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Motivational Factors for Knowledge Sharing using Pedagogical Discussion Cases: Students, Educators, and Environmental Factors

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Abstract

This research examines the motivational factors which affect knowledge sharing among university students during the use of pedagogical discussion cases in/out of the classroom. The research identifies three factors, namely the individual level (student's prior knowledge, experience and self-efficacy), the lecturer level (lecturer's prior knowledge, experience and characteristics of trust and fairness), and the environmental level (course context and diversity in team structure). The research was conducted on undergraduate business students enrolled in one of the business management courses (n = 103) and analyzed using multiple regression, a questionnaire was administered to the students and data analysis was conducted. The results of the analysis demonstrated that the student's prior knowledge and experience, the lecturer's prior knowledge and experience, and the course context positively influenced the level of knowledge sharing. In addition, the analysis demonstrated that the student's self-efficacy, the lecturer's characteristics, and the diversity in team structure have no significant influence on knowledge sharing. The implication of the study is that lecturers need to promote the students the importance of knowledge sharing as well as understanding their subject and cultivate a positive course context and learning environment to encourage knowledge sharing among the students.

Keywords: Knowledge Sharing; Knowledge Sharing Motivation; Discussion Cases; Students; Educators; Environmental Factors

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1. Introduction

It is without any doubt that the mission of universities is to equip students with the necessary knowledge for their future careers. They focus on creating innovative techniques which help students to learn through knowledge sharing among the students as well as from educators. Despite this seemingly apparent statement, there are limitations in the current research on how actually universities fulfill their mission. While the Bloom's taxonomy and its revisions do offer guidance on the process of learning, including cognitive, emotional, and behavioral dimensions of learning, [1-3], there is somewhat more limited evidence for the role of knowledge sharing (KS) in the learning process.

This research takes place in an international university in Vietnam context. Vietnam has been experiencing rapid growth in its tertiary educational system enrolment and provision, with enrolment rates rising from about 10% in 2000 to 25% in 2013 [4]. This growth has occurred due to a rapidly expanding and advancing economy. In other words, Vietnam has undergone a rapid increase in the demand for human capital, requiring also a rapid increase in educational achievement within the population [5]. This is part of a global shift toward requirement for higher levels of education and technical skills and knowledge in the workforce, which must still be met at the local level due to limitations on the free movement of people [5]. Thus, the problem of increasing demand for human capital and knowledge is not unique to Vietnam.

Vietnam's tertiary education system does struggle under the challenges posed by a rapid increase in demand for skilled workers, due to a lack of capacity and funding [4]. Unfortunately, conditions for learning in Vietnamese universities are not always ideal, with poor working conditions and pay as well as poor training conditions [6]. A heavy reliance on international education also runs the risk of so-called brain drain, which occurs when individuals trained in international universities choose to seek employment abroad (typically because of better living and working conditions and pay) rather than return to their home country [6]. Thus, if Vietnam's classroom learning experience and knowledge transfer is not highly effective, the country will continue to face skills shortages and human capital shortages, which will prevent further economic development.

The aim of this research is to examine the effect of peers (students), educators (lecturers), and environmental characteristics on the students' motivations to share knowledge using pedagogical discussion cases. While this research supports current general theories on interpersonal knowledge sharing in universities and small-groups context, it also serves as a practical tool in curriculum development and teacher/lecturer training to enhance knowledge acquisition and integration for students working on discussion cases.

2. Knowledge and Knowledge Management (KM)

Nonaka & Peltokorpi stated that "Data can be classified as raw numbers, images, words and sounds derived from observation or measurement. Information represents data arranged in a meaningful pattern. Unlike information, knowledge is about beliefs, commitments, perspectives, intention, and action [based on this knowledge] [7]." A Piagetian perspective on knowledge holds that knowledge can be constructed through experience and interactions with others [8]. A broad definition of knowledge is useful because it is a highly complex concept that may not be shared between members of an organization or group [9].

KM is often defined as an organizational capability for leveraging its knowledge assets in order to make the organization more competitive [10]. Gold, et al. [11] further developed the organizational definition of KM by pointing to the importance of technical, cultural, and structural infrastructures that support KM within the organization. Technological infrastructures such as business intelligence systems, organizational structures intended to support KM, and cultural elements such as a culture of sharing all contribute to development of KM [11]. The technical infrastructures these researchers refer to are usually termed knowledge management systems (KMS) [12]. The development of KMS does draw on the theory of organizational knowledge management, but is a separate technical discipline [12].

Modern knowledge management (KM) stems from the research of Nonaka and Takeuchi [13] who defined KM and explained its utility for the organization based on their research in Japanese companies. The model of Nonaka and Takeuchi [13] is based on spiral of knowledge creation, which different forms of knowledge are combined, socialized, and internalized and externalized to transform knowledge and enable its use. The forms of knowledge identified by the authors include tacit knowledge (unwritten knowledge, which may not even be recognized by the

knowledge holder, and which may be passed person-to-person) and explicit knowledge (or knowledge which is written down and shared formally between others) [13]. There are various ways in which KM is conceptualized as an interpersonal process, including knowledge creation (KC), knowledge transfer (KT), knowledge sharing (KS), and knowledge barriers (KB) [14]. This research is primarily concerned with KS as an interpersonal activity within the organization.

In the context of education, a process of knowledge formation can be derived from the revised Bloom's taxonomy [2]. Bloom's taxonomy addresses expected educational outcomes from multiple learning domains, including cognitive (thought processes), affective (emotions and feelings), and psychomotor (physical skills) [15]. The revised Bloom's taxonomy expands on the original taxonomy by increasing the number of knowledge dimensions (including metacognitive knowledge) and rearranging the learning outcomes to have a rational basis, which was missing in the original design [2]. These knowledge domains are hierarchical; while factual knowledge addresses the basic facts a learner needs to know, conceptual knowledge and procedural knowledge relate to models and techniques the student needs to know to apply factual knowledge to a problem. Metacognitive knowledge can be described as knowing how one knows and how to apply knowledge [2]. The cognitive process model of the revised Bloom's taxonomy of learning includes six stages of learning, each of which imply a different level of knowledge development, understanding, and application [2]. These six stages include Remembering, Understanding, Applying, Analyzing, Evaluating, and finally Creating [2, 15]. This taxonomy can be used to structure and guide the learning process stages, including instruction process, learning process, and assessment process, ensuring that learners are assessed on the same criteria under which they learned [15].

3. Knowledge Sharing (KS)

KS can be defined as "provision of task information and know-how to help others and to collaborate with others to solve problems, develop new ideas, or implement policies or procedures [16]." KS can occur through formal documentation (knowledge capture), direct communication, or through writing [16]. KS can also be defined as a flow of information between individuals, both providing, seeking out, and receiving knowledge from others and integrate it into their own knowledge set [17].

KS cannot be assumed to be a uniform process because of differences between individuals and interpersonal relationships as well as the differences in knowledge types. All knowledge is not the same and does not have the same effects; for example, interpersonal knowledge may have different effects than procedural knowledge [18]. Furthermore, tacit and explicit knowledge are different; sharing of tacit information is highly dependent on interpersonal trust because it is often held by the individual and considered unique, while explicit knowledge can be learned elsewhere [19]. KS is also highly variable depending on individual factors such as the organizational context, interpersonal and team characteristics, cultural characteristics, individual characteristics, motivational factors, and perceptions [16].

The benefit of KS comes from the fact that individuals have different areas of knowledge and expertise; thus, sharing this knowledge could help to improve overall performance [18]. However, there are some critiques related to the conceptualization and operationalization of KS. KS does often overlap conceptually and operationally with knowledge transfer (KT), and the two concepts may be used interchangeably, which creates confusion about whether these are truly different concepts [14]. To distinguish between the two concepts, one useful differentiation is that KS is most often used to refer to the interpersonal or individual exchange of knowledge, while KT most often refers to the organizational processes of exchanging knowledge [16]. This difference is followed in the current research, which focuses on KS as an interpersonal process, dependent on individual characteristics, lecturer characteristics, and environmental factors.

This research focused on KS in student learning in the context of discussion cases. Case method is based on a long tradition of problem-based learning (PBL), which is a method of "facilitated problem solving on a complex problem that does not have a single correct answer [20]." PBL requires students to work in small collaborative groups to identify the problem and attempt to solve it using their existing and new knowledge [20, 21]. PBL was originally developed in the 1950s, and became widespread in the medical field in the 1970s as a response to poor performance of students taught primarily through rote memorization [22]. It has since been adopted in diverse fields including business, architecture, engineering, law, and other areas [22]. However, there are some limits to the

empirical evidence for the effectiveness of PBL, including limited research outside medical and K-12 gifted education and for some of the learning goals [20]. While some authors argue that there is sufficient evidence for the PBL approach [20-22], others have disagreed [23, 24]. Kirschner, et al. [23] included PBL in a set of self-directed learning (SDL) approaches that they critiqued as being generally less efficient and effective for learners than guided learning. Neville's [24] critique is based in the lack of strong evidence for the effectiveness of PBL. They did note that PBL-educated medical professionals do show more technical competency than those from traditional, memorization-based systems, but still pointed out that there is a weak empirical foundation for PBL [24]. Thus, there is a need for more evidence related to the efficacy of PBL.

There are several alternative techniques to case-based or problem-oriented classroom learning compared to PBL. One such alternative is dilemma-based assessment, which derives problems from actual work conflicts and issues experienced by early-stage graduates [25, 26]. Cooperative learning is a general approach that incorporates group work in the classroom to encourage independent learning through academic and social engagement between peers [27]. Cooperative learning seeks to develop both problem-solving skills and cooperative skills, requiring students to work together and engage with the materials [28]. Finally, work-integrated learning (WIL) is a relatively new technique of cooperative learning designed to incorporate principles of work into the student's learning experience, typically through real-world work experience like practicums, internships, or fieldwork [29]. These alternative methods are not as widespread as PBL (except potentially cooperative learning), but all of these alternatives depend on cooperation and KS between students in order to leverage individual learning and knowledge.

Cases can serve as the vehicle for teaching topics that cannot be learned through classroom lecture and memorization, such as instilling professional ethics and enforcing moral norms that are important for the profession [1]. Case study teaching helps develop student's independence and interdependence, critical thinking skills, and flexible learning and problem solving skills, all of which can be more effectively applied in professional and work-related environments [30]. Thus, cases are valuable teaching and learning tools for PBL.

KS is important because of its role in student's learning outcomes. It is an initial step in facilitating learning and application of new knowledge [14]. Previous studies have found a positive relationship between KS and key learning outcomes, including aspects like peer interaction and engagement, higher-order knowledge such as metacognition and reflection, and higher perceived learning as well as higher levels of objective performance measures in at least some cases [31-37]. The studies also demonstrated increased enjoyment of the learning process and satisfaction with the learning process, which were shown to have a positive impact on the perceived learning outcomes of the learners [32, 37]. In contrast, negative environmental conditions, such as non-productive team conflict, can prevent effective translation of KS into learning outcomes or performance outcomes [34].

One problem of research into KS in the classroom relates to what one author has termed as "technopositivism", or excessive focus on the use of technology in KS [38]. The technology of KS can either encourage or impede learning. One study noted that technological KM systems, even though they are designed to facilitate KS, could inhibit learning because they are too complex or difficult [39]. This means that students can use so much cognitive effort into learning to use the system that their targeted learning outcomes are neglected [39]. Technological intermediaries such as wikis and weblogs are perceived as didactic tools in the classroom, which can make students resistant to their use and thus reluctant to share knowledge, limiting effects on student learning outcomes [40]. Current research, both for this final relationship and elsewhere, has focused on technological intermediaries for KS, such as wikis, weblogs, content management systems (CMS) or learning management systems (LMS), podcasts, and similar tools. These tools can, as these studies show, have strong positive outcomes. However, as Cole [40] demonstrated, this could be ineffective for classroom application, preventing rather than facilitating KS and the positive learning outcomes. This research focuses on KS not just through technological intermediaries, but also in face-to-face interpersonal and small-group communication, as a means of balancing the literature and re-emphasizing the importance of these interpersonal relationships and communication, and not just the technological tools used to transfer knowledge in some cases.

There are also limitations on the epistemological understanding of KS, in particular limitations of applications of Bloom's taxonomy (either original or revised) to KS in case-based learning approaches. There are some directives or practice-based recommendations for applying Bloom's taxonomy to case-based learning. For example, Gill [41] stated that the learning objectives of the discussion cases, or other type of cases, should be established prior to writing and using the case. In addition, specific facts, conceptual knowledge, and procedural knowledge that will be

applied should be determined during the process of case development, while specific cognitive processes that are expected should also be outlined [41]. However, there is some evidence that case-based learning serves to reinforce existing learning instead of developing new knowledge [42]. These authors found little evidence of knowledge creation, instead finding that most of the students' learning outcomes reflected orthodox business models and views founded in their classroom learning [42]. Thus, there is a gap in the literature surrounding the role of KS in the formation of knowledge using Bloom's taxonomy, which this research addresses.

4. Knowledge Sharing Motivation

This research focuses on the motivational factors among small groups of students based on what motivates these students to share what they know. Motivation refers to the intrinsic drive to share knowledge with others, formed from the confluence of external and internal pressures [43]. Current research identifies several KS motivations, or reasons to engage in KS. These motivations include individual attitudes and beliefs (intrinsic motivations), such as altruism and enjoyment of sharing; learning orientation versus performance orientation; team trust and cohesiveness; emotions; positive psychology; intention for studying the course; and extrinsic motivation such as recognition and rewards [43-48]

A three-dimensional framework of factors that could influence the student's knowledge sharing intentions was derived from the works of Wang and Noe [16] and Cummings [49], both of which identified factors (environmental, individual characteristics, motivational) in KS in different settings. KS motivations are addressed different than KS behaviors, as behaviors may be inconsistent and may not be directly observable or measurable [50].

4.1 Individual student's characteristics and knowledge sharing

Initially, the research examined the relationship between individual student's characteristics and KS. Individual characteristics, personality and interpersonal interactions are commonly under-studied as factors in KS outcomes [16]. Evidence for demographics (other than education and work experience) is particularly weak [51]. However, there is some evidence for individual factors that could influence KS. [50]

First, we examined the student's prior knowledge in the course material and other positive traits. Prior knowledge of ICT systems was identified in a study [52] with Iranian oil workers, as a factor in KS behaviors (including both sharing knowledge and seeking knowledge). Other studies have also found positive evidence for the effect of prior knowledge and other personal characteristics. Kuo and Young [50] found that attitudes, subjective norms, controllability and self-efficacy influenced KS intentions, although only self-efficacy influenced behavior. These findings were similar to those of Tohidinia and Mosakhani [52]. Finally, Wang and Noe [16] found that education and work experience had commonly been studied, but factors such as personality, self-efficacy and other factors were under-examined and required additional research. Other positive traits, such as altruism, reciprocity, and enjoyment of sharing are routinely identified as factors in KS intention or behavior [43, 45, 46]. Trust is also commonly identified as a motivator for KS [43, 44, 48]. There are some limitations to personal traits and knowledge in the literature [51]. For example, studies of prior knowledge often use proxies like education level or work experience, rather than directly assessing system knowledge [51]. Furthermore, personality characteristics, impression management (face), and other personal factors have been addressed [16]. Hence, the relationship of prior knowledge to positive traits forms H1:

Hypothesis 1: The student's prior knowledge of the course materials as well as his/her positive traits positively influences student's motivation to share knowledge.

Self-efficacy relates to the individual's perception that he/she has skills and knowledge that apply in a certain area [50]. Self-efficacy is related to prior knowledge, but also is part of the individual's self-concept and understanding of his or her skills and experience [50]. Previous studies have found that self-efficacy has an influence on KS intentions and behavior, while other factors (attitudes, subjective norms, and controllability) showed significant influence on KS behavior [50]. Tohidinia and Mosakhani [52] also found that self-efficacy influenced KS intentions and activities. Wang and Noe [16], identified self-efficacy as one of the factors requiring

additional study. These studies are limited in their reach, but there is sufficient evidence for the second hypothesis to be tested in the study:

Hypothesis 2: The student's academic self-efficacy positively influences student's motivation to share knowledge.

4.2 Lecturer's characteristics and knowledge sharing

Lecturer's characteristics were selected because of the intensive role of the instructor in classroom learning and because of the role of the lecturer as a bridge between the lecturer's characteristics and their effect on student's KS motivations have not been studied very much, but the existing evidence suggests that lecturer's knowledge and feedback can influence student's motivation to partake in the course. For example, the lecturer's technical competency influences their ability to effectively integrate video into their coursework, which influences student's motivation and engagement with their coursework [53]. A third study provides information about how interactions between discussion leaders influence student's motivation [55]. This study shows there are several ways facilitators can engage with students to increase motivation and engagement, thus potentially influencing KS [55]. While this evidence is limited and there are few other supporting studies, the research will examine the following hypotheses:

Hypothesis 3: The lecturer's prior knowledge and experience of the course materials positively influences the student's motivation to share knowledge.
Hypothesis 4: The lecturer's characteristics, such as trust and fairness, positively influence the student's motivation to share knowledge.

4.3 Environmental factors and knowledge sharing

The environmental factors in the study included course context and diversity in team structure. Both factors are relatively under-explored in the literature, representing a general inconsistency in focusing on the environment's role in KS, particularly in the student's interpersonal context. Course context has been studied by few authors [32, 37] who found that aspects of the course, such as curriculum, course content, assessment type, class size, language of study, instructor support, rewards and incentives, and use of blended learning, had influence on the student's KS motivation or KS intention. Gomez, et al. [32] found that the course content's characteristics were particularly important for team learning in a blended environment, while Zhu [37] found that course content had a direct role in student's KS intentions. These studies provide support for the fifth hypothesis examined here, which is that:

Hypothesis 5: The course context positively influences student's motivation to share knowledge.

Diversity in team structure is also an area that has limited support in the literature for KS motivations and intentions to share. Cummings' [49] study of team characteristics and their role in knowledge sharing did not show that demographic diversity (including sex, age, and work experience) influenced external KS (These authors did not study inter-team or interpersonal KS). Zhu [37] found that team member interaction could influence the satisfaction with the learning process, as well as team structure. Thus, these studies do suggest that team structure and diversity could influence KS motivations or intentions, but did not prove it. This limitation maybe because of the focus on firm-based KS as an organizational activity, rather than focus on KS at the team level or in the academy. Therefore, the sixth hypothesis of the research states:

Hypothesis 6: Diversity in team structure positively influences the student's motivation to share knowledge.

The factors included in the study and the structure of the research framework is shown below (Fig. 1). These factors were examined using a quantitative survey of students enrolled in a university-level class using case-based learning in Vietnam.
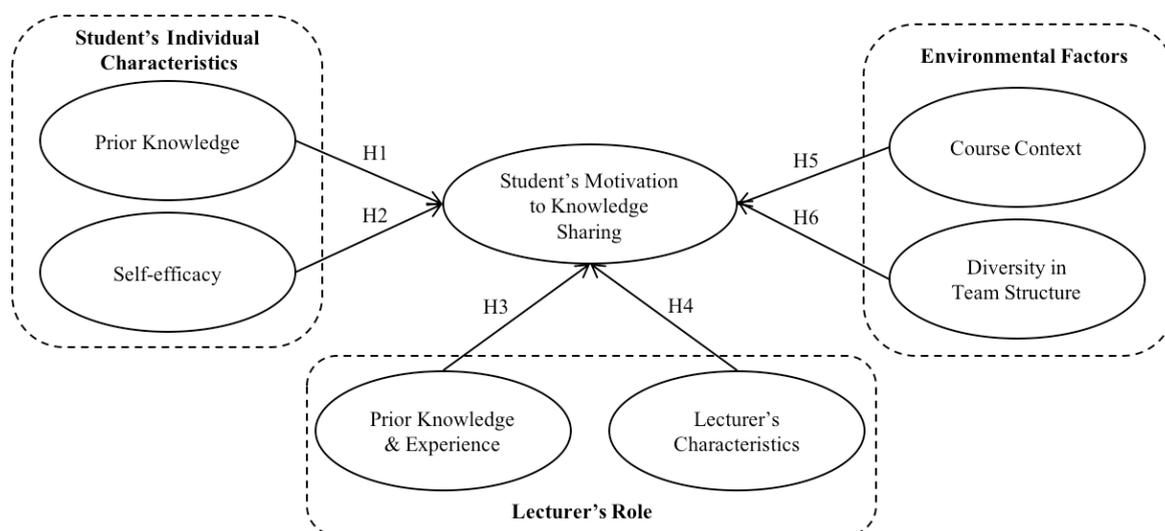
Fig. 1. Research framework

5. Methodology

The study adopted the quantitative survey-based technique to test the hypotheses. The questionnaire was developed based on widely used instruments, although some scales did require new items due to lack of previously tested measurement instruments. Items related to Course Context (CC) were derived from Frisby and Martin [56]. Diversity in Team Structure (DTS) was measured using the instrument defined by Van Dick, et al. [57]. Student's prior knowledge (SPK), personal traits, lecturer's prior knowledge/experience (LPK) were measured using a scale defined for the study. Student's self-efficacy (S) was measured using a combination of items from two scales [58, 59]. Finally, student's motivation to knowledge sharing (SM) was defined specifically for the study. A pilot test was conducted using 30 copies of the questionnaire collected (Table 1). Cronbach's alpha was used to assess the scales' internal consistency, with a minimum value of $\alpha = 0.7$ in keeping with general rules of thumb regarding descriptive and explanatory research [60]. Initial testing of scales including CC ($\alpha = 0.897$), DTS ($\alpha = 0.703$), SM ($\alpha = 0.887$), SPK ($\alpha = 0.856$), S ($\alpha = 0.950$), LPE ($\alpha = 0.706$) and LC ($\alpha = 0.865$) indicated that the scales were sufficiently reliable.

An online questionnaire was distributed to students enrolled in one of the business management courses. The course had a significant online work component, and the questionnaire was distributed as part of the weekly discussion materials.

Table 1. Cronbach's alpha and descriptive statistics from the pilot test

Constructs/Items	Min	Max	Mean	Std. Deviation
CC (Course context) Cronbach's Alpha = 0.897				
CC1	3	7	5.79	.848
CC2	3	7	5.63	.863
CC3	3	7	5.67	.821
CC4	3	7	5.79	.723
CC5	3	7	5.94	.814
CC6	4	7	5.95	1.004
CC7	4	7	5.88	.878
CC8	2	7	4.97	1.354

CC9	1	7	4.89	1.393
CC10	1	7	5.02	1.313
DTS (Diversity in team structure) Cronbach's Alpha = 0.703				
DTS1	1	6	2.85	1.511
DTS2	1	6	2.26	.816
DTS3	1	6	2.00	.686
DTS4	1	6	1.85	1.061
DTS5	1	6	3.27	1.395
DTS6	1	6	3.10	1.404
DTS7	1	6	2.76	1.264
SM (Student's motivation to knowledge sharing) Cronbach's Alpha = 0.887				
SM1	2	7	5.28	.833
SM2	2	7	4.79	1.480
SM3	2	7	4.73	1.616
SM4	3	7	5.56	.987
SM5	3	7	5.70	.790
SM6	2	7	5.77	1.012
SM7	3	7	5.94	.895
SM8	5	7	5.61	.645
SM9	5	7	5.73	.629
SM10	3	7	5.80	.797
SM11	2	7	5.17	1.537
SM12	2	7	5.00	1.421
SM13	3	7	5.65	.789
SM14	4	7	5.76	.678
SM15	3	7	5.83	.701
SM16	1	7	5.05	1.279
SM17	1	7	5.17	1.302
SM18	1	7	5.44	1.333
SM19	1	7	5.31	1.129
SM20	2	7	5.37	1.057
SM21	1	7	5.58	1.168
SM22	1	7	5.40	1.088
SM23	1	7	5.43	1.185
SM24	1	7	5.47	1.211
SPK (Prior Knowledge) Cronbach's Alpha = 0.856				
SPK1	2	7	5.30	.958
SPK2	2	7	4.77	1.496
SPK3	1	7	4.32	1.693
SPK4	1	7	4.46	1.607
SPK5	2	7	4.46	1.564
SPK6	2	7	4.16	1.235
SPK7	2	7	5.06	1.027
SPK8	1	7	5.24	1.089
S (Self-efficacy) Cronbach's Alpha = 0.950				

S1	1	6	4.91	1.121
S2	1	7	5.10	1.098
S3	1	7	5.10	1.201
S4	1	7	5.05	1.324
S5	2	7	5.11	1.267
S6	2	7	5.17	1.097
S7	2	7	5.17	1.197
S8	1	7	5.17	1.502
LPE (Prior knowledge & experience) Cronbach's Alpha = 0.706				
LPE1	4	7	5.50	.765
LPE2	3	7	5.74	.828
LC (Lecturer's characteristics) Cronbach's Alpha = 0.865				
LC1	2	7	5.21	1.499
LC2	2	7	5.11	1.455
LC3	2	7	5.55	.997

Analysis was conducted using the SPSS software. All items were aggregated into a single unweighted index variable for each of the scales. Multiple linear regression was then used to test each of the relationships, using a significance level of $p < 0.05$ (based on the t-test) to determine the significance of each of the factors. The independent variables in the regression analysis includes, environmental factors (CC and DTS), student characteristics (SPK and S), and lecturer characteristics (LC and LPE). The independent variable was SM.

A total of 150 students were involved of which 135 were returned (90% initial response rate). A total of 32 questionnaires were discarded due to non-completion, inadvertent inclusion of personal information or other faults, leaving a final sample size of n = 103 students. This represented a 68.7% response rate.

The sample was predominantly male (66%), with a smaller group of female participants (34%). The age distribution was as follows: 18 to 19 years (1.9%); 20 to 21 years (78.6%); 22 to 23 years (17.5%); and 24 years and older (1.9%). The racial identification of participants was predominantly Asian (99%), with one Hispanic participant. Most students were from Vietnam (94.2%). The participants had a range of majors, most within business. The largest groups were enrolled in the Bachelor of Commerce program (21.4%), Bachelor of Business (Management) program (20.4%), or Bachelor of Business (Marketing) (12.6%).

6. Results and Discussion

The research's results are summarized in Table 2. The goodness of fit of the regression was moderate (R^2 = 0.533). This means that 53.3% of the variance in SM was caused by variance in the predictor variables tested. Each of the variables was assessed using the t-test outcomes to determine significance ($p < 0.05$). Variables including SPK ($p = 0.023$), LPK ($p = 0.046$), and CC ($p = 0.000$) were significant. On the other hand, three other variables, including S (0.347), LC (0.301), and DTS (0.486), were not significant. The strongest significant factor based on the standardized coefficients was CC ($\beta = 0.473$), followed by LPK ($\beta = 0.170$) and SPK ($\beta = 0.189$). In contrast, the effects of the non-significant variables were relatively weak, including LC ($\beta = 0.101$), S ($\beta = 0.074$), and DTS ($\beta = 0.054$).

Table 2. Summary of hypotheses results

Relationship between variables	Hypothesis	B	β	t-value	p-value	R^2	Result
Student's prior knowledge (SPK) and student's motivation to knowledge sharing	H1	.115	.189	2.302	.023	.533	Supported
Self-efficacy (S) and student's motivation to knowledge sharing	H2	.033	.074	.945	.347		Rejected

Lecturer's prior knowledge (LPK) & experience and student's motivation to knowledge sharing	H3	.147	.170	2.019	.046	Supported
Lecturer's characteristics (LC) and student's motivation to knowledge sharing	H4	.050	.101	1.041	.301	Rejected
Course context (CC) and student's motivation to knowledge sharing	H5	.372	.473	5.244	.000	Supported
Diversity in team structure (DTS) and student's motivation to knowledge sharing	H6	.044	.054	.699	.486	Rejected

6.1 Effects of individual, lecturer and environmental factors on KS in case-based learning

One of the most important implications of this research is the identification of a novel significant factors in KS motivations in a case-based context. Although not all the factors identified in the research were supported during the data analysis, we still strongly believe that those that were supported would add to the current literature and form the basis for further research. Those that were not supported could be investigated in future research in order to achieve a solid conclusion.

This research demonstrated that there are three significant factors in student's KS motivation, including student's prior knowledge and individual characteristics, lecturer's prior knowledge and experience, and the course context. The insignificant factors included lecturer's characteristics (trust and fairness), student's self-efficacy, and diversity in team structure.

The evidence for the student's prior knowledge and individual characteristics was consistent with existing literature, which has broadly indicated that students are more likely to share knowledge if they have prior knowledge and experience or personal characteristics like altruism, trust, and positive attitudes to KS [16, 43-46, 48, 50-52]. Of all the factors tested, the role of individual characteristics was perhaps the most supported and certain, although Wang and Noe [16] suggested that there are still uncertainties and gaps in our understanding in this area. At the same time, the student's self-efficacy was not supported, despite it being commonly found to play a role in KS motivation and intention [16, 50, 52]. These findings demonstrate the literature is lack of focus on individual factors in KS intention. For example, it is possible that broader environmental influences such as organizational or national culture could influence individual's sharing motivation [61], which may even override the importance of self-efficacy as a sharing strategy. Similarly, the lecturer's prior knowledge and skills were significant in KS motivation, while lecturer's characteristics (trust and fairness) were found not to be significant. This is consistent with the role of the lecturer in PBL, which encourages student-led learning rather than lecturer-focused learning [20, 21]. However, there are also several other ways teachers can motivate students in the learning process [54, 55]. It is possible that the lack of instructor's trust and perceived fairness occurred because of the emphasis on the internal group structure and reliance on other students rather than the instructor for support, which is common with PBL and related group learning techniques [20, 21]. However, because the lecturer's knowledge and skills are evident in the design of the course content, these elements of the lecturer's presence in the classroom may be of more relevance.

Finally, the course content was significant in KS motivation, but diversity in team structure was not. These findings are broadly consistent with the rest of the somewhat limited research into the course itself and its role in facilitating KS. Few studies have demonstrated positive effects of the course content and structure on KS motivations or intentions [32, 37]. At the same time, studies that addressed team structure generally did not show significant effects [37, 49]. It is also worth considering that the overall demographic characteristics of the sample indicate that there may have been little team diversity to influence KS intentions in the first place. Thus, if this study were conducted in a more diverse student population the results may be somewhat changed, due to increased diversity and the potential for increased friction along with it.

6.2 General issues of KS in case-based learning

This research raises a general issue on the role of KS in case-based learning. One of the possible problems of case-based learning approaches is that the cases serve to reinforce existing knowledge, rather than create and share new knowledge [42]. The findings of this study, which demonstrate that student's prior knowledge, rather than self-

efficacy, is a motivational factor for KS, would seem to strongly support this possibility. Specifically, if students are more willing to share knowledge depending on what they already know, this could mean that they are less likely to seek out or offering knowledge as a means of improving their knowledge. This research did not conduct a full personality and motivational assessment for KS motivation, which would have included aspects such as personality characteristics, impression management, and other extrinsic motivational factors [16]. However, the findings do suggest that extrinsic motivations could be playing a role in the motivation to share knowledge. This is an aspect of KS that continues to require additional research, in keeping with Wang and Noe's (2010) observation.

Another more general question of this research is what role KS plays in case-based learning when considered from the perspective of Bloom's taxonomy. The revised Bloom's taxonomy identifies a sub-process of Explaining in the stage of Understanding, which is a relatively early stage in the process of knowledge creation [2]. However, it is possible that KS could occur at an earlier stage (for example, in the summarizing stage, which occurs earlier in understanding) or at a later stage (for example, sharing knowledge as part of the process of analysis or application of knowledge). This problem in categorization of KS as a sub-process of knowledge generation points to a problem of Bloom's taxonomy, which is that it conceptualizes knowledge creation as an essentially individual, internal process of incorporating and transforming external inputs. In contrast, case-based learning depends on a model of learning that positions it as a networked process, in which interactions with other learners is an essential part of the creation of knowledge.

7. Limitations and Future Work

This research was limited both methodologically and theoretically due to the small sample size (n=103) of the students enrolled in the subject. However, it did have some impact on the type of analytical tools that could be used. This also has affected the number of individual's characteristics involved in the analysis. For example, the research did not incorporate personality attributes or detailed attitudes toward KS. This was due to limitations on the amount of course duration (one semester) that could be used for the research. These limitations offer an opportunity for further research into the factors in KS motivation in case-based learning processes (including but not limited to the PBL approach incorporated in the subject course). The findings also offer more opportunities for research and theorization. One of these opportunities is the modification of Bloom's taxonomy or creation of an alternative process-oriented model of learning which uses an interactionist view of knowledge creation. This perspective would not consider knowledge creation as an individual, internal process, but instead as a process that takes place between individuals, based on their interaction and sharing of existing knowledge.

8. Conclusion

This study investigated the effects of some factors in KS on students' learning in the context of a case-based learning process at an international university classroom setting. The results showed that the student's prior knowledge, the lecturer's know-how, and the course context were significant positive factors to student's motivation to share their knowledge. Some of these findings could be due to the nature of the course and materials. For example, the sample showed high homogeneity, which could limit the effect of diversity. Furthermore, the nature of case-based learning using the PBL approach is that the main classroom interactions are actually with other students, rather than lecturers, which could limit the effect of lecturer's personal characteristics on the KS motivation during the case analysis process. The most surprising finding was related to the lack of significance of self-efficacy, which has been found to be significant in KS motivation and intention in several other studies. There is no clear explanation for this difference, although it could be related to the measurement of self-efficacy or cultural factors.

The main implication of this study for lecturers at the university level that are using a PBL approach with case-based learning would be that they should encourage students to examine their existing knowledge and to share it. In most case-based learning activities, students are not only drawing on knowledge and skills learned in the class, but are drawing on a body of knowledge they have gained previously. Since these previous experiences are likely to vary more widely than immediate knowledge from the class, it would be highly beneficial for knowledge creation for students to share their previous knowledge with classmates, helping to expand knowledge and transform tacit to explicit knowledge.

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