators, Barriers, and Enablers. *Advances in Developing Human Resources*, 10(4), 541–554. <https://doi.org/10.1177/1523422308319536>
- Bock, G.-W., Zmud, R. W., Kim, Y.-G., & Lee, J.-N. (2005). Behavioral Intention Formation in knowledge Sharing: Examining The Roles of Extrinsic Motivators, Social-Psychological Forces, nad Organizational Climate. *MIS Quarterly*, 37(1), 149–137. Retrieved from http://ftp.misq.org/skin/frontend/default/misq/pdf/appendices/2013/V37I1_Appendices/WangTaiGroverAppendices.pdf

- Catyanadika, P. E., & Isfianadewi, D. (2021). Development of Risk Breakdown Structure for Online Learning Project during COVID-19 Crisis. *International Journal of Research in Business and Social Science* (2147- 4478).
<https://doi.org/10.20525/ijrbs.v10i1.1001>
- Chen, C. H., & Chiu, C. H. (2016). Employing intergroup competition in multitouch design-based learning to foster student engagement, learning achievement, and creativity. In *Computers and Education* (Vol. 103).
<https://doi.org/10.1016/j.compedu.2016.09.007>
- Chen, C. J., & Hung, S. W. (2010). To give or to receive? Factors influencing members' knowledge sharing and community promotion in professional virtual communities. *Information and Management*, 47(4), 226–236.
<https://doi.org/10.1016/j.im.2010.03.001>
- Chen, I. Y. L. (2007). The factors influencing members' continuance intentions in professional virtual communities - A longitudinal study. *Journal of Information Science*, 33(4), 451–467. <https://doi.org/10.1177/0165551506075323>
- Cheung, C. M. K., Chiu, P. Y., & Lee, M. K. O. (2011). Online social networks: Why do students use facebook? *Computers in Human Behavior*, 27(4), 1337–1343. <https://doi.org/10.1016/j.chb.2010.07.028>
- Cho, I., Park, H., & Kim, J. K. (2015). The relationship between motivation and information sharing about products and services on Facebook. *Behaviour and Information Technology*, 34(9), 858–868. <https://doi.org/10.1080/0144929X.2014.988177>
- Giannakos, M. N., Chorianopoulos, K., Giotopoulos, K., & Vlamos, P. (2013). Using Facebook out of habit. *Behaviour and Information Technology*, 32(6), 594–602. <https://doi.org/10.1080/0144929X.2012.659218>
- Guidera, S. G. (2003). Perceptions of the Effectiveness of Online Instruction in Terms of the Seven Principles of Effective Undergraduate Education. *Journal of Educational Technology Systems*, 32(2–3), 139–178. <https://doi.org/10.2190/k148-9eda-b842-u3pa>
- Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, 31(1), 2–24. <https://doi.org/10.1108/EBR-11-2018-0203>
- Huang, Y. M. (2017). Exploring students' acceptance of team messaging services: The roles of social presence and motivation. *British Journal of Educational Technology*, 48(4), 1047–1061. <https://doi.org/10.1111/bjet.12468>
- Hutchings, K., & Michailova, S. (2004). Facilitating knowledge sharing in Russian and Chinese subsidiaries: The role of personal networks and group membership. *Journal of Knowledge Management*, 8(2), 84–94.
<https://doi.org/10.1108/13673270410529136>
- Kelly, H. ., & Thibaut, J. W. (1978). *Interpersonal Relationships: a Theory of Interdependence*. New York: Wiley.
- Kiliç Çakmak, E., Çebi, A., & Kan, A. (2014). Developing a “social presence scale” for e- learning environments. *Educational Sciences: Theory and Practice*, 14(2), 764–768. <https://doi.org/10.12738/estp.2014.2.1847>
- Ko, D. G., Kirsch, L. J., & King, W. R. (2005). Antecedents of knowledge transfer from consultants to clients in enterprise system implementations. *MIS Quarterly: Management Information Systems*, 29(1), 59–85. <https://doi.org/10.2307/25148668>
- Kwahk, K. Y., & Park, D. H. (2016). The effects of network sharing on knowledge-sharing activities and job performance in enterprise social media environments. *Computers in Human Behavior*, 55, 826–839.
<https://doi.org/10.1016/j.chb.2015.09.044>
- Lee, K. M. (2004). Presence, Explicated. *Communication Theory*, 14(1), 27–50.
- Lin, H. F. (2007). Effects of extrinsic and intrinsic motivation on employee knowledge sharing intentions. *Journal of Information Science*, 33(2), 135–149. <https://doi.org/10.1177/0165551506068174>
- Lu, Y., Huang, W., Ma, H., & Luce, T. (2007). Interaction and social presence in technology-mediated learning: A partial least squares model. *2007 International Conference on Wireless Communications, Networking and Mobile Computing, WiCOM 2007*, (1994), 4406–4409. <https://doi.org/10.1109/WICOM.2007.1088>
- Nguyen, T. M. (2019). Do extrinsic motivation and organisational culture additively strengthen intrinsic motivation in online knowledge sharing?: An empirical study. *VINE Journal of Information and Knowledge Management Systems*, 50(1), 75–93. <https://doi.org/10.1108/VJKMS-02-2019-0019>
- Nonaka, I., & Toyama, R. (2003). The knowledge-creating theory revisited: knowledge creation as a synthesizing process. *Knowledge Management Research & Practice*, 1(1), 2–10. <https://doi.org/10.1057/palgrave.kmrp.8500001>
- Oh, C. S., Bailenson, J. N., & Welch, G. F. (2018). A systematic review of social presence: Definition, antecedents, and implications. *Frontiers Robotics AI*, 5(OCT), 1–35. <https://doi.org/10.3389/frobt.2018.00114>
- Osterloh, M., & Frey, B. S. (2000). Motivation, Knowledge Transfer, and Organizational Forms. *Organization Science*, 11(5), 538–550. <https://doi.org/10.1287/orsc.11.5.538.15204>
- Rosenberg, M. J. (2005). *Beyond e-learning: Approaches and technologies to enhance organizational knowledge, learning, and performance*. John Wiley & Sons.
- Rovai, A. P. (2007). Facilitating online discussions effectively. *Internet and Higher Education*, 10(1), 77–88.
<https://doi.org/10.1016/j.iheduc.2006.10.001>
- Ryu, S., Ho, S. H., & Han, I. (2003). Knowledge sharing behavior of physicians in hospitals. *Expert Systems with Applications*, 25(1), 113–122. [https://doi.org/10.1016/S0957-4174\(03\)00011-3](https://doi.org/10.1016/S0957-4174(03)00011-3)
- Saltan, F. (2016). Blended Learning Experience of Students Participating Pedagogical Formation Program: Advantages and Limitation of Blended Education. *International Journal of Higher Education*, 6(1), 63.
<https://doi.org/10.5430/ijhe.v6n1p63>

- Sänger, J., & Wascher, E. (2011). The influence of extrinsic motivation on competition-based selection. *Behavioural Brain Research*, 224(1), 58–64. <https://doi.org/10.1016/j.bbr.2011.05.015>
- Sharma, S., Durand, R. M., & Gur-Arie, O. (1981). Identification and Analysis of Moderator Variables. *Journal of Marketing Research*, 18(3), 291. <https://doi.org/10.2307/3150970>
- Suppiah, V., & Sandhu, M. S. (2011). Organisational culture's influence on tacit knowledge-sharing behaviour. *Journal of Knowledge Management*, 15(3), 462–477. <https://doi.org/10.1108/13673271111137439>
- Tan, C. N. L. (2016). Enhancing knowledge sharing and research collaboration among academics: the role of knowledge management. *Higher Education*, 71(4), 525–556. <https://doi.org/10.1007/s10734-015-9922-6>
- Vygotsky, L. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.
- Wasko, M., & Faraj, S. (2000). "It is what one does": Why people participate and help others in electronic communities of practice. *Journal of Strategic Information Systems*, 9(2–3), 155–173. [https://doi.org/10.1016/S0963-8687\(00\)00045-7](https://doi.org/10.1016/S0963-8687(00)00045-7)
- Wasko, M. M. L., & Faraj, S. (2005). Why should I share? Examining social capital and knowledge contribution in electronic networks of practice. *MIS Quarterly: Management Information Systems*, 29(1), 35–57. <https://doi.org/10.2307/25148667>
- Wong, K. K. K.-K. (2013). 28/05 - Partial Least Squares Structural Equation Modeling (PLS-SEM) Techniques Using SmartPLS. *Marketing Bulletin*, 24(1), 1–32. Retrieved from http://marketing-bulletin.massey.ac.nz/v24/mb_v24_t1_wong.pdf [http://www.researchgate.net/profile/Ken_Wong10/publication/268449353_Partial_Least_Squares_Structural_Equation_Modeling_\(PLS-SEM\)_Techniques_Using_SmartPLS/links/54773b1b0cf293e2da25e3f3.pdf](http://www.researchgate.net/profile/Ken_Wong10/publication/268449353_Partial_Least_Squares_Structural_Equation_Modeling_(PLS-SEM)_Techniques_Using_SmartPLS/links/54773b1b0cf293e2da25e3f3.pdf)
- Yilmaz, F. G. K. (2017). Social Presence and Transactional Distance as an Antecedent to Knowledge Sharing in Virtual Learning Communities. *Journal of Educational Computing Research*, 55(6), 844–864. <https://doi.org/10.1177/0735633116688319>
- Zhang, X., Gao, Y., Yan, X., de Pablos, P. O., Sun, Y., & Cao, X. (2015). From e-learning to social-learning: Mapping development of studies on social media-supported knowledge management. *Computers in Human Behavior*, 51, 803–811. <https://doi.org/10.1016/j.chb.2014.11.084>
- Zhao, L., Detlor, B., & Connelly, C. E. (2016). Sharing Knowledge in Social Q&A Sites: The Unintended Consequences of Extrinsic Motivation. *Journal of Management Information Systems*, 33(1), 70–100. <https://doi.org/10.1080/07421222.2016.1172459>

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