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Turning lurkers into innovation agents: An interactionist perspective of self-determinant theory

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ABSTRACT

Despite the general negative conception about lurkers in online knowledge-sharing practices, there is a growing body of literature that suggests the bright side of lurking behavior, termed as active lurking. Building upon the self-determination theory, this research aims to examine the individual and organizational aspects that may influence individual employee's motivation to engage in active lurking behaviors. In a study of 200 employees in the banking sector, we demonstrate support for the relationships among perceived importance of knowledge, perceived negative reputation influence, active lurking behavior, knowledge collecting and individual innovative capability in both public and private companies. We also find that organizational culture plays an important role as moderating variable. This research adds to the knowledge sharing literature by showing that the interaction between individual and organizational aspects can turn lurkers into active participants in organizational online knowledge sharing and increase their innovative capability.

1. Introduction

Organizations have increasingly placed greater emphasis on online knowledge sharing (OKS) as a primary means to leverage their most valuable assets - employee knowledge (Charband & Navimipour, 2016; Nguyen, et al., 2019; Nguyen, et al., 2020; Li et al., 2021). One area of increasing interest is the role that lurkers play in OKS, who accounts for up to 90% of OKS participants (Nguyen & Malik, 2021; Walker et al., 2013). Unlike knowledge posters, who actively share knowledge in online communities, lurkers read the knowledge shared but rarely share knowledge themselves (Marett & Joshi, 2009). The extant literature has provided ample evidence that lurkers are necessary and beneficial for OKS communities and organizations in several ways, such as applying the obtained knowledge to their job (Nguyen, et al., 2019), stimulating posters by actively commenting or asking questions (Amichai-Hamburger, et al., 2016), disseminating knowledge outside the online community or within different modalities of social networks, such as offline (Wang, et al., 2020; Takahashi, et al., 2007). Despite the importance of lurkers in OKS, there remain three important gaps that are worthy of investigation.

First, prior OKS studies remain silent on an important but neglected question: What motivate lurkers to become active lurkers? Active lurkers, who seek for as well as utilize information in their activities, cannot be neglected in an evaluation of the value of online communities within an organization (Takahashi et al., 2007). Active lurkers engage in two important activities: knowledge collecting and active lurking. The first refers to consulting others to acquire some of their knowledge, while the latter refers to utilizing available and shared knowledge by others (Amichai-Hamburger et al., 2016; Li et al., 2017). Surprisingly, little is known about what drive these two important OKS practices. Building upon Self Determination Theory, we propose that employees can be intrinsically and extrinsically motivated to be active lurkers, engaging in knowledge collecting behavior and active lurking. Self Determination Theory advocates suggest that individual behavior is a product of individual's intrinsic and extrinsic motivation (Hung, et al., 2011; Deci, et al., 1991). In this regard, we bring in the perceived importance of knowledge and perceived reputation as intrinsic and extrinsic motivations to performing active lurking and knowledge collecting behaviors (Nguyen, et al., 2020; Nguyen & Malik, 2020; Nguyen, et al., 2019). Perceived importance of knowledge helps motivate employees by fulfilling their need for cognition as well as enabling them to achieve extrinsic goals (Burgess, 2005; Wah, et al., 2007; Nguyen &

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Malik, 2020). In addition, perceived negative reputation (i.e., being labelled as a free rider) may prevent individuals from passively collecting information by actively propagating gained knowledge to others as compensation (Hung, et al., 2011; Stewart, 2005; Edelmann, 2013).

Second, previous studies have tied OKS to positive organizational outcomes, especially innovation capability (Nugroho, 2018; Wang, et al., 2016). OKS facilitates a firm's ability to develop new offerings or new ways of delivery that are well accepted in the market (Wang, et al., 2016; Saenz, et al., 2012; Yang, et al., 2018) because OKS promote knowledge exchange among employees in the workplace to improve individual capability (Kamasak & Bulutlar, 2010; Xerri & Brunetto, 2011). However, the mechanism that transforms active lurking and knowledge collecting to individual innovation capability is still under-researched. Too much information might kill innovation (Bidault & Castello, 2010; Goh, 2005), otherwise individuals must be able to seek for and identify information that is relevant for them and their jobs. Thus, we propose that only if the active lurkers ask for relevant knowledge and information, active lurking and knowledge collecting practices can increase individual innovation capability.

Third, we propose that organizational culture is a boundary condition that alters the relationships among perceived importance of knowledge, perceived negative reputation influence, active lurking, knowledge collecting behavior and individual innovative capability. Prior research found that organizational culture does matter in driving knowledge sharing behaviors (Nugroho, 2018; Nguyen & Malik, 2020). Collaborative, cooperation, and openness culture were found to promote knowledge sharing behavior as these culture types encourage teamwork and communication amongst organizational members (Yang, et al., 2018; Nugroho, 2018). Organizational culture is established through top management support as reflected on organization policy, reward system, and leadership that promotes the knowledge sharing practices (Lin & Lo, 2015; Donate & de Pablo, 2015). As individuals are more likely to share knowledge when they feel supported by the top management (Lin & Lo, 2015; Donate & de Pablo, 2015), it is likely that they are more willing to perform active lurking and knowledge collecting behavior. In addition, organizational culture can also be reflected through the social structure within an organization, such as how organizational relate and interact with each other, termed as social ties (Chen & Huang, 2007; Chiu, et al., 2006). Organizational culture may represent the interaction frequency, connection with others, emotional intensity and intimacy with other members, and the expected reciprocity (Chen & Huang, 2007; Chiu, et al., 2006). Previous studies showed that social ties support individuals to share their knowledge as it provides comfort and trust (Chen & Huang, 2007; Chiu, et al., 2006); however, the link between organizational culture and other roles within OKS such as lurkers, and knowledge collectors have not known yet.

Lastly, we also examine the above aforementioned relationships in two different types of business, public and private companies. We propose that different business types constitute different individual and contextual nature that may influence OKS, especially lurking and knowledge collecting behavior. Indeed, motivations, values, and goals that employees focus on in the workplace may be different between public and private companies (Liu et al., 2012; Nguyen & Malik, 2020). For instance, a public company is often characterized as having less incentive for innovation as the funding and control are influenced by political issues (Willem & Buelens, 2007). Consequently, the pressure to increase individual innovation capability and the perception of job security is lower in public companies than in private companies (Nguyen & Malik, 2020). Despite the important role of business type as a contextualized phenomenon (Nugroho, 2018; Del Giudice, et al., 2015), the implications of business types on OKS, especially lurking and knowledge collecting behavior, have not been well understood.

Taken together, the objective of this study is threefold: (1) to identify the motivation of active lurkers to participate in online knowledge sharing, (2) to investigate the impact of active lurker behaviors (i.e., active lurking and knowledge collecting) on individual innovation capability, and (3) to examine the differences in motivation and outcomes of active lurker behavior between public and private companies, and organizational culture.

2. Theoretical development

2.1. The self-determination theory

Self-Determination Theory postulates that individuals have the fundamental needs that are crucial for growth, integration, and constructive social development (Ryan & Deci, 2000). Among the fundamental needs are the needs to feel competent with tasks and activities (i.e. the needs for competence), the needs for autonomy, and also the needs to be included or affiliated with others (i.e. the needs for relatedness) (Ryan & Deci, 2000). In fact, the Self-Determination Theory concerns innate psychological needs such as autonomy and relatedness that are essential for self-motivation to achieve positive growth. What more is that the Self-Determination Theory also examines social environments that may influence (i.e., foster or hinder) the individuals' natural tendency as they are able to satisfy those fundamental psychological needs (Ryan & Deci, 2000). Taken together, the Self-Determination Theory concerns the aspects that motivate individuals to act toward positive growth.

By considering the aspects that move individuals to act toward positive growth, the Self-Determination Theory categorizes motivation into two types: intrinsic and extrinsic motivation (Ryan & Deci, 2000). Intrinsic motivation refers to volitional aspects that promote individuals' engagement with activities, such as when individuals think that the activities are fun or interesting (Gagne & Deci, 2005). Whereas extrinsic motivation drive individuals to perform activities that are perceived to be instrumental in achieving a valued outcome that is external to the activity itself (Gagne & Deci, 2005). Subsequently, intrinsic and extrinsic motivation work together to influence the actions of individuals (Gagne & Deci, 2005). For instance, when individuals are not intrinsically motivated, providing an extrinsic motivation will move individuals toward action (Gagne & Deci, 2005).

2.2. Self-determination theory and social network participation

The Self-Determination Theory postulates that satisfaction of intrinsic and extrinsic psychological needs has led individuals to participate in social networking sites (Tsai & Pai, 2014; Kelley & Alden, 2016; Liu & Bakici, 2019; Nikolinakou & Phua, 2020). Consequently, organizations employ social networking sites for in-house knowledge management (Lin, et al., 2020; Liu & Bakici, 2019; Martínez-López, 2014). From a social network or e-business perspective, individuals who have a prominent ability to spread knowledge are central to a social network (Thomas-Hunt, et al., 2003). Underpinning the Self-Determination Theory, prior research has examined various intrinsic and extrinsic motivations leading to knowledge posting behavior (see Appendix 1 and 2 for the papers examining knowledge sharing). Building upon Self-Determination Theory, we propose a theoretical framework as shown in Fig. 1 that illustrates how individuals are motivated to become active lurkers within an OKS platform that collect knowledge as well as propagate and implement the knowledge outside the community.

2.3. Online knowledge sharing in public vs. private companies

There is an increasing interest from scholars in investigating OKS in public and private companies (Nguyen & Malik, 2020; Gammelgaard, 2007). Due to the differences in many aspects such as management purpose and objectives, and organizational structures, employees in public and private companies often hold different motivations, values, and purposes in the workplace and particularly in knowledge exchange activities (Waldner, 2012; Nonnecke, et al., 2006). For instance, public

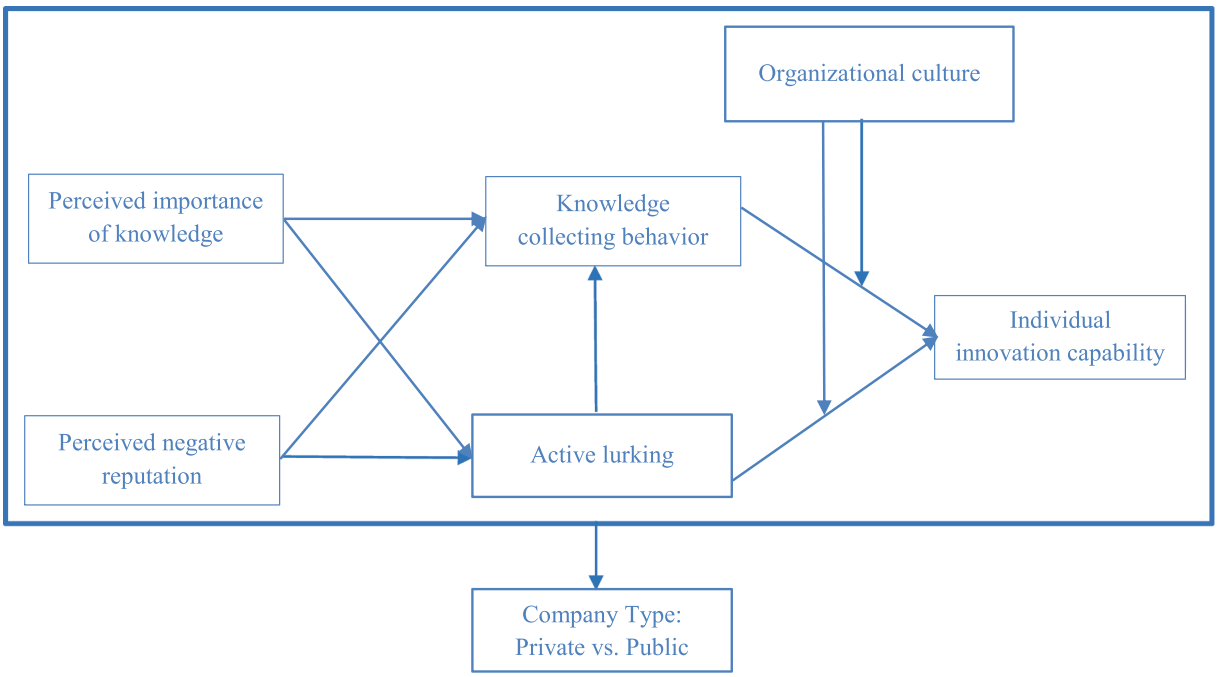


Fig. 1. Conceptual Framework.

companies have more formal procedures and provide less flexibility in the decision making; thus, employees in public companies often do not want to take risk, work in a more bureaucratic manner and exhibit altruistic values (Nguyen & Malik, 2020). Literature suggests that bureaucracy hinders the OKS practices amongst employees (Ngah & Jusoff, 2009). Employees in public companies employees often have greater job security (Boyne, 2002). In contrast, employees in private companies often have more pressure to increase profit to keep their jobs due to fierce competition (Yeh, et al., 2018). Employees in private companies tend to have low job security and be more active in creating a competitive advantage to maintain their position in the company (Boyne, 2002; Nguyen & Malik, 2020). Taken together, we propose that company type will influence the nature of online knowledge sharing activities.

2.4. *Active lurking and knowledge collecting behavior*

Despite the general passive role of lurkers, active lurkers can also contribute to OKS by performing two different behaviors: active lurking and knowledge collecting (Takahashi, et al., 2007; Chen & Hung, 2010). Active lurking is conceptualized as a behavior of individuals who participate in organizational OKS platforms mainly by passively reading the posts and occasionally or never post, yet actively propagate the knowledge acquired to others outside the community and apply the knowledge acquired from the OKS platform (Takahashi, et al., 2007; Sun, et al., 2014). In other words, there are two main characteristics of active lurking behavior. First, they propagate the information outside the community (Takahashi, et al., 2007). Second, active lurkers tend to apply the information gained in organizational activities *vis a vis* to passive lurkers who read posts and gain knowledge on their own (Takahashi, et al., 2007; Sun, et al., 2014). Active lurking behavior is distinct to knowledge collecting behavior in which knowledge collecting behavior represents a behavior of asking for knowledge that is personally needed (Amichai-Hamburger, et al., 2016). In sum, active lurking behavior is actively utilizing the knowledge available and shared by others, whereas knowledge collecting behavior is actively asking for knowledge from others.

2.5. *The antecedents of active lurking and knowledge collecting behavior*

2.5.1. *Perceived importance of knowledge*

Previous study shows that only when individuals perceive that the knowledge or information that was posted is useful, they are more likely to collect knowledge (Park, et al., 2014; Lin, 2007; Burgess, 2005). Perceived importance of knowledge can serve as an intrinsic motivation as individuals believe that the gained knowledge can increase their ability to organize and perform their work or create innovative products (Molina-Castillo et al, 2012; Rizmerita, et al., 2016; Zhang, et al., 2017; Tsai & Pai, 2014). When individuals feel competent, they are directed to perform behaviors that can help them complete the task by using the knowledge shared by others (Tsai & Pai, 2014). Consequently, they are more likely to perform knowledge collecting behavior (Tsai & Pai, 2014). Perceived importance of knowledge also represents an extrinsic motive as individuals are more motivated to acquire knowledge when they believe that the information or knowledge represents a valued resource in their organizations and helps them perform work tasks (Burgess, 2005; Cady & Fandt, 2001). Furthermore, by being able to perform work tasks, individuals expect that they are more trusted by other members of the organization (Burgess, 2005; Wah, et al., 2007), gain more reputation (Thompson & Bolino, 2018), and economic rewards (Bock, et al., 2005). However, as work tasks are distinctive in nature, often the available knowledge is not in line with the needed competence (Prasarnphanich, et al., 2016; Maravilhas & Martins, 2019). Thus, employees have to ask for knowledge from others. In other words, as the knowledge is perceived to increase their competence at work, employees are more motivated to be active lurkers as well as seek the knowledge (Foss, et al., 2009; Lin, 2007; Rioux & Penner, 2001).

By applying the knowledge to the working tasks, individuals can also care and contribute to the organization regardless of the rewards (Rioux & Penner, 2001; Park, et al., 2014). This is consistent with the Self-Determination Theory propositions, which indicate that the needs for relatedness motivate individuals to help the organization (Callea, et al., 2016). Such that, employees are more likely to help the organizations to achieve the need for belonging (Callea, et al., 2016). Thus, as the knowledge is perceived to be important, employees not only tend to collect the knowledge for their own purpose but also apply the knowledge to perform their work tasks and propagate the knowledge to others

(i.e. being an active lurker). In sum, organizations provide several extrinsic motivations in addition to intrinsic motivation (i.e. the need for competence) that encourage employees to collect, seek and apply the knowledge to increase their working competence (Hung, et al., 2011). Formally, we hypothesize that:

H_1. Perceived importance of the knowledge is positively related to (a) active lurking and (b) knowledge collecting behavior in both public and private companies.

2.5.2. Perceived negative reputation

Perceived reputation refers to recognition from the organization members that the employees possess valuable knowledge that elevates the employees' social status (Marett & Joshi, 2009; Lai & Chen, 2014). Reputation is considered as an extrinsic motivation that often valued beyond monetary reward (Jeppesen & Frederiksen, 2006; Lai & Chen, 2014). Previous studies have demonstrated that reputation motive importantly influences online knowledge sharing behavior (Lai & Chen, 2014; Park, et al., 2014; Hung, et al., 2011). As reputation can only be gained when employees contribute to their community, whereas being a passive lurker is often associated with a negative reputation such as free rider, not committed to the community, and no reciprocity (Hung, et al., 2011; Stewart, 2005; Edelmann, 2013). Thus, perceived negative reputation may prevent them from passively gaining knowledge from the online knowledge sharing platform and propagating the knowledge to others and applying knowledge within their job (Amichai-Hamburger, et al., 2016; Edelmann, 2013).

On the other hand, as reputation is valuable for the employees, they may want to protect their reputation (Cady & Fandt, 2001; Gangstead & Snyder, 2000). Such that, employees concern about how they are being perceived by their peers and supervisors (Bolino, et al., 2008). Employees, who often share knowledge and think their knowledge is valuable to others, tend to participate in online communities for social networks and care about their reputation (Liu & Bakici, 2019; Nikolinakou & Phua, 2020). Literature has shown that employees often believe that seeking and collecting knowledge can decrease their perceived reputation (Burgess, 2005; Thompson & Bolino, 2018). Employees are worried that their peers or supervisors perceive them as incompetent by seeking knowledge from others (Thompson & Bolino, 2018; Bolino, et al., 2008). In particular, seeking information may be particularly costly in companies that have high competition among employees and low job security, and hence, employees are less inclined to ask for knowledge (Lee, 2002; Sun, et al., 2014). Instead, they are more likely to read and try to find the answer to their work issues from the knowledge shared (Sun, et al., 2014). Overall, we propose that perceived negative reputation positively influences active lurking behavior, yet is negatively related to knowledge collecting behavior.

H_2. Perceived negative reputation positively related to (a) active lurking and negatively related to (b) knowledge collecting behavior in both public and private companies.

2.6. The relationship between active lurking and knowledge collecting behavior

Although the literature suggests that active lurkers tend to apply the knowledge gained and to propagate the knowledge to others, different employees often face various work difficulties, the knowledge they need may be unique, and the knowledge they gain from organizational online platforms is also unique (Takahashi, et al., 2007; Sun, et al., 2014; Maravilhas & Martins, 2019). The fact that some of the experiences are specific to different work tasks means that the knowledge gained from others cannot easily be applied to other tasks (Prasarnphanich, et al., 2016; Nguyen, 2020a,c). As employees need to adapt the knowledge shared in their work, they need to invest time and resources into addressing their work issues; thus, active lurking tends to lead to knowledge collecting behavior (Han, et al., 2014). The knowledge shared may not answer all the work concerns or issues; employees may need to ask for more information, skills, or expertise to address their work issues or increase knowledge acquisition in online communities (Nikolinakou & Phua, 2020; Takahashi et al., 2003). According to Al-Shammari (2012), to adapt to the changes of technology, competitive environment, and customers' preferences, employees need to acquire more knowledge to create innovative products and serve customers better.

Furthermore, active lurkers spend significant time reading to increase knowledge acquisition and apply the knowledge gained (Amichai-Hamburger et al., 2016). Thus, they tend to ask for knowledge if they have any concerns when reading or have difficulties in applying or in ensuring their understanding is right (Sun et al., 2014). Additionally, when employees understand the topic, want to acquire more knowledge, they tend to ask for more information and wish others share their expertise and skills (Van den Hooff & de Ridder, 2004). Thus, we propose that knowledge collecting is a consequence of active lurking. Therefore, we propose that active lurkers are more likely to perform knowledge collecting behavior. The formal hypothesis is presented as follow:

H_3. Active lurking is positively related to knowledge collecting behavior in both public and private companies.

2.7. The consequences of active lurking behavior and knowledge collecting Behavior: Individual innovation capability

Individual innovation capability refers to the ability to develop and adopt new products which can satisfy the market needs and implement a better technological process (Hurt, et al., 1977). Organizations often emphasize individual innovation capability and focus on innovation of new products and innovation of new product processes because both have social and economic impacts (Ologbo, et al., 2015; Akhavan & Hosseini, 2016). As an example, introduction to new products is generally assumed to have a clear and positive impact on the income growth of the organizations and employees, whereas the process of innovation is more seen from the development of efficiency (Aulawi, et al., 2009; Molina-Castillo, et al., 2012).

Literature suggests that individual innovation capability is influenced by the utilization and accumulation of intellectual resources (Akhavan & Hosseini, 2016). Notably, OKS and acquisition in organizations can be translated into innovation, productivity, and competitive advantage (Molina-Castillo, et al., 2012; Nonaka & Takeuchi, 2007; Kamasak & Bulutlar, 2010). Thus, organizations increasingly manage their intellectual resources internally, including non-codified knowledge (Aulawi, et al., 2009). Such that, organizations promote knowledge exchange among employees in the workplace to improve individual innovation capability (Kamasak & Bulutlar, 2010; Poulis et al., 2019; Xerri & Brunetto, 2011). Trigo et al., (2011) explained that online knowledge sharing and knowledge management perform as core e-business activities and are critical to helping organizations overcome challenges and issues in our ever-changing world.

Knowledge collecting and active lurking create opportunities to maximize an employee's ability to provide solutions and initiatives that lead to creating competitive advantage and enhancing individual innovation capability (Molina-Castillo, et al., 2012; Reid, 2003). Hong et al. (2004) argued that knowledge collecting, as well as active lurking, have a positive association with new product development. Knowledge collecting makes employees voice their need for knowledge to address their difficulties at work (Akhavan & Hosseini, 2016; Lee, 2002). Knowledge collecting often increases the transformation of individual knowledge into organizational social capital, which improves the knowledge pool available to other employees who read and apply the knowledge into their work as well (Akhavan & Hosseini, 2016; Kamasak & Bulutlar, 2010; Nonaka & Takeuchi, 2007).

The relationship between knowledge collecting, active lurking, and

individual innovation capability has been supported by a number of researchers (Kamasak & Bulutlar, 2010; Giustiniano, et al., 2016). Such that, knowledge collecting and active lurking is to accelerate the process of innovation by facilitating synergy and combining ideas, improving the process innovation as well as by considering all ideas simultaneously (Ardito, et al., 2018; Darroch & McNauhgton, 2002; Wang & Wang, 2012). Lin (2007) reported that the exchange of knowledge, including knowledge collecting and active lurking, increases individual innovativeness in terms of promoting and implementing new ideas. Therefore, it is predictable that employees' knowledge collecting and active lurking can increase their ability to innovate in their companies (Ardito, et al., 2018). However, as the organizational aspects within private companies are more supportive of OKS and innovation compared to public companies (Nguyen & Malik, 2020; Yeh, et al., 2018; Boyne, 2002), we proposed that active lurking only promotes innovation capability in private companies. However, as employees with knowledge collecting behavior tend to seek knowledge independently according to what they need (Park, et al., 2014), the effect on innovation capability is consistent in both private and public companies:

H_4. (a) active lurking is positively related to individual innovation capability in private (vs. public) companies, while (b) knowledge collecting behavior is positively related to individual innovation capability in both private and public companies.

2.8. The Moderated moderation: Role of organizational culture and company type

2.8.1. Organizational culture

Even though many organizations have applied different policies to motivate employees to disseminate codified knowledge that resides within the organization, the literature suggests that organizations vary in their support for online knowledge sharing activities (Wiewiora, et al., 2013; Zhang, 2018). Organization supports the online knowledge sharing activities represents its own characteristic that guides the behavior, communication, and working relationship among the organizational members that are often termed as organizational culture (Tseng, 2010). Notably, organizational culture is one of the key contextual components that influence online knowledge sharing practices within an organization; thus, organizations need to create a favourable online knowledge sharing culture (Park, et al., 2004; Tseng, 2010). For instance, organizations that adopt dynamic, entrepreneurial, and creative workplaces encourage employees to exchange knowledge compared to organizations that adopt formalized and hierarchically structured procedures (Tseng, 2010). Consistent with the Self-Determination Theory, organizational culture is strongly related to the autonomy degree of employees in performing online knowledge sharing activities (Jones, et al., 2006; Llopis & Foss, 2016).

Furthermore, when the organizational culture supports OKS, organizations can create opportunities for employees to generate new ideas and develop innovation (Von Krogh, et al., 2012; Hung, et al., 2011). Such that, when employees ask for tacit knowledge, which is then converted into the explicit knowledge shared in the organizational online platform through active lurking and knowledge collecting behavior, collective learning is generated, which in turn produce new knowledge and increase the knowledge pool (Von Krogh, et al., 2012; Nonaka & Takeuchi, 2007). In other words, organizational culture determines the motivational aspects that influence employees to engage in online knowledge sharing activities (Hung, et al., 2011; Tseng, 2010).

As organizatinal culture is multi-dimensional, we would like to focus on dimensions that are relevant to online knowledge sharing practice: top-management support and social interaction ties (Nguyen, 2019). Top management may support the online knowledge sharing practices by providing structure, facilitation, and supports to maintain and cultivate online knowledge sharing culture (Koch, 2003). Importantly, the most critical role of top management supports is by establishing organizational climate (Lin, 2007). A study by Hung, et al. (2011) demonstrated that organizational supports such as economic rewards and reputation positively influence the innovative outcomes. In addition, management may establish a pleasant work environment that encourages employees to generate more new ideas based on the knowledge gained from the online knowledge sharing process (Giustiniano, et al., 2016; Hung, et al., 2011).

The next organizational culture dimension is the social interaction ties that represent the closeness and interaction frequency of a relationship amongst the organizational members (Liao & Chou, 2012). Social interaction ties represent one's attitude toward other employees and reflect a strong bond among employees (Munzel & Kunz, 2014). Previous studies revealed that strong social ties might motivate individuals to engage in more interpersonal activities, such as sharing and receiving information from others (Liao & Chou, 2012). Other studies also found that when the trust amongst organizational members is strong, it provides the employees with emotional safety to put forward ideas and opinions (Ismail, 2005; Hung, et al., 2011). In other words, social interaction ties can be seen as the direct route for information and knowledge flow that provides the opportunity for employees to share or gain knowledge (Liao & Chou, 2012).

However, the literature suggests that information overload cancels out the benefit of having more perspectives and ideas unless employees can filter the knowledge that benefits their jobs (Sethi, et al., 2002). Therefore, we proposed that the top management support negatively moderates the relationship between active lurking with innovative capability. As knowledge collecting behavior allows employees to gain relevant knowledge (Nguyen, 2019; Park, et al., 2014), we propose that organizational culture positively moderates the relationship between knowledge collecting behavior with innovative capability. However, as public companies tend to be more bureaucratic and less innovative, we propose that organizational culture making employees are less motivated to apply knowledge in their task for innovation purpose (Boyne, 2002; Nonnecke, et al., 2006); hence, organizational culture that supports knowledge sharing will not moderate the effect of active lurking and knowledge collecting behavior on innovative capability.

H_5. Organizational culture (a) negatively moderates active lurking and innovation capability and (b) positively moderates knowledge collecting behavior with innovation capability, only in private (vs. public) companies.

3. Research methods

3.1. Sample and data collection

The data in this study were collected in Vietnam, targeting employees in Vietnamese banking companies with experiences in organisational online knowledge platforms. The banking context was selected due to the important knowledge management practices within this industry, and the industry generally has appropriate information technology infrastructure to facilitate organizational online knowledge sharing (Tohidinia & Mosakhani, 2010; Kim & Lee, 200; Nguyen, 2020). The data collection was conducted using a three-stage process. In Stage One, prior to distributing the questionnaire, in order to ensure relevance within the banking context, we had a thorough discussion of selected items and measures with serval senior executives from different departments in the banking industry. These executives had at least three years of online knowledge sharing in organizations. Some changes were made after the discussion to enhance face validity and clarity.

Stage Two involved questionnaire translation and pilot testing. The original questionnaire in English was developed based on the scales in previous studies and then was translated into Vietnamese using back-translation method (Brislin, 1970). The questionnaire was translated from English into Vietnamese by two professionals; then, the Vietnamese version was translated back to Vietnamese by another

professional to ensure accuracy. The final Vietnamese version was subsequently pilot tested with 30 employees. After this testing, the questionnaire was revised to improve validity and readability.

In Stage Three, a formal online questionnaire was developed based on the SurveyMonkey platform. Two filter questions were raised to ensure that the respondents had experiences with organizational online knowledge sharing platforms in the previous three months. The introduction of the project was presented, and written instruction was included, which assured respondents of anonymity and the participation in the survey was voluntary. A phone call to some large Vietnamese banks was made to ask for the support in data collection; only seven bank branches agreed to help with questionnaire distribution. An invitation email with the online questionnaire link was sent to the human resource departments of these two banks, which was then sent to their employees. After three months of data collection, two hundred responses obtained from full-time employees were eligible and used for data analysis. Of two-hundreds respondents, 40.5% were male, and 59.5% were female. The majority of respondents aged from 21 to 30 (58.5%), followed by those aged from 31 to 40 (33%), from 41 to 50 (6%), and from 51 to 60 group (2.5%). Almost 80% of respondents hold a bachelor's degree.

3.2. Measurement

All items were adapted from previous studies and were evaluated on a 7-point Likert scale from 1 for 'strongly disagree' to 7 for 'strongly agree'. Perceived importance of knowledge assessed an employee's perception of the importance of knowledge in organizations. We used a three-item measure based on the work of Burgess (2005) with a sample item such as: "*Knowledge is a valuable resource in my company*". Perceived negative reputation scale is also adopted from Burgess (2005). The scale consists of three items, such as: " *Seeking knowledge from other people may make me look less knowledgeable than I really am*". Individual innovation capability was assessed using a four-item measure was adopted from the study of Hurt et al. (1977). A sample item for individual innovation capability was: "*I feel myself become more creative because of continuous learning in organsization*".

We adopted a three-item measure from the study of Akhavan & Hosseini (2016) to measure knowledge collecting behavior. The items such as: "*When I need new information or skills, I will post the questions on my organizational online platforms*". Active lurking assessed in this study includes active reading and active applying. Active reading assessed the reading behavior of employees to accumulate information in organizational online platforms. We used a four-item scale to measure active reading based on a study conducted by Takahashi and colleagues

Table 1
Construct measurement and confirmatory factor analysis.

			Mean	SD	Factor loading	α	CR	AVE
Perceived importance of knowledge	PIK1	Knowledge is important in getting ahead in my company	5.22	1.35	.92	0.94	0.94	0.84
	PIK2	Knowledge is a valuable resource in my company	5.29	1.24	.95			
	PIK3	People with a lot of knowledge are more successful in my company	5.33	1.33	.88			
Perceived negative reputation	PNR1	Seeking knowledge from other people may make me look less knowledgeable than I am really.	3.59	1.77	0.97	0.98	0.98	0.94
	PNR2	Seeking knowledge may imply a lack of competence.	3.62	1.75	0.97			
	PNR3	Seeking knowledge too many times can make me look bad.	3.56	1.80	0.97			
Knowledge collecting	KCO1	When I need new information or skills, I will post the questions on my organizational online platforms	5.21	1.41	0.86	0.85	0.85	0.66
	KCO2	When one of my colleagues is good at something I ask him/her to teach me how to do that thing on my organizational online platforms	4.97	1.53	0.75			
	KCO3	When my colleagues have learned something new, I will ask them about that on my organizational online platforms	5.00	1.50	0.82			
Active reading	ARE1	I often use organizational online platforms to read information and gain knowledge	3.73	1.93	0.79	0.92	0.92	0.74
	ARE2	I often read knowledge that is shared in my organizational online platforms	3.73	1.89	0.87			
	ARE3	I often update the latest information and knowledge shared in my organizational online platforms	3.71	1.68	0.98			
	ARE4	I tend to accumulate information and knowledge shared in my organizational online platforms	3.56	1.79	0.78			
Active applying	AAP1	I often propagate the knowledge gained from organizational online platforms to other colleagues.	3.78	1.82	0.70	0.86	0.87	0.69
	AAP2	I often use the knowledge gained from organizational online platforms for organizational activities.	4.41	1.61	0.81			
	AAP3	I am aware that the knowledge gained from organizational online platforms has changed my thoughts towards my career and my company.	4.56	1.50	0.96			
Top management support	TMS1	The top management in my company emphasizes the importance of online knowledge sharing between work units	5.18	1.38	0.94	0.95	0.95	0.87
	TMS2	The top management in my company highly encourages employees to share knowledge online	5.21	1.43	0.93			
	TMS3	The top management in my company makes consistent efforts to foster a culture of online knowledge sharing (e.g., offering rewards)	5.14	1.39	0.93			
Social interaction ties		Sharing knowledge online allows me to						
	SIT1	strengthen ties between my work colleagues.	5.23	1.37	0.95	0.98	0.98	0.89
	SIT2	become well-acquainted with new colleagues.	5.29	1.39	0.95			
	SIT3	expand the scope of my association with other colleagues across the organization.	5.28	1.38	0.92			
	SIT4	foster cooperation with my work colleagues	5.26	1.43	0.96			
	SIT5	create strong relationships with some work colleagues.	5.32	1.35	0.94			
Individual innovation capability	CRE1	I enjoy trying out new ideas.	4.89	1.37	0.91			
	CRE2	I have strong eager of discovery leads to new ideas.	4.83	1.37	0.88	0.96	0.96	0.83
	CRE3	I seek out new ways to do things.	4.97	1.39	0.89			
	CRE4	I frequently improvise methods for solving a problem when an answer is not apparent.	4.91	1.33	0.93			
	CRE5	I feel myself become more creative because of continuous learning in organsization.	4.91	1.30	0.94			

SD: Standard deviation; α: Cronbach's alpha; CR: Composite reliability; AVE: Average variance extracted

(2003). An example of the scale items is "*I often read knowledge that is shared in my organizational online platforms*". Active applying assessed how employees apply the knowledge shared in organizational platforms. We used a three-items scale to measure active lurking based on the study of Takahashi et al. (2007). A sample item is "*I often use the knowledge gained from organizational online platforms for organizational activities*".

Organizational culture in this study includes top management support and social interaction ties. Top management support assessed the support of top management in encouraging online knowledge sharing between work units or the effort to create a favourable culture. A three-item scale of top management support was adapted from the study of Kang, et al. (2008) as such: "*The top management in my company makes consistent efforts to foster a culture of online knowledge sharing*". Social interaction ties assessed the perception of the social interaction ties if employees share knowledge using a five-item scale that was adopted from the study of Kwahk and Park (2016). A sample item for the social interaction scale is "*Sharing knowledge online allows me to strengthen ties between my work colleagues*". The list of the scale items is presented in Table 1.

3.3. Common method variance

Both ex-ante and ex-post procedures were undertaken following the suggestion of Lindell and Whitney (2001). For the ex-ante process, the scales from previous studies were adopted in this study; a pilot study was conducted; participants were confirmed that their responses would be kept anonymous, and similar questions were located in different sections of the questionnaire. For ex-post procedures, firm operation period was used as a marker variable (Lindell & Whitney, 2001). With the marker variable, the change in mean in correlations of all constructs was less than 0.01. Another remedy following the recommendation of Bharati, et al. (2015) was using variance inflation factor (VIF). Each variable was examined in turn as a dependent variable while the other variables played a role as determinants. The VIF scores of all constructs were less than 3.3, indicating that the data had no issue with multicollinearity and common method bias.

4. Results

The component-based partial least squares (PLS) approach using Smart-PLS 3 software was used in this study due to the small sample size and complex structural models with both reflective and formative constructs (Hair et al., 2014; Sarstedt et al., 2019). As this study collected only 200 responses, relatively small, and contained some formative second-order construct (active luring, organizational culture, and organizational innovation), PLS was deemed to be best suited.

4.1. Measurement model

As shown in Table 1, all Cronbach's alpha values and the composite variables of all constructs were greater than.70 (Voorhees, et al., 2016). The convergent and discriminant validity of the measurements were evaluated through four tests following the suggestion of Voorhees et al., (2016). First, as seen in Table 1, all AVEs are well above 0.50, exceeding the threshold value suggested by Voorhees et al. (2016). Second, as Table 2 presents, the square root of the AVE values (in bold) of each construct was larger than accordingly off- diagonal correlations (Voorhees, et al., 2016). Third, each item's loading surpassed.70 (Voorhees, et al., 2016). Four, following Henseler et al. (2015), we assessed the heterotrait-monotrait ratio (HTMT) of the correlations by dividing the average of the heterotrait-heteromethod correlations (i.e., the correlations between constructs) by the average of the monotrait-heteromethod correlations (i.e., the correlations of indicators within the same construct). All the values of the HTMT were lower than the threshold of 0.85 (Voorhees, et al., 2016). Jointly, adequate convergent and discriminant validity of the measurements were indicated.

4.2. Hypothesis testing

In order to compare the difference between public and private companies, the sample was divided into two groups: public (n = 105) and private (n = 95). To test the hypotheses, the structural model was assessed. A multi-group analysis with 1000 subsamples was assessed. The coefficient of determination (R^2) of knowledge collecting and individual creativity was all above 44%, indicating sufficient explanatory power for the model. H1(a) and H1(b) proposed that perceived importance of knowledge is significantly positively related to knowledge collecting and active lurking. As shown in Model 1 in Table 3, there was a significant impact from perceived importance of knowledge on active lurking ($\beta_{public} = 0.24$, $p < .05$ and $\beta_{private} = 0.14$, $p < .05$) and on knowledge collecting ($\beta_{public} = 0.57$, $p < .001$; and $\beta_{private} = 0.62$, $p < .001$) in both subgroups; thus, H1(a) and H1(b) were supported for both public and private groups.

H2 hypothesed that perceived negative reputation significantly affected (a) active lurking and (b) knowledge collecting in public and private companies. The results supported H2(a) ($\beta_{public} = 0.67$, $p < .001$; $\beta_{private} = 0.74$, $p < .001$) but not H2(b) ($\beta_{public} = -0.08$, $p > .05$; $\beta_{private} = -0.20$, $p > .05$). H3 proposed that active lurking was significantly positively related to knowledge collecting behavior in both public and private groups. The results showed in Model 1 in Table 3 that active lurking significantly affected knowledge collecting behavior ($\beta_{public} = 0.30$, $p < .05$; $\beta_{private} = 0.43$, $p < .001$); thus, H3 was supported for the private and public groups. H4 (a) postulated that active lurking affects individual innovation capability positively in the private group but negatively in the public group. Whereas H4 (b) posits that knowledge collecting positively affects individual innovation capability in both groups. As seen in Model 1 in Table 3, H4 (a) ($\beta_{public} = 0.09$, $p > .05$ and $\beta_{private} = 0.39$, $p < .001$) and H4 (b) ($\beta_{public} = 0.56$, $p < .001$ and $\beta_{private} = 0.40$, $p < .001$) were supported.

To check the moderating effect of organizational culture as proposed in H5, Model 2, which examined the interaction between organizational culture and active lurking and between organizational culture and

Table 2
Correlations.

	1	2	3	4	5	6	7	8	9	10
1.Perceived importance of knowledge	**0.92**									
2.Perceived negative reputation	0.24	**0.97**								
3.Knowledge collecting	0.40	0.16	**0.81**							
4.Active reading	0.36	0.64	0.21	**0.86**						
5.Active applying	0.39	0.45	0.29	0.33	**0.83**					
6.Product innovation	0.54	0.19	0.36	0.14	0.31	**0.90**				
7.Process innovation	0.37	0.17	0.24	0.14	0.20	0.49	**0.93**			
8.Top management support	0.51	0.17	0.47	0.11	0.38	0.46	0.36	**0.93**		
9.Social interaction ties	0.55	0.27	0.43	0.11	0.21	0.40	0.34	0.63	**0.94**	
10.Individual innovation capability	0.43	0.17	0.35	0.12	0.49	0.44	0.41	0.56	0.51	**0.91**

Diagonal elements represent the square root of the average variance extracted (AVE)

Table 3
Structure equation model results.

Path	Model 1			Model 2		
	Public	Private	T[a]	Public	Private	T[a]
Control variable						
Gender → Individual innovation capability	-0.08	0.09		-0.03	0.02	
Education → Individual innovation capability	0.06	0.01		0.00	0.06	
Main effect						
Perceived importance of knowledge → Knowledge collecting	0.57***	0.62***	0.05	0.57***	0.62***	0.05
Perceived importance of knowledge → Active lurking	0.24*	0.14*	0.10	0.24*	0.14*	0.10
Perceived negative reputation → Knowledge collecting	-0.08	-0.20		-0.08	-0.20	
Perceived negative reputation → Active lurking	0.67***	0.74***	0.07	0.67***	0.74***	0.07
Active lurking → Knowledge collecting	0.30*	0.43***	0.04	0.30*	0.43***	0.13
Active lurking → Individual innovation capability	0.09	0.39***		0.05	0.48***	
Knowledge collecting → Individual innovation capability	0.56***	0.40***	0.15	0.15	-0.11	
Moderating effect						
Organizational culture → Individual innovation capability				0.53***	0.68***	0.15
Active lurking × Organizational culture → Individual innovation capability				0.11	-0.31**	
Knowledge collecting × Organizational culture → Individual innovation capability				-0.09	0.16*	
R^2						
Active lurking	0.63	0.63		0.63	0.63	
Knowledge collecting	0.67	0.67		0.67	0.67	
Individual innovation capability	0.44	0.44		0.65	0.65	

Note: ***p less than 0.001, **p less than 0.01, *p < .05.

knowledge collecting, was assessed. The results of Model 2 in Table 3 show that organizational culture had a moderating effect only in private companies. In particular, organizational culture negatively moderated the impact of active lurking on individual creativity ($\beta_{private} = -0.30$, $p < .01$) and positively moderated the impact of knowledge collecting on individual creativity ($\beta_{private} = 0.16$, $p < .05$). Organizational culture did not have a moderating effect on the active lurking – individual creativity relationship ($\beta_{public} = 0.11$, $p > .05$) and on the knowledge collecting – individual creativity relationship ($\beta_{public} = -0.09$, $p > .05$) in the public companies. Therefore, H5(a) and (b) were supported for both groups.

5. Discussion

This study drew upon the Self-Determination Theory to examine lurkers from a bright side of active lurking behavior. The results indicated that when employees perceive the importance of knowledge, they tend to actively collect and read the knowledge shared on organizational online platforms. However, the perception of negative reputation tends to make employees less likely to directly ask people to share knowledge. One potential reason is that employees are more likely to think that seeking knowledge from others make them look less knowledgeable or imply a lack of competence. Active lurking in this case can be seen as a way for employees to keep their 'face' while learning from others through actively reading the information and knowledge shared on organizational online platforms. These results are aligned with previous studies such as Amichai-Hamburger et al. (2016) and Ridng and et al. (2006), who found that active lurking is a learning method because lurkers can learn from the knowledge shared by other participants to increase self-efficacy.

Interestingly, our study found that active lurking often leads to knowledge collecting behavior. Active lurkers are often motivated by the knowledge shared in organizational online platforms and want to learn more to improve their knowledge. Active lurkers often update and accumulate the latest information and knowledge shared, and then they are more likely to share the knowledge gained with other colleagues and apply them to their organizational activities. These behaviors seem to make them more confident, and thus they want to prove their knowledge by asking other colleagues to teach them new things or skills. Active lurking can motivate employees from passive learning via only reading knowledge shared to active learning via knowledge collecting, asking for knowledge. These findings extend those of some prior researchers such as Amichai-Hamburger et al. (2016) and Ridings et al. (2006). Amichai-Hamburger et al. (2016) and Nguyen (2020) believe that active lurkers have their own opinions and ideas and can contribute valuable knowledge, but they need time to get used to the communities. In a large community, Amichai-Hamburger et al. (2016) and Nguyen (2020) agreed that lurking might be advantageous to reduce repetitive questions and ensure the relevance of postings.

Our study also found that the differences between employees in public and private companies lead to the differences in their motivation to participate in the exchange of knowledge and their motivation to increase knowledge acquisition to enhance individual innovation capability. The findings of this study show that in public companies, active lurking is not related to individual innovation capability, while in private companies, active lurking significantly affects individual innovation capability. The pressure to increase innovation capability in public companies is not as strong as in their private counterparts; thus, employees in public companies can actively read and apply the knowledge gained but do not think about creating new ideas or findings new working methods. In contrast, employees in private companies tend to look for ways to increase innovation capability through reading and applying the knowledge gained. Furthermore, in private companies that have a strong organizational culture of online knowledge sharing, employees are motivated to ask for information and expertise from others to increase innovation capability. As knowledge demanded for each work task is different, and only active lurking is not enough to ensure employees understand and apply right. These findings extend those of previous studies such as Nguyen and Malik (2020) and Nguyen (2020). Nguyen and Malik (2020) found that public and private companies often have different goals, funding and control in which fragmented authority and less incentive for efficiency tend to make employees in public companies have less motivation to increase innovation capability. Nguyen (2020) found that in an organization that has a strong organizational culture of knowledge sharing, employees are more likely to have more enjoyment in participating in the online knowledge sharing process.

6. Implications

6.1. Theoretical implications

This study extends the online knowledge sharing literature by focusing on active lurkers. Previous studies have tended to pay more attention to posters because they generate content and contribute to the pool of knowledge that benefits all members. However, lurkers often account for the majority of members (Marett & Joshi, 2009; Cranefield,

et al., 2015), they need to be examined to further understand their value in organizational online platforms. To the best of our knowledge, active lurkers and their behavior have not been empirically examined. This study is the first one that investigates active lurkers and their behavior in organizational online knowledge sharing to bring insights into those who often make up the majority of online participants.

This study also extends the scope of the online knowledge sharing literature. Previous studies have placed the main focus on the driving factors of online knowledge sharing behavior while few studies have examined the organizational outcomes of the online knowledge sharing process, such as individual innovation capability. However, when organizations invest in online platforms, one of the main purposes is to increase the exchange of knowledge among employees and help each other in problem-solving and improve individual innovation capability, which often leads to the creation of organizational competitive advantage (Kwahk & Park, 2016; Masa'deh, et al., 2016). Therefore, this study helps to estimate the effectiveness of the online knowledge sharing process through measuring organizational outcomes of individual innovation capability.

This study provides another approach to active lurkers in the online knowledge sharing literature. There is a stereotype that posters are valuable because they can contribute to online communities while lurkers are illegitimate and peripheral members (Amichai-Hamburger, et al., 2016; Preece, et al., 2004). However, the findings of this study show that active lurkers are not non-users, but rather are active and goal-driven participants (Nguyen, 2020). Active lurkers learn from reading and applying the knowledge shared in organizational online platforms, asking for expertise and skills to address their work issues to increase individual innovation capability. Active lurkers have their way of contributing to the organization.

Impression management motives often involve the impact of perceived importance of knowledge and perceived negative reputation on knowledge collecting (Cady & Fandt, 2001). Previous studies often examine the pull force between two opposite perceptions (Cady & Fandt, 2001). On the one hand, employees are likely to collect knowledge due to the perceived importance of knowledge (Cady & Fandt, 2001; Gangstead & Snyder, 2000). On the other hand, employees often hesitate to collect knowledge because they may feel shameful or lose reputation to ask for knowledge (Cady & Fandt, 2001; Gangstead & Snyder, 2000). However, this study extends the options to include active lurking behavior. To increase knowledge acquisition, active lurking is another choice that balances the perceived importance of knowledge and perceived negative reputation. Perceived importance of knowledge influences knowledge collecting and active lurking, but perceived reputation significantly affects active lurking. However, active lurking tends to result in knowledge collecting.

Organizational culture has been mainly examined as the determinant of online knowledge sharing behavior. However, in the online knowledge sharing literature, there is a growing number of studies that indicate that organizational culture has a moderating effect on the relationships between motivators and online knowledge sharing behavior (Nguyen, 2020c; Nguyen & Nham, 2019; Nguyen et al., 2019). This study consolidates the moderating role of organizational culture. Especially, future research needs to consider examining organizational culture when investigating different types of companies.

6.2. Managerial implications

From the findings of this study, some managerial implications are proposed. First, management should change their view of active lurkers in a positive way. Misunderstanding lurking may lead to negative policies in an online community toward lurkers (Edelmann, 2013). Second, management should emphasize the importance of knowledge and knowledge exchange to increase individual innovation capability. Management needs to stress that knowledge exchange in online platforms to improve individual innovation capability is a means to contribute to the development of the company. Management may want to use online platforms as a formal way to distribute news or information to employees. By doing so, employees tend to engage in online platforms and the online knowledge sharing process. Finally, management needs to provide a favourable online knowledge sharing environment to make employees feel comfortable asking for information or expertise (Nguyen & Malik, 2020; Nguyen et al., 2019). Top management needs to show their support for knowledge exchange among employees as well. Enhancing social interaction ties is also a core to motivate employees to learn from each other without the fear of losing reputation.

7. Conclusion, limitations, and future research

Building upon the self-determination theory, this study examined the impact of the individual and organizational factors on employee's motivation to engage in active lurking behaviors. The findings of this study indicated that active lurkers should also be seen from a bright side and active lurking behavior is a way to learn from others to improve individual innovation capacity. Organizational types and culture are important moderating variables as they can turn lurkers into active participants in organizational online knowledge sharing and increase their innovative capability.

This study has several limitations. First, we used self-reporting technique to measure individual innovation capability, whereas other studies suggest that individual performance, such as innovation capability, should be measured by their superiors to get a more accurate indicator (Moussa & Arbi, 2020; Ouyang, et al., 2015). Future studies are advised to combine self-rated and supervisor-rated innovation capability to enhance the accuracy of innovative capability assessment. Second, previous studies have demonstrated the influence of various intrinsic and extrinsic motivations that influence OKS participations (Zhang, et al., 2017; Nguyen & Malik, 2020; Nguyen, 2020b). However, this study is limited to two aspects, which is the perceived importance of knowledge and perceived reputation. Although the hypothesized relationships were supported, future studies can explore other variables that can intrinsically and extrinsically motivate OKS. In addition, the current study did not control for other variables that might intervene in the proposed relationships. Thus, future research can increase the robustness of the findings by including important control variables based on previous studies such as trust, leadership or self-efficacy.

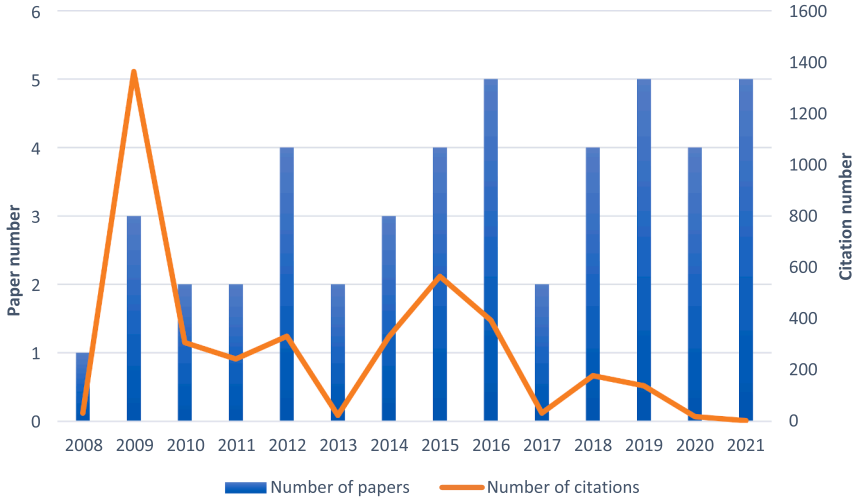
Third, although we were aware that organizational culture comprises many dimensions (e.g. collectivism, centralization, reciprocity), our study limits only two dimensions (top-management supports and social interaction ties), thus the internal validity is compromised (Yang & Zhou, 2015; Sarkar, 2009; Molina-Castillo, et al., 2012). Furthermore, although we hypothesized that organizational culture moderates the link between active lurking and individual innovation capability, previous studies found that organizational culture can also enhance individual motivation to promote OKS (Nguyen & Nham, 2019; Nguyen & Malik, 2020). Thus, we suggest that future studies examine the effect of other dimensions of organizational culture on the relationship between active lurking and organizational outcomes. Lastly, this study is specifically conducted in the banking industry in Vietnam. Previous studies show that different industries tend to apply different policies and procedures to support innovation and hence, have a different level of innovation culture and outcomes (De Jong & Vermeulen, 2006). Specifically, financial services are categorized as a highly innovative and knowledge-sharing intensive industry (De Jong & Vermeulen, 2006; Kim & Lee, 2006). Future research within different types of industries such as retail services, catering services, wholesale, and transport are generally low in innovative culture (De Jong & Vermeulen, 2006).

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence

the work reported in this paper.

Appendix 1:. Papers on knowledge sharing underpinning Self-Determination Theory over years



Appendix 2:. Papers on knowledge sharing underpinning Self-Determination Theory

Year	Author[the number of citations*]
2008	Hwang (2008)[32]
2009	Gagne (2009)[792]; Heo and Toomey (2015)[17]; Stone et al. (2009)[554]
2010	Cameron Cockrell and Stone (2010)[71]; Cho et al. (2010)[236]
2011	Chiu et al. (2011)[232]; Hwang (2011)[11]
2012	Oyefolahan et al. (2012)[12]; Todorova et al. (2012)[67]; Wu and Zhu (2012)[126]; Yoon and Rolland (2012)[126]
2013	Alhalhouli et al. (2013)[21]; Liuliang (2013)2
2014	Bello and Oyekunle (2014)[26]; Ma and Chan (2014)[298]; Rusu and Avasilcai (2014)[5]
2015	Foss et al. (2015)[105]; Ozlati (2015)[41]; Tangaraja et al. (2015)[168]; Wang and Hou (2015)[251]
2016	Andreeva and Sergeeva (2016)[58]; Hussein et al. (2016)[91]; Jiang and Hu (2016)[44]; Lee (2016)[81]; Llopis and Foss (2016)[119]
2017	Ibrahim and Heng (2017)[6]; Saide et al. (2017)[26]
2018	Bach et al. (2018)[0]; Bavik et al. (2018)[165]; Cockrell et al. (2018)[6]; Mohammad et al. (2018)[7]
2019	Coun et al. (2019)[26]; Gagné et al. (2019)[90]; Gupta and Thomas (2019)[6]; Nguyen et al. (2019)[12]; Suwanti (2019)[4]
2020	Doronin et al. (2020)[2]; Mohd Rasdi and Tangaraja (2020)[5]; Shwartz-Asher et al. (2020)[2]; Wu and Lee (2020)[9]
2021	Imam (2021)[2]; Kim and Park (2021)[0]; Lee (2021)[0]; Reslan et al. (2021)[0]; Wu et al. (2021)[0]

*the number of citations was recorded on 8 September 2021

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