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THE INFLUENCE OF THE BIG FIVE PERSONALITY FACTORS IN KNOWLEDGE SHARING

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Abstrak

Knowledge is a combination of various elements such as experience, expert view that can be used as a basis to understand new experience or information. Knowledge will grow if it is shared. Knowledge sharing (KS) can happen is depend on enablers. One of them is high levels of trust. Research showed that there is a relationship between personality and interpersonal trust. The Big Five Personality (BFP) factors have been used to observe different personality traits. Those factors are Extraversion, Neuroticism, Openness to Experience, Agreeableness, and Conscientiousness. In this research project, the researcher wants to prove whether there is a relationship between the BFP factors and KS.

Data were collected from undergraduate students from Faculty of Creative Multimedia (FCM) and Faculty of Management (FOM) in Multimedia University (MMU) to support the research. Based on the sample, this study determines which factors of the BFP that have potential to influence KS.

This study cannot represent the generalisation of undergraduate students in Malaysian universities because of the small sample and the author only focused on one university. Recommendations have been given for other researchers who have desire to pursue their research in this topic.

Kata Kunci : ***knowledge sharing, big five personality***

1. INTRODUCTION

Knowledge is a combination of various elements such as experience, expert view that can be used as a basis to understand new experience or information (Davenport & Prusak, 1998). To be sustainable in globalisation, organisation/company must develop its knowledge assets (Xue & Zhang, 2010). Knowledge can increase company's competitive advantage (Xue & Zhang, 2010; Davenport & Prusak, 1998).

The era of knowledge economy appeared because of the evolution from agricultural age to industrial age (Giju, Badea, Lopez Ruiz, & Pena, 2010). In knowledge-based economy, the creation of goods and services is not only dependent on tangible assets (e.g. labour, land, and capital) but predominantly dependent on intangible assets (e.g. knowledge and experience) (Volkov & Garanina, 2007). In his book "The Age of Discontinuity", Drucker (2008) coined the term *knowledge worker*. Knowledge worker refers to a person who uses his/her brain more than muscles when s/he is working (Mladkova, 2011; Drucker, 2008). Mladkova (2011, p.1) mentioned that "Knowledge workers represent more than half of all employees in advanced economies".

Knowledge worker's job is to create, distribute, and apply knowledge (Mladkova, 2011; Davenport, 2005). Knowledge management (KM) can help knowledge workers to fulfill their job duties. KM is management of intangible assets that can produce value to the company (Giju et al., 2010). KM is the process of capturing and making use of knowledge that can be found in documents (explicit knowledge) or in people's head (tacit knowledge) (Awad & Ghaziri, 2004). Awad and Ghaziri (2004) mentioned up to 95 percent of information is stored in people's head. Organisation owns the superb and valuable knowledge that is stored in employees' head (Kokavcova & Mala, 2009).

KM processes comprise of creation, codification, transfer, sharing, storage, distribution, and utilization of knowledge (Xue & Zhang, 2010). KM could not happen without people sharing knowledge with other people (Xue & Zhang, 2010; Carlin & Womack, 1999). Knowledge sharing (KS) is regarded as a center of KM (Xue & Zhang, 2010).

KS is the process of exchanging implicit (tacit) and explicit knowledge among individuals (Nguyen & Kreng, 2009). KS should be part of the company's culture (Xue & Zhang, 2010). The biggest obstacle in implementing KM is people do not want to share their knowledge with others. One of the causes is lack of trust (Riege, 2005; Davenport & Prusak, 1998). Nguyen and Kreng (2009) defined interpersonal trust as an expectancy of individual or group to the promise or deed of other individual or group. Interpersonal trust can enhance KS in a working environment (Abrams, Cross, Lesser, & Levin, 2003; Mayer, Davis, & Schoorman, 1995).

Mooradian, Renzl, and Matzler (2006) found that there is a relationship between personality and trust. "Experience", "values", and "personality" can encourage people to trust in a certain situation (Karkoulian &

Osman, 2009; McShane & Von Glinow, 2008). The Big Five Personality (BFP) factors have been used to observe different personality traits (Teh, Yong, Chong, & Yew, 2011). The BFP factors were introduced by McCae and Costa in 1982 (Karkoulian & Osman, 2009). Those factors are Extraversion, Neuroticism, Openness to experience, Agreeableness, and Conscientiousness (Karkoulian & Osman, 2009; Goldberg, 1990).

Based on discussion above, this study will analyse whether there is a relationship between individual's personality and KS via interpersonal trust.

Many researches regarding to KS have been done in various environments such as hospitality industry (Hu, Horng, & Sun, 2009), hospital (Seewon, Seung, & Ingoo, 2003), Research and Development (R&D) (Ensign & Hebert, 2004), and government (Britt, 2007). Although a myriad of KS research have been conducted but most of them focus on corporation activities (Cheng, Ho, & Pei, 2009) rather than academic institutions especially KS among students which poses main focus in this study.

Knowledge has been regarded as exclusive asset that differentiates individual with others. Because of that exclusiveness, individuals are reluctant to share it unless they get the benefits (Wu, Lin, Hsu, & Yeh, 2009). This situation also happens in classroom context where students would rather to hoard knowledge than share it to their fellows (Chen, Koch, Chung, & Lee, 2007). The barrier aforementioned can inhibit sharing knowledge which can help in mutual learning among students and increase the intellectual of students (Mustafa & Abubakar, 2009).

Studies have proved that KS relates to individual personality (e.g. Matzler, Renzl, Muller, Herting, & Mooradian, 2008; Wang & Yang, 2007; Fang & Liu, n.d.). Personality contributes to the diversity of human behaviors (Wang & Yang, 2007; Landers & Lounsbury, 2006). Only a few studies investigate personality along with KS among students (e.g. Teh et al., 2011; Chang, 2006).

KS is established through social interaction between knowledge giver and knowledge recipient (Chen et al., 2007). In order to make KS become successful in classroom, students are required to trust one another because student's decision to share his/her personal knowledge is dependent on trust (Tan, Lim, & Ng, 2009; Sue, Young, & Heeseok, 2008). A lot of studies have investigated interpersonal trust within groups and individuals (e.g. Karkoulian & Osman, 2009; Lewis & Weigert, 1985; Rotter, 1971) but unfortunately only few scholars were focusing their researches on the affiliation of interpersonal trust and personality traits which are vital for KS. One of them is Karkoulian and Osman (2009) who have studied it in business organization.

The discussion above has mentioned the shortcoming of KS studies in academic institution especially KS among students. This study is hoped can supplement the repository of KS researches in institution of higher education.

2. LITERATURE REVIEW

Knowledge Sharing (KS)

KS can be defined as a team process because KS entangles interaction and communication among team members (Nguyen & Kren, 2009; Cohen & Bailey, 1997). The success of KM is influenced by KS (Sheng & Noe, 2010) because one of purposes in building KM is to encourage KS among and between groups and individuals in organisation (Nguyen & Kren, 2009; Kubo, Saka, & Wilson, 2001).

KS has brought many benefits to organisation such as it helps in reducing production costs, completing new product development projects faster, increasing team performance, enhancing firm innovation capabilities, and stepping up firm performance including sales growth and revenue from new products and services (Sheng & Noe, 2010; Mesmer-Magnus & DeChurch, 2009; Lin, 2007b; Collins & Smith, 2006; Arthur & Huntley, 2005; Cummings, 2004; Hansen, 2002).

Because of the benefits that can be gained from KS, a lot of organisations decided to invest time and money into KM by developing knowledge management systems (KMS) which use technology both hardware and software to facilitate capture, storage and dissemination of knowledge (Sheng & Noe, 2010).

Although KS brings considerable benefits to organisations, it is not easy to access knowledge because most knowledge still remains in the head of people or in documents or databases that are not readily accessible to others (Riege, 2005). Besides that, organisations have not implemented KS well because they try to adjust their organisational culture to suit with KS goals, not implementing KS to fit their culture (Riege, 2005).

KS can happen through many ways/activities such as written correspondence or face-to-face communications with experts or documenting, organizing and capturing knowledge for others (Sheng & Noe, 2010; Cummings, 2004).

Table 1. Examples of How KS Can Take Place (Source: Jacobs & Roodt, 2007; Nguyen & Kren, 2009)

Authors	KS Activities
Gupta et al., 2000	workshops, seminars, conferences, team building exercises
Gupta et al., 2000	written reports
Dixon in Chua, 2003	through face-to-face interaction
Yang and Wan, 2004	informal gatherings, dialogues, social events, collective reflections

Husted and Michailova, 2002; Yang and Wan, 2004	Training
Bartol and Srivastava, 2002	conventional employee suggestion programmes
Bartol and Srivastava, 2002	periodic meetings across teams/work units
Bartol and Srivastava, 2002; McDermott and O'Dell, 2001	best practices
Bartol and Srivastava, 2002; McDermott and O'Dell, 2001	performance appraisal, merit pay, promotions
Gupta et al., 2000; Yang and Wan, 2004	mentoring programmer

There are many factors that influence the occurrence of KS. Riege (2005) categorized those factors into three groups: individual, organisational, and technological factors. Table 2 shows factors that influence KS from past studies.

Table 2. Factors Influencing KS (Source: Srivastave, 2001; Ding, 2007)

Researcher	**Factors**
Stasser, Stewart and Wittenbaum (1995); Stasser, Vaughan and Stewart (2000)	Diversity of expertise
Okhuysen and Eisenhardt (2000); Schwenk (1990)	Cognitive conflict
Gruenfeld et al. (1996)	Interpersonal familiarity
Lewis (1999)	Quality of team member exchange
Madhavan and Grover (1998); Pan and Scarborough (1998); Holste (2003)	Trust
Dennis et al. (1999); Gallupe and Bastianutti (1991); Lam and Schaubroeck (2000); Valacich, Dennis and Nunamaker (1992)	Group decision support systems
Stasser and Stewart (1992)	Task: demonstrability of correctness of response
Srivastave (2001)	Team efficacy; leadership behaviors; incentives
Diehl and Stroebe (1987, 1991); Karau and Williams (1993)	Social loafing
Grise and Gallupe (2000)	Cognitive overload
Esser (1998); Janis (1972, 1982); Janis and Mann (1977)	Norms for consensus
Taylor and Wright (2004)	Open leadership climate; learning from failure; information quality; performance orientation; satisfaction with change process; a vision for change

Knowledge transfer and knowledge exchange have been used interchangeably with KS. In fact, knowledge transfer and knowledge exchange are different with KS. Knowledge transfer is usually used to describe the shifting of knowledge between departments or organisations rather than individuals (Sheng & Noe, 2010; Szulanski, Cappetta, & Jensen, 2004). Knowledge transfer appears when there is sharing knowledge by contributor as well as adaptation of knowledge by receiver (Singh & Premarajan, 2007; Kurtzberg & Darr, 2000) whilst knowledge exchange involves both KS (employees who provide knowledge to others) and knowledge seeking (employees who search knowledge from others) (Sheng & Noe, 2010).

In a study by Sheng and Noe (2010), they reviewed seventy-six qualitative and quantitative studies of KS from 1999 until 2008. The review also includes three studies published before 1999. They came out with a framework of KS research that describes five emphasis areas of KS research, the topics in each area that have been explored, and the relationship between each area and KS.

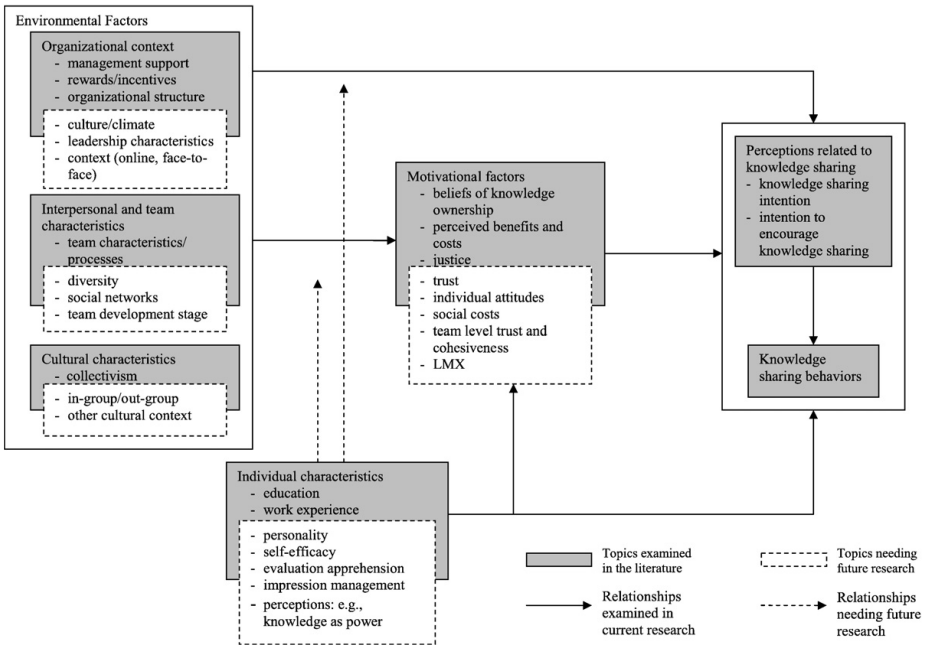

Figure 1. A framework of KS research (Source: Sheng & Noe, 2010)

KS in higher education institutions (HEIs)

Many studies have been conducted about KS but unfortunately those studies only focused on organisations or companies. Only a little few studies about KS in education institutions (Majid & Sim, 2009). Inspite of the differences between education institutions and organisations or companies, KS is regarded as essential for the learning process (Majid & Sim, 2009).

KS plays important role in HEIs because HEIs are regarded as knowledge-based organisations and most of employees who work in universities are knowledge workers (Jain, Sandhu, & Sidhu, 2007). Universities as HEIs are source of knowledge have responsibility to manage, blend, provide, and share knowledge. Universities in developed country have implemented KM practices, that is a proof that KS holds a key role in HEIs (Sohail & Salina, 2009).

Attitude towards KS is influenced by education level (Yaghi, Barakat, Alfawaer, Shkokani, & Nassuora, 2011). There is no relationship between education level and KS behavior on software development teams (Aamir, Mohd, Mazeyanti, Mobashar, 2009; Ojha, 2003) but it is feasible to be debated that a high-educated person tends to share knowledge because s/he has considerable knowledge (Aamir et al., 2009).

HEIs have been known as a place to produce new knowledge in the form of research papers or publication (Buckley & Giannakopoulos, 2011a). Novel knowledge is one shape of innovation (Collinge, Burfitt, & MacNeill, 2006). Innovation is substantial for university to be an active player in market and it can become university's competitive edge to compete with other universities. Sharing knowledge increases one's exposure to different ideas (Omerzel, Biloslavo, & Trnavcevic, 2011) and ultimately can foster innovation process and escalate the quality of innovation (Yaghi et al., 2011). An, Qiao, and Chen (2004) dubbed KS as knowledge innovation because individual needs to add his/her comprehension when sharing knowledge.

One of the missions of HEIs is creating, transforming, and transmitting knowledge (Omerzel et al., 2011; Laudon and Laudon, 1999). Because of the fast development of knowledge, HEIs should respond rapidly to the dynamic environment in order to survive (Omerzel et al., 2011) by keeping learning. Unfortunately, many HEIs provide formal learning to supplement knowledge to their human resources (Buckley & Giannakopoulos, 2011a). Buckley and Giannakopoulos (2011a) suggested that universities should provide informal learning rather than formal learning because employees can learn much from the former.

Few researchers noted that it is difficult and challenging to manage knowledge in HEIs (e.g. Buckley & Giannakopoulos, 2011b; Omerzel et al., 2011; Tippins, 2003). Tippins (2003) pointed to bureaucratic and cultural factors as inhibitors. Other inhibitors such as lack of social interaction and interest (Omerzel et al., 2011). Flexible HEIs are more ready to implement KS than bureaucratic HEIs (Jain et al., 2007). Yaghi et al. (2011) found that HEIs' culture influences employees' KS behavior. Knowledge (tacit and explicit) resides in people's mind and it becomes difficult to manage academics' knowledge (Buckley & Giannakopoulos, 2011b). Managing knowledge must become top priority by universities leader because universities' intellectual capital depends on tacit knowledge that the academics own (Jain et al., 2007).

HEIs are closely related to the development of intellectual capital (Maksimova & Tikhomirova, 2010). Intellectual capital is a mix of intangible assets which drive the company (Maksimova & Tikhomirova, 2010; Brooking, 1996). Intellectual capital is like a university's lever because it preserves competitive advantage and continuous performance of institutions (Nazem, 2011). Intellectual capital of HEIs is a published scholarly material such as "articles", "journal papers published", "case studies", "books compiled", etc (Hassandoust, 2010).

Intellectual capital is a combination of human capital, relational/customer capital, and structural capital (Atalay & Anafarta, 2011; Bontis, 1998). Human capital is an engine of intellectual capital (Maksimova & Tikhomirova, 2010). Atalay and Anafarta (2011); Bontis, Chua, and Richardson (2000); Webster (2000) mentioned human capital as a seed of innovation. Human capital of academics consists of a bunch of knowledge, experiences, skills, and know-how in research and teaching activity (Maksimova & Tikhomirova, 2010). Trust is a key factor in KS that enhances human capital (Zadjabbari & Wongthongtham, 2009). Zadjabbari and Wongthongtham (2009); Sveiby (2002) mentioned that trust is vital for KS and suggested method of improving trust by conducting meeting among academics to construct dialog and create cozy working environment.

Maksimova and Tikhomirova (2010) suggested that university leader must encourage academics to participate in establishing intellective capital of students and preserve as well as step up their intellectual capital.

KS among Academics

Jain et al. (2007) in his research studying KS activities among academics in Malaysian Universities found that the academics felt that KS is essential in academic environment. The researchers also recommended that support is needed from top management such as reward and performance appraisal to encourage academics to spread their personal knowledge because they found the barriers that inhibited KS among academics are the lack of rewards and recognition, lack of time, and lack of formal and informal activities to encourage KS. Interestingly, communication skills and lack of IT systems that pose barriers to KS (Riege, 2005) did not prove in their research. It is because one who involved in teaching and research activities are persevering to tell others about his/her work as well as to listen the feedback or other works given by them (Kenway, Epstein, & Boden, 2005).

Sohail and Salina (2009) found that nature of knowledge, working culture, staff attitude, motivation to share, and opportunities to share as factors to enhance KS among academics. Based on their findings, the relationship between KS and aforementioned five factors only happened in public universities in Malaysia, not in private universities. Contrast with research by Jain et al. (2007), Sohail and Salina (2007) found that non-monetary rewards are less effective to motivate academics to share knowledge but according to Azlyn, Zaherawati, Nur, Nazni, Mohd, Natrah, & Nurul (2011), both monetary and non-monetary incentives are crucial in fostering KS.

Sohail and Salina (2009) recommended open discussions, forums, seminars or colloquiums as activities to encourage academics to share knowledge. The university infrastructure including databases must be upgraded to support KS practices (Sohail & Salina, 2009). Sohail and Salina (2009) pointed culture as important factor in KS rather than technology. The portion in KM community consists of 80% is people and culture, and the rest is technology (Sirajuddin, Ahmad, & Rose, 2006).

In his paper titled "Knowledge Sharing Culture in Malaysian Public Institution of Higher Education (PIHE): An Overview", Sirajuddin et al. (2006) found that incentives, job assessment, and promotion as motivation to participate in KS. Although academics cannot directly get the feedback such as advancement or other pecuniary payoff, if the university admits the importance of KS as a part of its culture, the academics can be motivated to share their knowledge (Cheng et al., 2009).

There are many ways to share knowledge among academics. One of them is through communities of practice (CoP) (Buckley & Giannakopoulos, 2011b; Wenger, 2004). CoP comprise of people who come together voluntary (Buckley & Giannakopoulos, 2011b) and are willing to share their interest, competencies, and activities (Buckley & Giannakopoulos, 2011b; Wenger, 2006). CoP have three characteristics: domain, community, and practice (Buckley & Giannakopoulos, 2011b; Witt, McDermott, Peters, & Stone, 2007; Wenger, 2004). The domain is the field of interest, the community is a group of people which formed by rapport between members, usually built by conversation and discussion, the practice is what the community members will do with knowledge they get from interaction (Buckley & Giannakopoulos, 2011b; Witt et al., 2007).

Although CoP are important in implementing KM (Sirajuddin et al., 2006), KS within CoP encounters challenges: lack of trust, lack of incentives, and poor culture of learning in HEIs (Buckley & Giannakopoulos, 2011b). Building trust in HEIs is challenging and not easy. In order to cultivate trust in HEIs, the leaders of institution should be trustworthy and they must act with integrity (Buckley & Giannakopoulos, 2011b).

Buckley and Giannakopoulos (2011b) described four stages to build trust in HEIs. The first stage is to build rapport among academics by establishing groups and meetings so they can learn from each other. The second stage is to encourage academics to look outwards towards their associates by using techniques such as storytelling and learning conversations. The third stage is top management should build infrastructure to facilitate academics to access information easily and fast. Infrastructure includes applying collaborative tools such as chat rooms and online communities. The last stage is acknowledgement of top management to academics who involve in KS activity. The acknowledgement can be a scorecard to note the contribution from academics.

CoP are always changeful and contain dynamic entities because as time passes, it is possible that old members leave the community and new members join in (Roberts, 2006). Roberts (2006) also stated that CoP consist of various members who have differences one another in "experience", "expertise", "age", "personality", and "authority" inside the institution.

CoP have been claimed could help in sharing and articulating tacit knowledge (McDonald & Star, 2008; Callahan, n.d.). There are five ways to manage tacit knowledge through CoP. First, the groups augment the context based on their area of interest. Secondly, the raising interaction along with the augmented context aforementioned

empowers members to respond fast to uncommon and unforeseeable inquiries. Thirdly, the CoP contain a bunch of expertise that members can grab so through the active participation, tacit knowledge could be shared. Fourthly, through fostering intuitive perceiving by committing works, mirroring, inquiring question, and listening to the narration of other members. The last is new members are granted access to link with knowledgeable and elder members.

Sirajuddin et al. (2006) proposed CoP framework for Malaysian PIHE. The framework consists of internal and external communities. Internal communities comprise of top management, academics, postgraduate students (coursework and research), supporting staffs, etc. Each community has its contribution to KM practices in accordance with its role (Sirajuddin et al., 2006). The external communities comprise of lecturers and students in other universities such as private universities and other foreign universities and invidual in other agencies outside PIHE like government, other organisations that are interested in education (Sirajuddin et al., 2006).

Many researchers have stated that technology alone cannot encourage people to share knowledge (e.g. Cheng et al., 2009; Brazelton & Gorry, 2003; Hendricks, 1999) but technology itself can be mediating factor in KS (Cheng et al., 2009). The usage of electronic collaboration (e-collaboration) tools such as blogs, wikis, portals, groupware, discussion boards, and instanst messaging (Fichter, 2005) to communicate among academics can help to capture the intellectual capital and improve KS (Hassandoust, 2010).

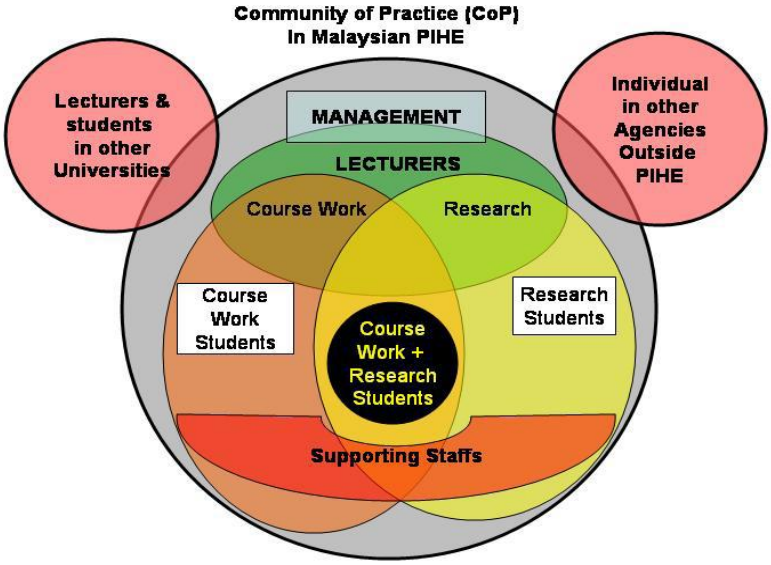

Figure 2. CoP in Malaysian PIHE (Source: Sirajuddin et al., 2006)

Although technology can reduce barriers and enhance the tendency to share knowledge (Cheng et al., 2009), the implementation of KS always depends on people and it cannot ever be substituted by technology. This reality can be seen in implementation of KM Portal in Multimedia University (MMU), a private university in Malaysia.

MMU introduced ShareNet, online sharing system (Cheng et al., 2009) to promote KS among MMU's academics. Eventhough management of MMU obligated all academics to share their information or knowledge on ShareNet, there was no interest of employees to participate on ShareNet. The management did not provide incentives to staffs who contributed their knowledge on ShareNet (Chua & Maizatul, n.d.). Cheng et al. (2009) found that incentive systems can be a driver to encourage KS. The lack of confidence on the quality information published on ShareNet as well as the web design was not user-friendly are the reasons academics were reluctant to participate on ShareNet (Cheng et al., 2009).

Figure 3. MMU ShareNet (Source: Chua & Maizatul, n.d.)

KS among Students

Sharing knowledge between tertiary students can intercalate invidual's learning and wisdom (Rehman, Bin Dost, Ahmed, & Khan, 2010). The process of KS and its application contributes to the students' learning (Yu, 2006). Students can learn something new, solve problems, answer questions, and increase comprehension in particular subject when they exchange knowledge with their peers (Rehman et al., 2010). The exhanging knowledge can be tacit knowledge (e.g. skills or competencies) and explicit knowledge (e.g. notes or documents) (Ting & Majid, 2006). The success of knowledge transfer depends on continual learning interactions rather than just communication (Yu, 2006; Szulanski, 2000).

The successful implementation of collaboration learning in classroom has proved that it is a powerful learning method (Rehman et al., 2010; Brown & Palincsar, 1989). Collaborative learning has been known can increase studens' learning process. Collaborative learning is an instruction method of grouping students together with a purpose to make them work together in particular task (Turner, 2007; Laatsch, Britton, Keating, Kirchner, Lehman, Madsen-Myers, Milson, Otto, & Spence, 2005; Cabrera, Nora, Crissman, & Terenzini, 2002). This learning style has brought many benefits to students such as academic achievement, communication skill, teamwork, and KS (Ting & Majid, 2006; Emmer & Gerwels, 2002).

Collaborative learning helps to fill the gap among students by sharing knowledge from student who has particular knowledge to student who needs that knowledge. Because of that, collaborative learning can be said as supplement of students' deficient expertise (Chiu, 2010). Collaborative learning is badly dependent on KS between students (Chiu, 2010). Sharing knowledge should be done voluntarily among students (Ting & Majid, 2006).

Many HEIs require their academics to involve discussions, group projects, and other collaborative activities in class (Majid & Sim, 2009; Grantham, 2005). Research showed that KS during collaborative learning effects students' reflection and learning (Walker, 2002 as cited in Ting & Majid, 2006).

Despite positive impacts of collaborative learning, in certain topic or issue students will not share their knowledge to their peers (Ting & Majid, 2006). It is caused by physical, technological, psychological, personality, and cultural factors (Ting & Majid, 2006; Riege, 2005; Yu, Fulk, Shumate, Monge, Bryant, & Matsaganis, 2005). Chiu (2010) contended that when students involve in a competition, they will regard personal knowledge as a critical resource for their performance so they will be averse to share it.

The research result from few studies showed that the students are willing to share knowledge. Yaghi et al. (2011) found that most of the students felt that KS among students will benefit all through sharing notes, presentation slides,etc. Another research by Ting & Majid (2006) found that students exhibit positive behavior towards KS and consider KS is important in peer learning.

Factors Influencing KS among Students

Factors that influence KS can be divided into positive and negative factors but negative factors usually are called as barriers (Jain et al., 2007). In this part, the researcher will discuss positive factors that influence KS among students.

Wangpipatwong (2009) found that technology support and student's ability to share influence KS among university students both undergraduate and graduate students. Technology enables long distance collaboration between students (Wangpipatwong, 2009). Ability to share relates to the way that student store and process

information (van den Hooff, Elving, Meeuwsen, & Dumoulin, n.d.).

A lot of studies have mentioned that motivation is one of factors that affect KS (e.g. Susanty & Wood, 2011; Galia, 2008). Research done by Majid and Sim (2009) found that motivation factor encourages KS among graduate students. They motivated to share because they wanted to set up the relationships with other students and improved understanding about particular subject that was taught in class. Different motivation was found in undergraduate students. Ting and Majid (2006) found that motivation such as learning from each other and helping others influence KS among undergraduate students.

Study by Mustafa and Abubakar (2009) found that student learning culture and the usage of IT affect student KS. Learning culture promotes and encourages the ongoing process of learning for organisation and its members (Mustafa & Abubakar, 2009; Johnston & Hawke, 2002). KS is a key to a learning culture (Chinowsky & Carrillo, 2007). Similar to the finding by Mustafa and Abubakar (2009), Majid and Sim (2009) found that graduate students prefer to use e-mail as a communication channel to share KS with their peers but the undergraduate students prefer face-to-face to IT tools as communication channel (Ting & Majid, 2006).

Regarding the role of IT in KS is still debated (Mohamed, Stankosky, & Murray, 2006). There are studies (e.g. McDermott & O'Dell, 2001) which state that the success of KM initiatives does not depend on IT tools whereas the studies by Duffy (2000) and Lang (2001) mentioned that IT is essential needed for global reach. IT is regarded as one of four pillars to form KMS besides organisation, learning, and leadership (Stankosky & Baldanza, 2000 as cited in Mohamed et al., 2006). Davenport & Prusak (1998) said that *techknowledgy* (the term for knowledge technologies) is a part of KM. Regardless of whether IT could benefit KS or not, Davenport and Prusak (1998) stated that technology alone cannot make the employee with expertise to share with others as well as technology cannot make the employees who is not interested in seeking knowledge to utilize the internet for searching. Similar as being said by Stankosky and Baldanza (2000), Davenport and Prusak (1998) mentioned that technology must be accompanied by extensive behavioral, cultural, and organisational change in order to create effective KM.

Barriers that Inhibit KS among Students

Ting and Majid (2006) found that competition among students to outperform their fellow students and lack of depth in peer relationship are two main factors that inhibited KS among students. They also found that the lack of reciprocity in sharing, apprehension to be perceived as a show-off, and the fear of providing wrong information are other inhibitors. Ting and Majid (2006) suggested that universities should organize informal social events to strengthen the relationship among students and lecturers should involve much more collaborative learning to avoid unnecessary competition among students. Collaborative learning entails the building of new knowledge, composed together, and thus shared by the students (Stahl & Hesse, 2009). "Collaborative learning is all about sharing knowledge" (Stahl & Hesse, 2009, p. 365).

Wangpipatwong (2009) also found that the degree of competition inhibits KS among students. Similar to Ting and Majid (2006), she said the reduction of competition in classroom can enhance KS. When students consider their fellows as learning mates rather than competitors, they are more likely to engage in sharing their thoughts and knowledge (Ting & Majid, 2006).

Yaghi et al. (2011) found that the barriers that impede sharing knowledge among students are the lack of interaction between students who needs knowledge and students who provide knowledge; distrust among students; the students' belief that knowledge is power; and there is no system at the university to identify colleagues with whom students need to share knowledge with.

Barriers that described above are studies in undergraduate level. Majid and Sim (2009) found that main inhibitors to KS among graduate students are the lack of time and lack of depth in relationship. Other following inhibitors such as students only want to share with those who share with them and the lack of opportunities for face-to-face interaction with other students.

Trust

Many studies have stated that there is a relationship between trust and KS (e.g. Lin, 2007a; Riege, 2005; Davenport & Prusak, 1998; Levin, Cross, Abrams, & Lesser, n.d.). Davenport and Prusak (1998) believe that trust is vital prerequisite to enable knowledge market in organisation. Similar concept of market that sells goods and services, knowledge market involves buyer, broker, and seller. The transaction of buying/selling intangible asssets happens in knowledge market.

There are many definitio of trust that can be found in literature. Ding (2007) found that there are two reasons behind the disparate of definition of trust among researchers. The first is because of the different context of the researchers' study and the second is the general theoretical framework of trust has not been stipulated across different disciplines.

Table 3. Definitions of trust in literature (Source: Holste, 2003; Ding, 2007)

Researcher	Definition
Deutsch (1958)	An individual may be said to have trust in the occurrence of an event if he expectits occurrence and the expectations lead to behavior which he perceives to have greater negative motivational consequence if the expectation is not confirmed than positive motivational consequence if it is confirmed.
Rotter (1967)	Trust is defined as an expectancy held by an individual or group that the word, promise, verbal or written statement of another individual or group can be relied upon.
Schlenker, Helm and Tedeschi (1973)	Interpersonal trust may be defined as reliance upon information received from another person about uncertain environmental states and their accompanying outcomes in a risky situation.
Garbarro (1978)	Trust is the extent to which one person can expect predictability in the other's behavior in terms of what is 'normally' expected of a person acting in good faith.
Larzelere and Huston (1980)	Trust is most generally defined as a belief by a person in the integrity of another individual.
Lewis and Weigert (1985)	Trust exists in a social system insofar as the members of the system act according to and are secure in the expected futures constituted by the presence of each other or their symbolic representation
Remple et al. (1985)	Trust is feelings of confidence and security in the caring responses of the partner and the strength of the relationship.
Zucker (1986)	A set of expectations shared by all those involved in an exchange.
Boon and Holmes (1991)	A state involving confident expectations about another's motives with respect to oneself in situations entailing risk.
Moorman, Zaltman, and Deshpande (1992)	Trust is a willingness to rely on an exchange partner in whom one has and confidence.
Fukuyama (1995)	The expectation that arises within a community of regular, honest, and cooperative behavior, based on commonly shared norms, on the part of other members of that community.
Hosmer (1995)	Trust is the expectation by one person, group or firm of ethically justifiable behavior – that is, morally correct decisions and actions based upon ethical principles of analysis – on the part of the other person, group, or firm in a joint endeavor or economic exchange.
Mayer and Davis (1995)	Trust is the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party.
McAllister (1995)	Trust is the extent to which a person is confident in, and willing to act on the basis of the words, actions, and decisions of another.
Cummings and Bromily (1996)	An individual's belief or a common belief among a group of individuals that another individual or group (a) makes good-faith efforts to behave in accordance with any commitments both explicit or implicit, (b) is honest in whatever negotiations preceded such commitments, and (c) does not take excessive advantage of another even when the opportunity is available.
Mishra (1996)	Trust is one party's willingness to be vulnerable to another party based on the belief that the latter party is (a) competent, (b) open, (c) concerned, and (d) reliable.

Trust exists when individuals feels that their co-workers are trustworthy and the co-workers will reciprocate the same attitude like they share knowledge with them (Lin, 2007a). Trustees are more feasible to contribute when they feel trusted, and trustors are more feasible to trust when they have proof that their co-workers/partners are trustworthy (Evans, & Revelle, 2008). Trust expands and motivates employees in creating organisation's KS culture (Tan, Lim, & Ng, 2009). Trust plays a key role in specifying the sharing and adaptation of knowledge (Singh & Premarajan, 2007).

Finding by Levin et al. (n.d.) states that it is trust not strong ties that contributes to effective KS. They found that although there isweak ties between individuals, trust still can be developed because weak ties individuals are feasible to connect to heterogenous social networks and are easy to be opened to distinct types of knowledge and ideas. They also explained that individuals with strong ties usually have the same kind of knowledge (ideas or

concepts). Nevertheless, Lin (2007a) said that individuals who have close relationship with co-workers are more likely to generate trust.

Manev and Stevenson (2001) divided social network ties into two kinds: instrumental ties and expressive ties (Lin, 2007a). Instrumental relationship is a workplace partnership. It appears in a teamwork/group where

individuals want to achieve the same goals/benefits whilst exppresive ties appears in friendship between individuals with their co-workers.

Davenport and Prusak (1998) proposed three ways to establish trust: trust must be visible, trust must be ubiquitous, and trustworthiness must start at the top. Trust must be visible means the employee should get reward if s/he involves in KS. Trust must be ubiquitous implies the all parties who involve in knowledge market must be trustworthy. Trustworthiness must start at the top means trust must be flowed from top management downward through organisation.

Levin et al. (n.d.) suggested three steps to build trust among employees: create a common understanding of how the business works, demonstrate trust-building behaviors, and bring people together. The first step can be executed by establishing a shared view to employees of how work gets completed, how it is measured and rewarded. Trust-building behaviors such as receptivity and discretion can be built if management uses active listening skills and encourages employees to express their complaint, concern, and opinion regarding issues about themselves or company. The last step can be achieved if management creates both physical and virtual space to allow interaction among employees.

Besides the positive impact of trust towards KS, trust also brings a lot of benefits to organisational success as shown in table 4.

Table 4. The benefits of trust to organisation (Source: United States Department of Forest Service, & United States Department of Interior Bureau of Land Management, 2005)

Benefit	Example
Better project outcomes in terms of quality, time or budget.	"We came up with a better product because we were willing to challenge each other's assumptions and clarify our thinking."
Effective delegation.	"I was able to empower him more so I could disengage and not be directly involved."
Better decision making.	"We could share control and make better decisions. There wasn't a need for checks and balances."

Previous studies found that there are four factors used by knowledge seeker to assess the the trustworthiness of a knowledge source as shown in figure. Knowledge seeker uses one or more factors to determine whether knowledge source can be trustworthy.

Factor	Rationale	Attributes examined
Demographic similarity	Many business and communication experts have highlighted the importance of similar characteristics in fostering communication and the development of trust.	• Gender • Age
Organizational similarity	Elements of organization design, such as formal structure, HR practices and governance are likely to have a direct effect on trust in organizations.	• Similar job function • Close physical proximity • Worked on same project • Relative position in hierarchy
Social capital	Recent studies have suggested that the presence of an ongoing relationship between individuals has an impact on trust and knowledge sharing.	• Strong ties between the knowledge seeker and knowledge source • Shared vision and goals • Shared language and terminology
Knowledge source	The actions of the knowledge source can influence the knowledge seekers decision to trust that person.	• Availability (Does the knowledge source have free time and attention to devote to the knowledge seeker?) • Discretion (Is the knowledge source able to respect confidentiality?) • Receptivity (Is the knowledge source a good listener?)

Figure 4. Potential attributes that influence a knowledge seeker's decision to trust a knowledge source (Source: IBM Institute for Knowledge-Based Organizations as cited in Levin et al., n.d.)

Types of Trust

The categorization of trust is based on discipline field such as psychology, economy, and sociology (Dignum & van Eijk, n.d.). From psychology research, Kramer (1999) categorizes trust into dispositional trust, history-based trust, third parties as conduits of trust, category-based trust, role-based trust, and rule-based trust (Ding, 2007). In economy research, Shapiro, Sheppard and Cheraskin (1992) differentiate trust into deterrence-based, knowledge-based, and identification-based trust (Evans, 2010). Lewicki and Bunker (1995; 1996) also contributes in economy field by expanding the work of Shapiro et al. (1992). Lewicki and Bunker (1995; 1996) said that three types of trust that were proposed by Shapiro et al. (1992) are connecting each other. The accomplishment of trust at one level will lead to the development of trust at the next level (Evans, 2010; Lewicki & Bunker, 1996). They changed deterrence-based trust become calculus-based trust. Lewicki and Bunker (1995; 1996) call the stages of trust development as *the stagewise evolution of trust* (Evans, 2010). From sociological research, trust can be divided into dispositional or personality-based trust, interpersonal trust, and impersonal or institutional trust (Dignum & van Eijk, n.d.).

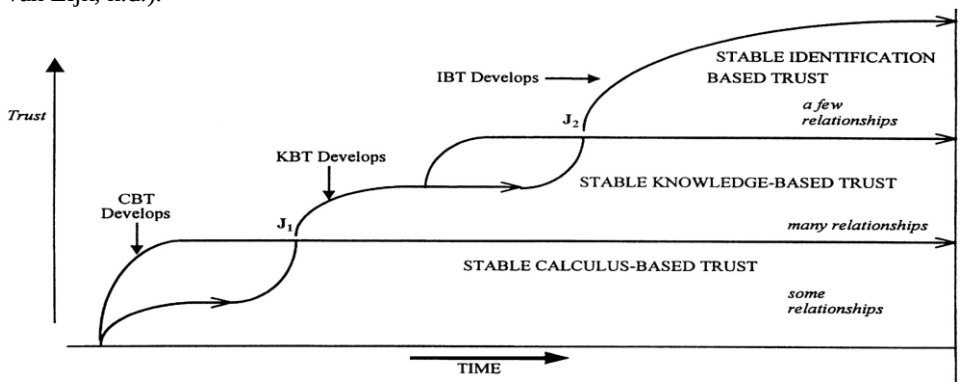

Figure 5. Lewicki and Bunker's Stages of Trust Development (Source: Lewicki & Bunker, 1996; Evans, 2010)

Factors of Trustworthiness

Trust occurs when there is involment of two parties: trustor (the trusting party who is knowledge seeker) and trustee (the party to be trusted who is knowledge source). The personality trait of trustors determines how much they are trusting trustees. Mayer et al. (1995) call it as trustor's propensity in their proposed model of organisational trust as shown in figure 2.6. Propensity will influence one's trust to other parties prior to data are available regarding to those parties (Mayer et al., 1995). People's personality to trust are influenced by various developmental experiences, personality types, and cultural backgrounds (Hofstede, 1980; Mayer et al., 1995). By understanding the propensity to trust of trustors, we can know why there are parties that are more likely to trust than others but a trustor also has different level of trust for distinct trustees (Mayer et al., 1995). Mayer et al. (1995) said that because of the variance of characteristics of trustees causes a trustor has a greater or lesser amount of trust for another trustee.

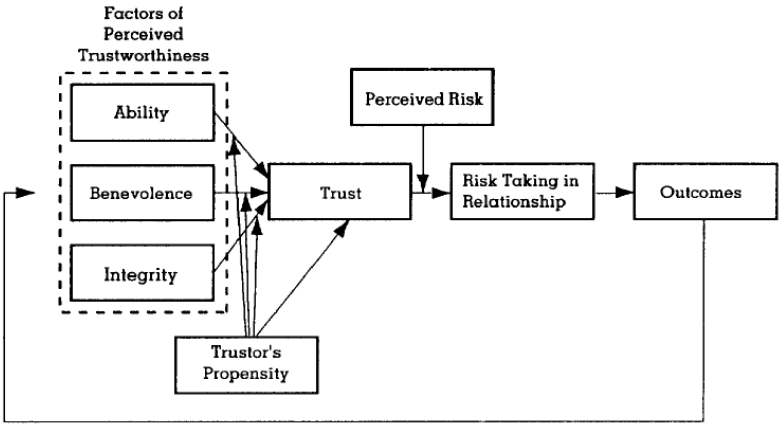

Figure 6. Proposed model of trust (Source: Mayer et al., 1995)

Hovland, Janis, and Kelley (1953); Lieberman (1981); Johnson-George and Swap (1982); Good (1988) have suggested that characteristics and deeds of the trustee will dispose s/he to be more or less trusted (Mayer et al., 1995). Many researchers have proposed various characteristics of trustee (also called antecedent factors of trust) that are responsible for trust (Mayer et al., 1995) as shown in figure 2.7. From a lot of those factors, Mayer et al. (1995) notice that three factors always appear from past studies. Mayer et al. (1995) called three factors:

ability, benevolence, and integrity as the factors of perceived trustworthiness. Perceived trustworthiness is the quality of the trustee's characteristics that makes the trustor willing to be vulnerable (Levin, Cross, & Abrams, 2002). The three components of trust from Mayer et al.'s (1995) work have been often as cited in many studies (e.g. Nguyen & Kreng, 2009; Ling et al., 2009; Usoro, Sharratt, Tsui, & Shekhar, 2007). Those three variables help to build the groundwork for the development of trust (Mayer et al., 1995). Studies found that variable integrity does not influence both strong-ties and weak-ties relationship (e.g. US Department of Forest Service, & US Department of Interior Bureau of Land Management, 2005; Levin et al., 2002; Levin et al., n.d.). Conversely, Dignum and van Eijk (n.d.) mentioned that competence and integrity are needed in human relationship.

Table 5. Trust antecedents (Source: Mayer et al., 1995)

Authors	Antecedent Factors
Boyle & Bonacich (1970)	Past interactions, index of caution based on prisoners' dilemma outcomes
Butler (1991)	Availability, competence, consistency, discreetness, fairness, integrity, loyalty, openness, promise fulfillment, receptivity
Cook & Wall (1980)	Trustworthy intentions, ability
Dasgupta (1988)	Credible threat of punishment, credibility of promises
Deutsch (1960)	Ability, intention to produce
Farris, Senner, & Butterfield (1973)	Openness, ownership of feelings, experimentation with new behavior, group norms
Frost, Stimpson, & Maughan (1978)	Dependence on trustee, altruism
Gabarro (1978)	Openness, previous outcomes
Giffin (1967)	Expertness, reliability as information source, intentions, dynamism, personal attraction, reputation
Good (1988)	Ability, intention, trustees' claims about how (they) will behave
Hart, Capps, Cangemi, & Caillouet (1986)	Openness/congruity, shared values, autonomy/feedback
Hovland, Janis, & Kelley (1953)	Expertise, motivation to lie
Johnson-George & Swap (1982)	Reliability
Jones, James, & Bruni (1975)	Ability, behavior is relevant to the individual's needs and desires
Kee & Knox (1970)	Competence, motives
Larzelere & Huston (1980)	Benevolence, honesty
Lieberman (1981)	Competence, integrity
Mishra (In press)	Competence, openness, caring, reliability
Ring & Van de Ven (1992)	Moral integrity, goodwill
Rosen & Jerdee (1977)	Judgment or competence, group goals
Sitkin & Roth (1993)	Ability, value congruence
Solomon (1960)	Benevolence
Strickland (1958)	Benevolence

Research by IBM Institute of Knowledge-Based Organizations found that knowledge seekers consider several factors to determine whether knowledge sources are trusthworthy depend on the type of trust (competence-based trust or benevolence-based trust). Three factors are used in determining competence-based trust: common language, common vision, and discretion whereas five factors are needed for benevolence-based trust: three factors are same as those of competence-based trust and the rest are receptivity and strong ties (Levin et al., n.d.).

Attribute	Definition	Significant impact on competence-based trust	Significant impact on benevolence-based trust
Common language	The extent to which the knowledge source and seeker understand each other and use similar jargon and terminology	Yes	Yes
Common vision	The extent to which a knowledge source and seeker have shared goals, concerns and purpose	Yes	Yes
Discretion	The extent to which the knowledge source is viewed as keeping sensitive source information confidential	Yes	Yes
Receptivity	The extent to which the knowledge source is a good listener	No	Yes
Strong ties	The extent to which the knowledge seeker and source converse frequently with each other and have a close relationship	No	Yes

Figure 7. Significant attributes that influence a knowledge seeker's decision to trust a knowledge source (Source: IBM Institute for Knowledge-Based Organizations as cited in Levin et al., n.d.)

Benevolence-based Trust

Benevolence is the condition in which the trustee wants to do a good thing to the trustor. Benevolence-based trust relates to the perception in which the trustee would care the trustor's interests and goals. Mayer et al. (1995) illustrated benevolence of the trustee towards the trustor like the relationship between a mentor and a protege. The mentor (trustee) has initiative to help the protege (trustor) eventhough the mentor is not needed to help and there is no extrinsic reward for the mentor (Mayer et al., 1995).

Benevolence-based trust has been found to be essential in both tacit and explicit knowledge exchanges (Levin et al., n.d.). A benevolent community is believed can encourage the participation and development of its members (Usoro et al., 2007; Sharratt & Usoro, 2003). Usoro et al. (2007) found that one's degree of trust in the benevolence of a community is positively related to one's engagement in KS with the community. The authors also mentioned that if the member's sense of community is low then the future reciprocity will be low too and eventually that condition will inhibit KS.

Benevolence can overcome the fear of one's losing face because of giving the fallacious contribution or one's contribution is lacking of relevance (Sharratt & Usoro, 2003) by creating the confidence that the contributor will not be criticised or humiliated when sharing knowledge (Usoro et al., 2007). Benevolence-based trust enables one to question his/her colleague without feeling it can lower one's self-esteem or reputation (Sharratt & Usoro, 2003).

Ability/Competence-based Trust

Competence-based trust is the trust of knowledge seeker towards the knowledge source because of the knowledge source's competences or skills in specific area. When the knowledge required is difficult to be codified (tacit knowledge), the knowledge seeker should have a large amount of competence-based trust towards the knowledge source (Levin et al., n.d.). In a nutshell, competence-base trust is required for sharing tacit knowledge (Levin et al., 2002; Levin et al., n.d.).

Usoro et al. (2007) found that there is a relationship between one's perception of the community's ability and engagement in KS. High level of competence-based trust could restrict one's willingness to share knowledge within the community, for instance if the perception of his/her competence is lower than the level of competence within community, it will trigger the negative of one's feeling such as embarrasing or fear to be criticized and ultimately it can discourage individual to share to other members (Usoro et al., 2007).

Usoro et al. (2007) suggested that the role of competence-based trust can be an enabler or barrier of member's participation in community. When the one's shared knowledge gets the consensual validation in community, it may encourage one's motivation to contribute more. Consensual validation can be in the form of recognition and confirmation that one is knowledgeable (Usoro et al., 2007). Whereas when the one's shared knowledge is regarded as low competence by other members in community, it can reduce the self-esteem of knowledge provider and obstruct someone to contribute in the future.

Integrity-based Trust

Integrity-based trust is the perception in which the trustee is bounded to the set of principles that can be accepted by the trustor (Mayer et al., 1995). There are several factors that can influence the establishment of integrity-based trust: the independence verification of the trustee's integrity from reliable third parties; perceptions that the trustee has a certain level of moral standard; and the consistency between trustee's words and actions (Usoro et al., 2007). Simon (2002) coined the term *behavioral integrity* for the conformity between trustee's words and actions (as cited in Usoro et al., 2007). Colquitt, Scott, and LePine (2007) mentioned that the trustees are said to have integrity if they have ethical fundamentals such as "fairness", "justice", "consistency", "promise fulfillment".

Perception of the past knowledge source's behavioral integrity creates confidence in future actions (Usoro et al., 2007). If one suspects other members' behavior is lacking of integrity because of dishonest or violation of moral standards, s/he is more likely not to participate in sharing his/her knowledge in community whereas s/he will be willingness to share knowledge in community that has higher perception towards behavioral realibility (Usoro et al., 2007).

Interpersonal trust

Many researchers have pointed out the importance of interpersonal trust (e.g. Siu, 2007; Goris, Vaught, & Pettit, 2003; Nyhan, 2000; Rich, 1997). Nguyen and Kreng (2009) emphasized that many studies have shown that interpersonal trust relates to many organisational variables such as the quality of communication (Muchinsky, 1977; Roberts & O'Reilly, 1974), performance (Earley, 1986), citizenship behavior (McAllister, 1995), problem solving (Zand, 1972), and cooperation (Axelrod, 1984). Moreover, interpersonal trust in the workplace also influences "job satisfaction", "stress", "organisational commitment", "productivity", and "KS" (Mooradian et al., 2006).

Whitener (2001) defined interpersonal trust as pertaining reciprocal faith in each other in form of intention

and behavior (Nguyen & Kreng, 2009). Mayer et al. (1995) defined interpersonal trust as the willingness of knowledge seeker (trustor) to be susceptible to the actions of knowledge source (trustee) based on the expectation that knowledge source will conduct a certain activity essential to knowledge seeker, heedless of the capability to oversee knowledge source.

Abrams et al. (2003) found that many trust-building behaviors and actions affect interpersonal trust. There are ten trust builders which are categorized into four groups namely trustworthy behaviors, organisational factors, relational factors, and individual factors. Trusthworthy behaviors consist of five trust builders: act with discretion, be consistent between word and deed, ensure frequent and rich communication, engage in collaborative communication, and ensure that decisions are fair and transparent. Organisational factors consist of two trust builders: establish and ensure shared vision and language, and hold people accountable for trust. Relational factors consist of two trust builders: create personal connections, and give away something of value whilst individual factors consist of one trust builder namely disclose your expertise and limitations.

Many studies have been conducted regarding interpersonal trust in company but according to Deshaw (2009) only five scholars who did research on trust in education institutions: Hoy and Tschannen-Moran (1999; 2003) focused the research on trust in elementary, middle, and high schools; Bryk and Schneider (2002) studied trust in elementary schools; Tierney (2006) did research on trust in higher education.

The Big Five Personality (BFP) Factors

Research showed that personality relates to the different types of human behaviors (e.g. Wang & Yang, 2007; Landers & Lounsbury, 2006). Many dimensions in personality have been proposed (Wang & Yang, 2007). One of those is the BFP factors. The BFP factors are the most widely used because they are overly stable (Karkoulian & Osman, 2009; Wang & Yang, 2007 ; Soldz & Vaillant, 1999; McCrae & Costa, 1994).

According to Luthans (2005), the BFP factors have been used in the area of organisational behavior and human resource management. The BFP dimensions influence the behavior and job performance of employees and can be used to predict the work behavior (Karkoulian & Osman, 2009; Judge & Ilies, 2002; McCrae & Costa, 1994).

Teh et al. (2011) noted that the BFP factors have relationships with the several conditions experienced by college students such as academic performance (Duff, Boyle, Dunleavy, & Ferguson, 2004), academic motivation (Komarraju & Karau, 2005), learning approaches (Zhang, 2003; Busato, Prins, Elshout, & Hamaker, 1999), and general health (Greven, Chamorro-Premuzic, Arteche, & Furnham, 2008).

The BFP factors were introduced by McCrae and Costa in 1982 (Karkoulian & Osman, 2009), consist of Agreeableness, Extraversion, Neuroticism, Conscientiousness, and Openness to Experience. Martins (2002) provided the aspects of each BFP factors:

- Agreeableness - this dimension has traits: “warm-hearted”, “friendly”, “tactful”, “sympathetic”, “peaceful”, “gentle”, “cooperative”, and “happy”.
- Extraversion - this dimension reflects traits: “talkative”, “sociable”, “assertive”, “outgoing”, “cheerful”, “bold”, and “active”.
- Neuroticism – this dimension describes traits: “nervous”, “moody”, “insecure”, “touchy”, and “agitated”.
- Conscientiousness – this dimension describes individuals as “responsible”, “organised”, “neat”, “hardworking”, “honest”, “careful”, and “trustworthy”.
- Openness to experience – this dimension reflects traits: “intelligent”, “creative”, “innovative”, “curious”, “questioning”, “complex”.

The BFP Factors and Interpersonal Trust

Studies have shown that the BFP factors have relationships with trust (e.g. Alsajjan, 2010) as general and interpersonal trust (e.g. Karkoulian & Osman, 2009) as particular. Alsajjan (2010) found that the BFP factors contribute to the customers’ trust to the cellular providers. His studies proved that only two dimensions of the BFP factors relate to the trust: conscientiousness relates to the integrity-based trust and benevolence-based trust whereas neuroticism only relates to the integrity-based trust.

Karkoulian and Osman (2009) tried to link the personality traits (the BFP factors) with interpersonal trust and KS. They only studied two dimensions of the BFP factors: agreeableness and neuroticism. Using interpersonal trust as a mediator, they found that those two dimensions influence KS among employees in medium size organisations.

Studies have shown openness to experience and conscientiousness are supportive for KS (e.g. Matzler & Müller, 2011; Matzler et al., 2008; Wang & Yang, 2007; Cabrera, Collins, & Salgado, 2006; Mooradian et al., 2006). Nonetheless, Sheng, Noe, and Wang (2011) found that in organization that assesses employees on KS and compensate them for it, employees with low level of openness are encouraging to share their knowledge to elude negative assessments or attain payoffs.

Agreeableness and Interpersonal Trust

People who have high level of agreeableness tend to be “trusting” (Mooradian et al., 2006; John & Srivastava, 1999). The level of trust is proportional to how much knowledge will be shared. The higher level on

trust among employees, the more substantial KS in an organisation (Abrams et al., 2003). Agreeable person who has high interpersonal trust is more willing to share knowledge to others (Karkoulian & Osman, 2009).

Extraversion and Interpersonal Trust

People who have high level of extraversion tends to like working with others (Zhang, 2006), focus on having a good relationship ("relationship-oriented") and well action ("action-oriented") in a community (Barrick & Mount, 1991; Fang & Liu, n.d.). They also like to involve in either formal or informal avenue to share knowledge. Since the willingness to share knowledge is dependent on trust (Fang & Liu, n.d.), extroverts are regarded having interpersonal trust.

Neuroticism and Interpersonal Trust

Neuroticism is described as a state that contains a great of negative emotions such as anger, unrest, stress, pressure, etc (Barrick & Mount, 1991; Fang & Liu, n.d.). Individuals who score high in neuroticism incline to feel usual conditions as uncomfortable and complicated (Karkoulian & Osman, 2009). The state like unrest or scare brings negative impact on trust (Fang & Liu, n.d.) thus neurotic individuals are not willing to share knowledge.

Conscientiousness and Interpersonal Trust

High conscientiousness person has traits: obedient, "reliable", "dependable", conscientious, "organised", and "hardworking" (Barrick & Mount, 1991; Teh et al., 2011). Conscientious individuals might presume knowledge as one of the most essential parts of their work and think that acquiring and sharing knowledge with others are vital to regiment their work effectively (Wang & Yang, 2007). Since conscientious individuals are willing to share knowledge, it can be assumed they have high interpersonal trust.

Openness to Experience and Interpersonal Trust

Openness to experience relates to traits such as "imaginability", "curiosity", "artistic sensitivity", and "originality" (Cabrera et al., 2006). Open individuals are interested in exploring new challenges such as learning new knowledge, so it can be concluded that they also like to share their knowledge with others (Wang & Yang, 2007). Cheng, Wang, Tsai, and Chou (n.d.) found that trust mediates the relationship between openness to experience and KS behavior.

Interpersonal Trust and KS

Scholars such as Nguyen and Kreng (2009), Abrams et al. (2003), Levin et al. (2002), Levin et al. (n.d.), and Mayer et al. (1995) have shown that interpersonal trust has a great effect on KS. Interpersonal trust enhances the exchange of resources between two parties, reduces the deal costs by lessening the either party's action to protect its interests, mitigates the expenses of KS, and escalates the possibility that new knowledge can be conceived and maintained (Nguyen & Kreng, 2009; Currall & Judge, 1995). Riege (2005) mentioned that individual may lack trust either in people because they might misappropriate knowledge or take unfair merit for it or in reliability and validity of knowledge because of the source.

3. RESEARCH METHODOLOGY

Research Design

Research design is a schema of research we plan to do. It contains four main ideas: "the strategy", "the conceptual framework", "the question of who or what will be studied", and the tools to collect and analyse data (Punch, 2009).

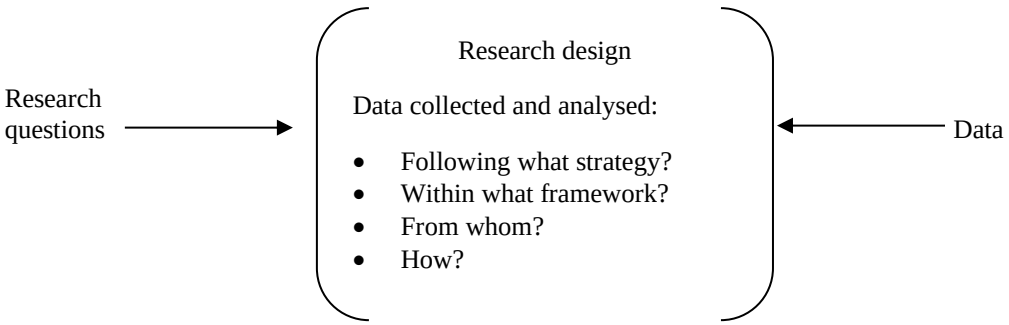

Figure 8. Research design connects research questions to data (Source: Punch, 2009)

The term *strategy* refers to the usage of "logic" or "rationale" to answer the research questions (Punch, 2009). The strategy of inquiry triggers the design (Punch, 2009) and it is essential for the whole research approach

(Creswell, 2003). Choosing a strategy depends on the research approach whether it is quantitative, qualitative, or mixed methods.

Table 6. Alternative strategies of inquiry (Punch, 2009; Creswell, 2003)

Quantitative	Qualitative	Mixed methods
Experimental	Narratives	Sequential
Quasi-experimental	Phenomenologies	Concurrent
Non-experimental	Ethnographies	Transformative
	Grounded theory	
	Case studies	
	Action research	

The second idea of research design is a conceptual framework. A conceptual framework basically represents the concepts or variables that we study about and their rapport with each other (Punch, 2009). A conceptual framework for this study has been discussed in section 2. Quantitative designs have full-fledged predetermined framework, containing variables (independent and dependent) and their link to each other whereas qualitative designs do not contain conceptual framework, involving a considerable inconsistency (Punch, 2009). The third idea is mainly about who will be chosen as a sample for data collection. The last main idea concerns about the instruments and procedures that are used in collecting and analysing data.

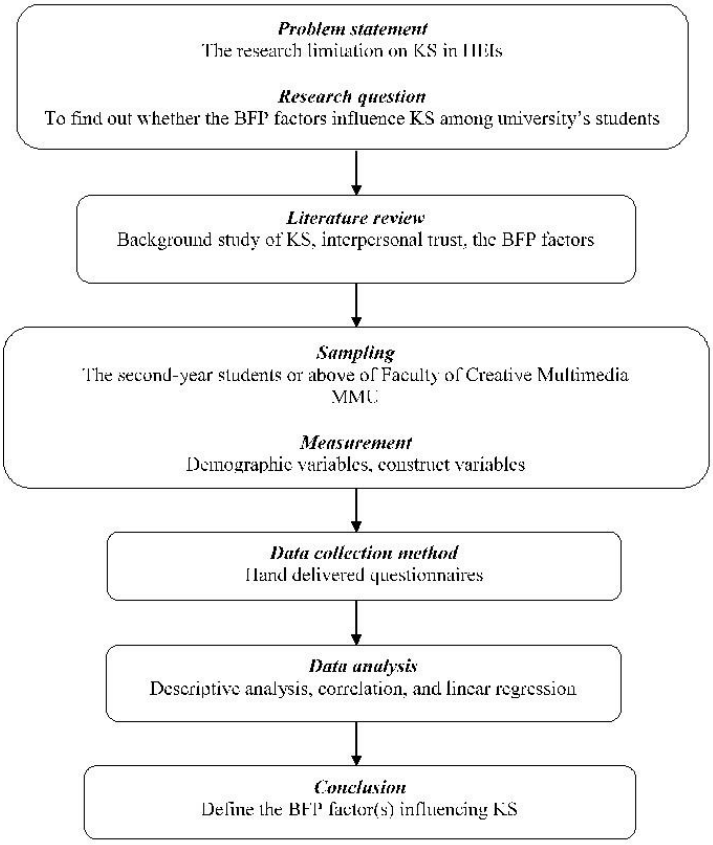

Figure 9. Research design diagram

Research method and hypotheses

There are three research methods that can be used for data collection and analysis: qualitative, quantitative, and mixed methods. The choice of research method depends on the level of prespecified feature, closed-ended or open-ended question, and numeric or non-numeric data analysis (Creswell, 2003). The difference between three research methods can be seen in table 7.

Table 7. Quantitative, Qualitative, and Mixed Methods Procedures (Source: Creswell, 2003)

Quantitative Research Methods	Qualitative Research Methods	Mixed Methods Research Methods
Predetermined methods	Emerging methods	Both predetermined and emerging methods
Close-ended questions	Open-ended questions	Both open- and close- ended questions
Performance data, attitude data, observational data, and census data	Interview data, observation data, document data, and audiovisual data	Multiple forms of data drawing on all possibilities
Statistical analysis	Text and image analysis	Statistical and text analysis

Based on the attributes that stick in each research method as shown in table 7, the quantitative research methods is chosen for this study. As shown in table 6, there are three types of design in quantitative research methods: experimental, quasi-experimental, and non-experimental.

The type of research that used in this study is correlational research. Correlational research is used to specify naturally the relationships among two or more variables without any involment of "intervention" or "manipulation". (Fraenkel & Wallen, 2003). The non-experiment is comparable to the correlational (Punch, 2009).

The main concepts in quantitative research are variables (Punch, 2009). There are two types of variables that used in this study: independent and dependent variables. According to LaFotnain and Bartos (2003), independent variable is the variable that can be changed and controlled by the researcher whereas dependent variable is the variable that is being quantified (as cited in Mynbayev, 2010). The dependent variable reacts to the independent variable.

Two steps of analysing data are needed to answer the research question. The first step is to determine whether the BFP factors influence interpersonal trust. The second step is to determine whether KS is influenced by interpersonal trust.

Table 8. Correlation between the BFP factors and interpersonal trust

Independent Variables	Dependent Variable
Agreeableness	Interpersonal trust
Openness	
Neuroticism	
Extraversion	
Conscientiousness	

Table 9. Correlation between the interpersonal trust and KS

Independent Variable	Dependent Variable
Interpersonal trust	KS

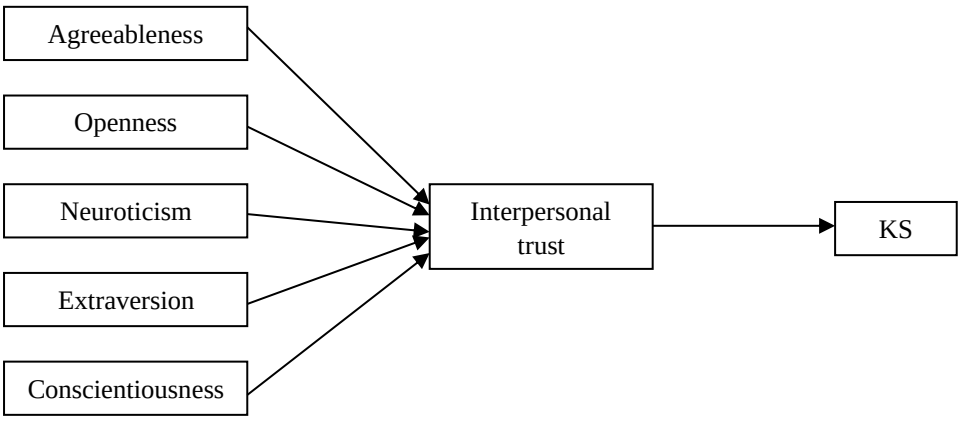

Figure 10. The overall corellation among the BFP factors, Interpersonal trust, and KS

Punch (2009) defined hypothesis as a forecasted answer to a research question. Based on literature review (see section 2.5), there are six hypotheses that proposed in this study.

H1: There is a positive relationship between Extraversion and Interpersonal trust.
H2: There is a positive relationship between Agreeableness and Interpersonal trust.
H3: There is a positive relationship between Conscientiousness and Interpersonal trust.
H4: There is a negative relationship between Neuroticism and interpersonal trust.
H5: There is a positive relationship between Openness to experience and interpersonal

trust.
H6: There is a positive relationship between Interpersonal trust and KS.

Population and sample

Population is the accumulation of all elements (individuals, objects, and events) that corresponds to the specified set of provisions (Mynbayev, 2010; Nachmias & Nachmias, 1996). The small portion of population that will be targeted for data collection is called sample.

The population in this study is the whole undergraduate students in MMU Cyberjaya. The chosen sample is the undergraduate students that study in Faculty of Creative Multimedia and Faculty of Management MMU Cyberjaya. Participants in this study are selected based on several criteria as listed below.
They must be:
- in undergraduate level currently
- willing to participate

Research Instrument

According to Bouffard and Little (2004), there are six research instruments: "surveys and questionnaires", "interviews and focus groups", "observations", "tests and assessments", "document reviews", and "secondary sources and data reviews" (as cited in Azira, 2008). Questionnaire method was chosen for data collection.

The questionnaire used for this study consists of four sections: personal profile, Interpersonal trust, KS, and personality traits (Agreeableness, Extraversion, Neuroticism, Conscientiousness, and Openness to experience). The personality traits were measured using the instrument developed by John (1990) that cited in Teh et al. (2011). The items for interpersonal trust were adapted from Chen, Koch, Chung, and Lee (2007); Cook and Wall (1980) whilst the items for KS were adapted from Chen et al. (2007); Lin, Leung, and Koch (2006); Bock and Kim (2002). The three parts of questionnaire were measured using five point Likert scale that ranged from 1 = strongly disagree to 5 = strongly agree.

Implementation or Procedure

Azira (2008) mentioned that there are four approaches that can be used to collect data using survey and questionnaire method: "face to face", "by mail or fax", "via telephone", and "via email or the Internet". Face-to-face method was chosen because according to Azira (2008), hand-delivered questionnaire has higher percentage of response and it brings benefits to the credibility of response because they are able to ask for a favor if they do not understand the questions. Questionnaire was distributed before the lecture class with permission of the relevant lecturers.

4. RESULTS

Reliability test

Cronbach's alpha were used to test the realibility and internal consistency of the research instrument (in this case survey questionnaire). Reliability means whether the instrument will generate the same results every time it is given to the same person in the same condition whilst internal consistency means whether all items that are contained in the instrument quantify the same thing (George & Mallery, 2006). George and Mallery (2006) provide the rule of thumb for the alpha value (α): "α > .9 – excellent, α > .8 – good, α > .7 – acceptable, α > .6 – questionnable, α > .5 – poor, α < .5 – unacceptable" (p. 231).

Total items within survey questionnaire is 49 items. Those items divided into 3 sections namely Interpersonal trust (6 items), KS behaviors (5 items), and the BFP factors (38 items). The BFP factors itself consist of extraversion (7 items), agreeableness (8 items), conscientiousness (9 items), neuroticism (7 items), and openness to experience (7 items). Cronbach's alpha for overall items was 0.734. It shows that the internal consistency of all items is acceptable.

Table 10. Cronbach's alpha for all construct variables

Cronbach's Alpha	Number of Items
0.734	49

Table 11. Cronbach's alpha for each construct variable

Construct Variable	Cronbach's Alpha	Cronbach's Apha if Item Deleted	Number of Items	Survey Items
Interpersonal trust	0.589	0.665	6	I1, I2, I3, I4, I5, I6
Knowledge sharing behaviors	0.619	0.738	5	K1, K2, K3, K4, K5
Extraversion	0.705	0.727	7	E1, E2, E3, E4, E5, E6, E7

Agreeableness	0.692	-	8	A1, A2, A3, A4, A5, A6, A7, A8
Conscientiousness	0.672	0.682	9	C1, C2, C3, C4, C5, C6, C7, C8, C9
Neuroticism	0.694	0.699	7	N1, N2, N3, N4, N5, N6, N7
Openness to Experience	0.748	0.775	7	O1, O2, O3, O4, O5, O6, O7

Demographic Analysis

This section covers the analysis of the respondents' profiles. The respondents' profile includes gender, study year, and faculty. There were 150 questionnaires managed to collect. Out of 150 questionnaires, 5 questionnaires were dismissed because the respondents did not fully fill in demographic section, 12 questionnaires were neglected because of the missing answers, 9 questionnaires were discarded because of double answers in one question. The rests of questionnaires that could be reliable for this study were 124 questionnaires. Out of 124 respondents, 44.4% of total respondents are female (55 female respondents) and 55.6% are male (69 male respondents).

In MMU, undergraduate students are differentiated based on their study year. There are three levels of study year namely:

- Beta student is similar to first-year undergraduate student.
- Gamma student is similar to second-year undergraduate student.
- Delta student is similar to third-year undergraduate student.

The level of study year distribution of respondents is shown in table 4.4. The table shows that 9.7% are Beta students (12 students), 30.6% are Gamma students (38 students), and 59.7% are Delta students (74 students).

Linear regression analysis

Linear regression is a statistical analysis technique that used to explain dependent variable, usually symbolized as Y based on value of independent variable, usually symbolized as X. The mathematic formula of linear regression is shown below.

$$Y = a + bX$$

Y = dependent variable
a = intercept
b = slope
X = independent variable

Linear regression between construct variables is shown below. The author does not provide plot analysis that used to cleanse data from outliers because it has been explained in section 4.4. To prevent the redundant work, the author only provides the results of linear regression analysis in this section after eliminating outliers.

Linear regression between extraversion and interpersonal trust

Table 12. Coefficients for extraversion

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.889	.197		14.681	.000
	Extraversion	.218	.061	.316	3.593	.000

a. Dependent Variable: Interpersonal trust

Sig t reflects the strength of relationship between each independent variable and dependent variable. Sig t for Extraversion is 0.000 which is less than 0.05 means that independent variable extraversion is a predictor for dependent variable interpersonal trust. From table 12, regression equation can be formulated as shown below.

$Y = 2.889 + 0.218X$

Where:

Y = interpersonal trust
X = extraversion

The equation above means that for every unit increase in extraversion, the interpersonal trust will also increase by 0.218 unit. That shows a positive relationship between extraversion and interpersonal trust so that hypothesis H1 (refer section 3.3) is supported.

Linear regression between agreeableness and interpersonal trust

Table 13. Coefficients for agreeableness

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.370	.323		7.328	.000
	Agreeableness	.315	.086	.314	3.649	.000

a. Dependent Variable: Interpersonal trust

From table 13, Sig t is 0.000 which is less than 0.05. It means that variable agreeableness is a predictor for interpersonal trust. The linear regression equation can be formulated as shown below.

$Y = 2.370 + 0.315X$

Where:

Y = interpersonal trust

X = agreeableness

The equation above means that for every unit increase in agreeableness, the interpersonal trust will also increase by 0.315 unit. It shows that there is positive relationship between agreeableness and interpersonal trust so that hypothesis H2 is supported.

Linear regression between conscientiousness and interpersonal trust

Table 14. Coefficients for conscientiousness

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.612	.248		14.544	.000
	Conscientiousness	-.007	.075	-.009	-.098	.922

a. Dependent Variable: Interpersonal trust

Table 14 also shows that Sig t is 0.922 which is greater than 0.05 means that conscientiousness is not predictor for variable interpersonal trust. Since there is no linear relationship between conscientiousness and interpersonal trust so that hypothesis H3 is rejected.

Linear regression between neuroticism and interpersonal trust

Table 15. Coefficients for neuroticism

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.977	.169		23.520	.000
	Neuroticism	-.132	.056	-.213	-2.347	.021

a. Dependent Variable: Interpersonal trust

Sig t of neuroticism is 0.021 which is less than 0.05. It means that neuroticism has linear relationship with interpersonal trust. Based on table 4.40, linear regression equation is formulated as shown below.

$Y = 3.977 – 0.132X$

Where:

Y = interpersonal trust
X = neuroticism

The linear equation above means that for every unit increase in neuroticism, the interpersonal trust will decrease by 0.132 unit. In a nutshell, there is negative relationship between neuroticism and interpersonal trust so that hypothesis H4 is supported.

Linear regression between openness to experience and interpersonal trust

Table 16. Coefficients for openness to experience

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.378	.248		13.608	.000
	Openness	.057	.067	.079	.853	.395

a. Dependent Variable: Interpersonal trust

Table 16 above shows that Sig t of openness to experience is 0.395 which is greater than 0.05. it means that openness to experience is not a predictor for interpersonal trust so that hypothesis H5 (refer section 3.3) is rejected.

Linear regression between interpersonal trust and KS

Table 17. Coefficients for interpersonal trust

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.627	.292		9.004	.000
	Interpersonal_trust	.262	.081	.288	3.224	.002

a. Dependent Variable: KS

From table 17, Sig t of interpersonal trust is 0.002 which is less than 0.05. It means that there is significant relationship between Interpersonal trust and KS. Linear regression equation can be formulated as shown below
$Y = 2.627 + 0.262X$
Where:

Y = KS
X = interpersonal trust

The equation above means that for every unit increase in interpersonal trust, KS will also increase by 0.262 unit. That means there is positive relationship between interpersonal trust and KS so that hypothesis H6 is supported.

5. CONCLUSION AND SUGGESTION

In current knowledge-based economy, knowledge holds the important role to bring one country to be developed nation. University as a place to generate new knowledge as well as produce knowledge workers has obligation to ensure its graduates could contribute to society from what they have learnt during their studies.

Researches have pointed out that sharing information and knowledge can benefit organisation to achieve its goals. Since those university graduates might go to company, it is highly recommended that they could sharing what they have known to their colleagues.

This study focused on how the personality of university students could influence KS with their peers using interpersonal trust as moderator. The findings show that there is a relationship between the personality and KS and the result shows that three out of five personality treats influence KS among those students. Those three personality treats are extraversion, agreeableness, and neuroticism. This research also proved that KS is dependent on interpersonal trust. Past studies have shown that without trust KS is difficult to happen.

Since the sample in this study was undergraduate students, it is highly recommended to use graduate students as well as lecturers as samples for future research. Since the author used interpersonal trust as moderator

to link the BFP factors with KS so that it is still open many possiblities to use other KS enablers as moderator between the BFP factors and KS.

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