# What Drives Members to Continue Sharing Knowledge in a Virtual Professional Community? The Role of Knowledge Self-efficacy and Satisfaction

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**Abstract.** The present research explains members' intention to continue sharing knowledge in a virtual community in terms of knowledge self-efficacy and satisfaction. The research model was tested with the current users of a virtual professional community (Hong Kong Education City) and was accounted for 32% of the variance. Both knowledge self-efficacy and satisfaction play an important role in explaining members' intention to continue sharing knowledge. The findings contribute to the foundation for future research aimed at improving our understanding of user continuance behavior in virtual communities.

**Keywords:** Knowledge sharing, knowledge management, virtual community, community of practice, satisfaction, knowledge self-efficacy, information systems continuance, e-business.

## 1 Introduction

In contemporary information systems literature, there exists a general agreement about the value and importance of knowledge management [2], [18], [30], [31]. Traditional literature on knowledge management focuses mostly on knowledge creation and dissemination within organizations. However, with the growth of the Internet and the high penetration rate of Internet usage, considerable attention is being focused on the role of online social spaces (e.g., virtual communities) in knowledge management [25].

Conversational systems (e.g., online discussion forums in virtual communities) are a useful medium for knowledge extraction, exchange, and creation. For instance, conversations are captured so as to accommodate contextualization, search, and community [34]. Without the physical or temporal constraints in virtual communities, members with diverse organizational, national, and cultural backgrounds can contribute, discuss, learn from the community's explicit knowledge, and share their implicit knowledge with other members [7]. Specifically, they can share knowledge by helping each other to solve problems, telling stories of personal experiences, and

debating issues based on shared interests [36]. Virtual communities support new combinations of existing knowledge and the creation of new knowledge. Since messages in virtual communities are openly available, members can easily identify the synergistic possibilities that arise from the potential combinations of information from multiple resources [36].

Many professional bodies realize the potential of information and communication technologies in connecting individuals with common interests. Some researchers [1], [29], [37], however argue that the creation of an online social space does not guarantee that knowledge exchange will actually take place. This concern basically pertains to user acceptance of online social structures for knowledge exchange. In recent years, some information systems research in knowledge management has been conducted to address this concern [23], [37]. The success of a virtual community however depends primarily on whether members are willing to continue to participate and share their knowledge with others. Obviously, if there are a lot of participants who are willing to stay and contribute their knowledge in the community, this will improve the likelihood of connecting individuals who are able and willing to help. Therefore, it is important to identify what affects members' decisions to continue to stay and share in a virtual community.

A Virtual Professional Community (VPC) is a distinct type of virtual community in which people with common interests, backgrounds, and goals participate and collectively contribute to a database of professional knowledge. Basically, there are three different types of VPC:

- Intra-firm professional communities: Many virtual professional communities operate inside large firms, where they are often called "community of practice" (CoP). The main motivation for a CoP is to improve knowledge sharing among employees and to foster a creative and innovative enterprise culture. Intra-firm VPCs depend on the infrastructure and administration from the management of the firm.
- Inter-firm professional communities: Some virtual professional communities are established to improve and strengthen relationships with customers and partners. Given the increasingly competitive business environment, more and more companies are forming enterprise networks.
- Public professional communities: This type of community is often organized by third-party organizations, and its memberships are many times larger than those of traditional professional societies. The aims of these VPCs are to bring together audiences on specific topics, and to provide a platform for professionals with common interests and similar working culture to freely exchange their experience, to share information, and to foster social relationships.

In the current study, we focus on knowledge sharing behavior in public professional communities. Specifically, the empirical research in this study is conducted in a well-established virtual professional community in Hong Kong, Hong Kong Education City (www.hkedcity.net). We examine the characteristics and usage behaviors of knowledge contributors, as well as the motivations that drive them to continue sharing knowledge in the virtual community.

## 2 Theoretical Background

Past research on knowledge management primarily focused on the initial adoption of knowledge sharing behavior. This study investigates the confirmation stage where users evaluate their knowledge sharing behavior and make the decision to continue or discontinue the behavior. The theoretical foundation of the present study is reviewed. Specifically, the concepts of knowledge sharing, user satisfaction, as well as knowledge self-efficacy are addressed.

### 2.1 Knowledge Sharing

Virtual communities provide people with common interests, backgrounds, and goals to participate and collectively contribute to a set of professional knowledge. Knowledge is commonly conceived as a public good. A public good is characterized as *"a shared resource from which every member of a group may benefit, regardless of whether or not they personally contribute to its provision, and whose availability does not diminish with use"* [10]. The fundamental problem of public goods is that individuals merely consume the public good without contributing to the group or the institution, resulting in a social dilemma situation. Social dilemmas occur whenever an individual attempts to maximize its self-interest and makes rational decisions. Applying the public good concept to the knowledge sharing in virtual communities, there is a tendency for individuals to refuse to contribute and enjoy a free-ride. Particularly, electronic networks of practice allow everyone to access and consumer knowledge without making any contribution. Wasko and Tiegland [36] however urged that though public goods are subject to social dilemmas, they are often created and maintained through collective action.

Considerable attention has focused on factors that drive people to share knowledge in electronic networks of practice. Cheung and Lee [12] built on Batson public good framework [5] and classified the key factors determining user intention to share knowledge into four categories. Table 1 summarizes the key factors determining user intention to share knowledge. Among all these key factors, reciprocity and enjoyment of helping are the most widely studied factors.

**Table 1.** Key Factors of Knowledge Sharing in Previous Studies

| Category | Factors | References |
|---|---|---|
| Egoism | Extrinsic rewards | [9], [35] |
| | Image | [23] |
| | Organizational reward | [19], [23] |
| | Reciprocity | [9], [13], [19], [23], [37] |
| | Reputation | [13], [14], [35], [37] |
| | Self-interest | [13] |
| Collectivism | Social identity | [19], [22] |
| Altruism | Enjoyment of helping others | [13], [14], [23], [35], [37] |
| Principlism | Normative Commitment (Moral obligation) | [14], [22], [37] |

## 2.2  User Satisfaction

Early user satisfaction research tended to focus primarily on the operationalization of satisfaction construct and ignored the theoretical bases. According to Melone [27], "this lack of agreement on the conceptual definition of the user-satisfaction construct has lead to a situation in which there are many operationalizations and an equal number of conceptual definitions, for the most part lacking theoretical foundation" (p.80). In response to the call for a rigorous theoretical support in the study of user satisfaction, recent studies are more grounded with theories. For instance, Devaraj et al. [16] examined consumer-based channel satisfaction using technology acceptance model, transaction cost analysis, and service quality. Bhattacherjee [6], McKinney et al. [26] and Susarla et al. [33] adopted the expectation confirmation theory to examine satisfaction. Among diverse theoretical frameworks, expectation confirmation theory has been receiving a great deal of attention in recent IS research. These studies provided insights to user psychology and explained user satisfaction formation processes [11].

Bhattacherjee [6] proposed an IS continuance model that relates satisfaction and perceived usefulness to the degree in which users' expectations about an information system are confirmed. Expectation provides a baseline level to evaluate the actual performance of an IS and confirmation (disconfirmation) in turn determines satisfaction. This line of research is consistent with the expectancy value theory, where people form expectations and then evaluates their experiences.

## 2.3  Knowledge Self-Efficacy

Research on knowledge management has already suggested the importance of knowledge self-efficacy on people intention to share knowledge [9], [10], [23]. Knowledge self-efficacy refers to people believing their knowledge can help other members in virtual communities. This definition is built upon the social cognitive theory [4]. Bandura [4] suggested that the motivations of performing a behavior do not stem from the goals themselves, but from the self-evaluation that is made conditional on their fulfillment. He even suggested that "mastery experience" is the most important factor determining self efficacy. In other words, success raises self-efficacy, failure lowers it. When applying this concept in the public good context, knowledge self-efficacy refers to the perception of the criticality of the contributions to the provision of a public good. In general, knowledge self-efficacy promotes the sharing of knowledge.

# 3  Research Model and Hypotheses

Fig. 1 depicts a research model explaining user intention to continue using a virtual professional community for knowledge sharing.
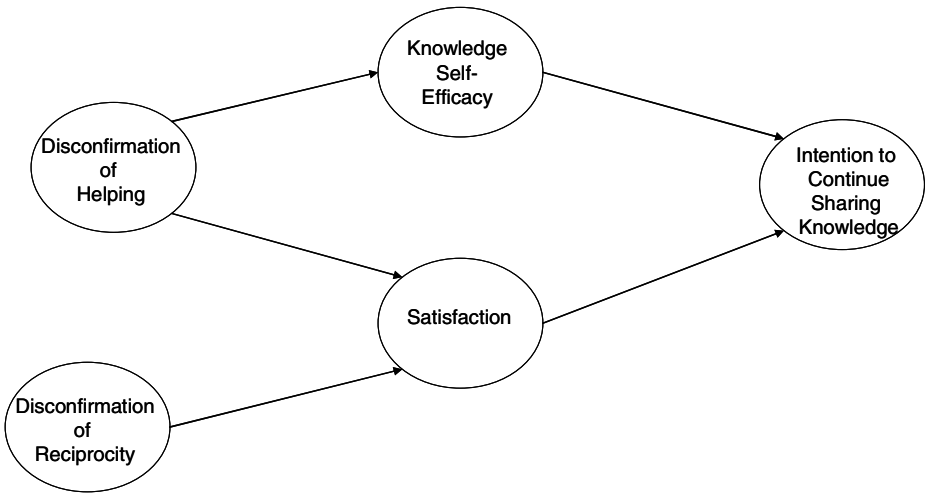
**Fig. 1.** Research Model

### 3.1 Intention to Continue Sharing Knowledge

Knowledge sharing is a necessary component of knowledge management. It embeds the notion of "*willingness to share*" or "*voluntary act of making information available to others…*" [15]. Since this study focuses on continuance behaviour, *"Intention to continue sharing knowledge"* is defined as *"the likelihood that a user will continue sharing knowledge in a virtual community"*. The concept is built on the IS continuance model.

### 3.2 Reciprocity

*"A motive is egoistic if the ultimate goal is to increase the actor's own welfare"* [5]. Explanations of action for the public good in terms of egoism can be linked to personal motivational theories, as well as social exchange theory [8]. Reciprocity is conceived as a benefit for individuals to engage in social exchange. People have an expectation that their contribution will result in returns in the future. In knowledge sharing literature, researchers found that knowledge sharing is facilitated when people who share knowledge in virtual communities (any electronic network of practices) believe in reciprocity. There is a positive relationship between reciprocity and knowledge contribution intention [23], [37].

The current study goes beyond the initial adoption and focuses on continuance behavior in electronic networks of practice, particularly continuous knowledge sharing in virtual communities. It is believed that after several interactions with other users in a virtual community, users are able to compare their expectations with the actual experiences of using the virtual community. Specifically, they can evaluate whether reciprocity has actually occurred. Based on expectation confirmation theory [28], confirmation (disconfirmation) will result in satisfaction (dissatisfaction), and satisfaction will lead to continuance intention. Applying this argument to the current

investigation, it is believed that if the gap between a user's expectation and actual reciprocal experience is large, the user will feel satisfied (dissatisfied) with their experience with the virtual community, and in turn he/she will have a higher likelihood to continue (discontinue) to share knowledge. In other words, if the users find that they can receive the reciprocity as they expected, they will feel satisfied and in turn they will have a higher chance to continue sharing knowledge in the virtual community. Thus, in this study, the hypothesis is:

*H1: Users with a higher confirmation (positive disconfirmation) of reciprocity in a virtual community relates positively to satisfaction with the virtual community.*
*H2: Satisfaction with the virtual community relates positively to intention to continue sharing knowledge in the virtual community.*

### 3.3   Enjoyment of Helping and Helping Behaviour

*"Altruism is motivation with the ultimate goal of increasing the welfare of one or more individuals other than oneself"* [5]. Explanations of action for the public good in terms of altruism can be linked to empathic emotion [5]. Enjoyment in helping has been frequently cited as an important factor that determines user willingness to share or contribute knowledge in electronic networks of practice or online social spaces [21], [23], [37]. People are willing to help others to solve challenging problems because answering questions provides them with feelings of pleasure [24].

In this case, the goal is to help others and it is the motivation for them to contribute. After users have had several interactions with other users, they are able to judge whether their contributions are helpful to others. Users first form an expectation about the outcomes of their helping behaviours, for instance, they expect their messages would be helpful to others. After their interactions with other members in the virtual community, they will compare their expectation with their actual experience, that is, to evaluate whether their messages are really helpful to others. If there is a positive disconfirmation (their messages are more helpful than expected), users will feel satisfied. On the other hand, if there is a negative disconfirmation (their messages are less helpful than expected), users will feel dissatisfied. Thus, the hypothesis is:

*H3: Users with a higher confirmation (positive disconfirmation) of helping others in a virtual community relates positively to satisfaction within the virtual community.*

It is also believed that if users have a positive disconfirmation with helping in the virtual community, their knowledge self-efficacy will increase. Bandura [4] suggested that the motivations of performing a behaviour do not stem from the goals themselves, but from the self-evaluation that is made conditional on their fulfilment. If the users found their knowledge to be helpful to other members in the virtual community, it will enhance their confidence that their knowledge is able to help other people. Therefore, the hypothesis is:

*H4: A higher confirmation (positive disconfirmation) of helping others in a virtual community relates positively to knowledge self-efficacy.*

Research on knowledge management has already suggested the importance of knowledge self-efficacy on people's intention to share knowledge [9], [10], [23]. It is believed that knowledge self-efficacy will have an important impact on user intention to continue sharing knowledge in a virtual community. The hypothesis is:

*H5: Knowledge self-efficacy relates positively to intention to continue sharing knowledge in the virtual community.*

## 4   Research Design

The research model was empirically tested in a real virtual community, Hong Kong Education City (www.hkedcity.net). Hong Kong Education City (HKed City) is a leading and one-stop education portal with a vision to build Hong Kong into a learning city. With the vision of *"Bridging the Learning Communities. Building the Learning City"*, Hong Kong Education City aims at taking a leading role in promoting quality education and the use of IT in education to schools, teachers, students, parents, and the public. In the current study, the unit of analysis are teachers or educators who use the *"Teachers' Channel"* of the Hong Kong Education City (www.hkedcity.net). "Teachers' Channel" is a virtual professional community that provides teachers and educators with resources on professional development and updated news on educational related issues.

### 4.1   Data Collection and Responses

The target respondents of this study were the teachers who have used the "Teachers' Channel" in HKed City. In order to reach the respondents, an invitation email with the URL of the online questionnaire was sent to both primary and secondary school teachers. The participation of this study was voluntary. To increase the response rate, an incentive of three USB flash drives and thirty book coupons were offered as lucky draw prizes. Reminder emails were also sent a few weeks after the first invitation email.

A total of 315 responses were collected in this study and 60 of them have contributed in the virtual community before. Among the 60 contributors, 72% were male and 28% were female. About 22% were aged 21-30 and only 8% were aged 51 or above. 72% were secondary school teachers and 28% were primary school teachers, and 22% had more than 20 years teaching experiences. In terms of the usage behaviour in the virtual community (HKed City), about 40% had less than 2-year experience with the virtual community, but over 40% of them used it every week. Non-response error is estimated using the comparison of differences between the early and late respondents. This is the most commonly used method for non-response error estimation among IS researchers [30]. We did not find the error exists in this study.

### 4.2   Measures

Empirical research on continuance behaviour in knowledge management is still in its infancy. Most measures were developed and modified based on some established

scales. The measure of *"Intention to continue sharing knowledge"* was adapted from Bagozzi and Dholakia [3]. Items measuring "Disconfirmation of reciprocity", "Disconfirmation of Helping", and "Knowledge self-efficacy" were adapted and modified from Kankanhalli et al. [23] to fit the specific context of virtual community. The measures of *"Satisfaction"* were borrowed from Bhattacherjee [6].  All the measures of the constructs in the current study are listed in Appendix A.

A multi-item approach was used. That means each construct was measured by a few items for construct validity and reliability. A slider scale was used in this study and provided a continuous scale from 0 to 100 or -50 to 50 (See Fig. 2). Respondents either clicked or dragged the slider to indicate their preference point.
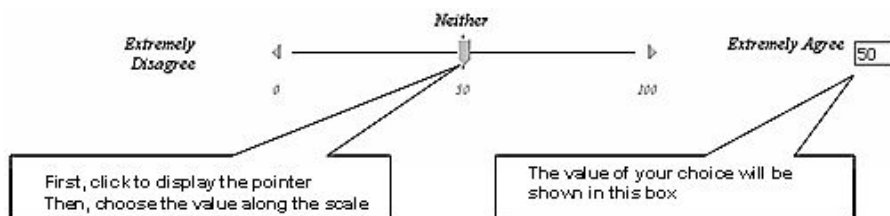


**Fig. 2.** The Slider Scale

## 5   Results

Following the two-step analytical procedures [20], the measurement model is first examined and then the structural model is assessed.

### 5.1   Measurement Model

Convergent validity, which indicates the extent to which the items of a scale that are theoretically related to each other should be related in reality, was examined using the composite reliability (CR) and the average variance extracted (AVE). The critical values for CR and AVE are 0.7 and 0.5 respectively [17]. As shown in Table 2, all CR and AVE values meet the recommended thresholds.

Discriminant validity is the extent to which the measure is not a reflection of some other variable. It is indicated by low correlations between the measure of interest and the measure of other constructs that is not theoretically related to Fornell and Larcker [17]. Evidence about discriminant validity can be demonstrated when the square root of the average variance extracted for each construct is higher than the correlations between it and all other constructs. Table 2 shows that the squared root of average variance extracted for each construct is greater than the correlations between the constructs and all other constructs. The results suggest that an adequate discriminant validity of the measures.

**Table 2.** Correlation Matrix and Psychometric Properties of Key Constructs

|  | CR | AVE | CI | DRECIP | DHELP | SAT | KSE |
|---|---|---|---|---|---|---|---|
| **Continuance Intention (CI)** | 0.99 | 0.98 | 0.99 |  |  |  |  |
| **Disconfirmation of Reciprocity (DRECIP)** | 0.95 | 0.85 | 0.77 | 0.92 |  |  |  |
| **Disconfirmation of Helping (DHELP)** | 0.97 | 0.92 | 0.49 | 0.68 | 0.96 |  |  |
| **Satisfaction (SAT)** | 0.97 | 0.88 | 0.55 | 0.69 | 0.71 | 0.94 |  |
| **Knowledge Self-Efficacy (KSE)** | 0.88 | 0.65 | 0.52 | 0.65 | 0.86 | 0.77 | 0.81 |

Note: Shaded diagonal elements are the square root of AVE for each construct Off-diagonal elements are the correlations between constructs.

## 5.2  Structural Model

Fig. 3 presents the overall explanatory power, estimated path coefficients (all significant paths are indicated with asterisks), and associated t-value of the paths of the research model. Test of significance of all paths were performed using the bootstrap resampling procedure.
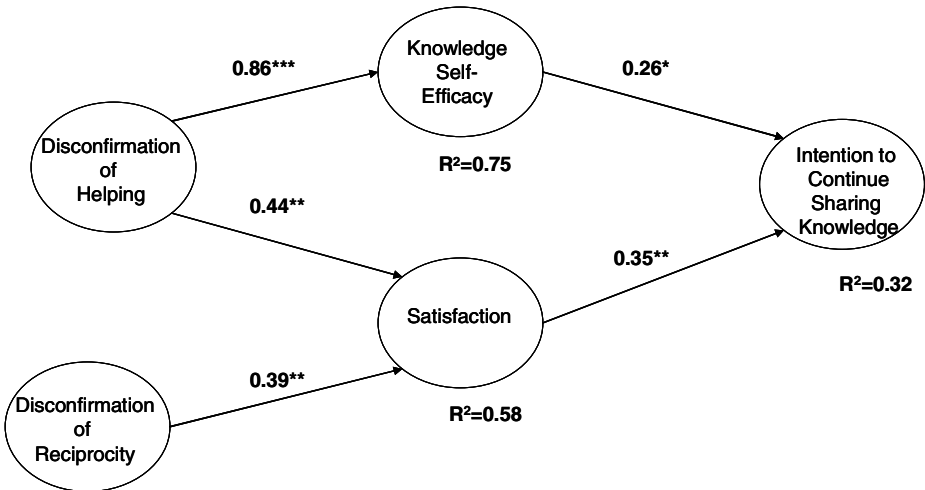


**Fig. 3.** Result of the Research Model (Note: *p<0.10, **p<0.05, ***p<0.01)

The results show that the exogenous variables explain 32% of the variation in *"Intention to Continue sharing Knowledge in a virtual community"*, 35% of the variance in *"Satisfaction"* and 75% of the variation in *"Self-Efficacy in Knowledge Sharing"*. All the structural paths are found to be statistically significant in the research model. Both 'disconfirmation of reciprocity' and 'disconfirmation of helping' have a significant impact on satisfaction with the virtual community. Their path coefficients are 0.39 and 0.44 respectively. Disconfirmation of helping is also

strongly related to user's knowledge self-efficacy, with a path coefficient at 0.86. Finally, knowledge self-efficacy and satisfaction affect intention to continue sharing knowledge significantly, with path coefficients of 0.26 and 0.35 respectively.

## 6  Discussion and Conclusion

This study attempts to test a research model of knowledge-sharing behaviors in virtual communities. In particular, this study goes beyond initial adoption (why people share) to continuance (why people continue to share). The finding suggests that an important way to promote the continuance of knowledge sharing is to increase knowledge self-efficacy and enhance user satisfaction. When members find that their shared knowledge can help others, they will be satisfied and will gain higher knowledge self-efficacy, and thus they will tend to continue sharing knowledge in the virtual community.

This study contributes to existing virtual community and knowledge management research in several ways. First, this study adds to the limited research done on knowledge sharing behaviours in virtual communities of professional groups and allows future research to build upon it. This study also allows operationalization and validation of instruments in the research model. Finally, this study goes beyond initial adoption and examines continuance in the context of knowledge sharing in virtual communities.

Apart from the theoretical contributions, the results of this study also provide some insights to community designers for knowledge management. Specifically, it is important for community designers to use some guidelines and tools to encourage members to continue sharing knowledge.

- ▪ *Providing members with a recognition mechanism:* Community designers should propose the use of some recognition mechanisms where members who have provided useful suggestions to other members are identified and informed that they have helped others.
- ▪ *Creating members' social network:* Community designers should try to integrate member-produced content, as well as content from a member's connections, into the member profiles. This can help connect knowledge contributors and adopters so that adopters can show their appreciation for the knowledge received.

In interpreting the results of this study, one must pay attention to a number of limitations. First, the theoretical model accounts for 32% of the variance in continuance intention and suggests that some important predictors may be missing. Second, the online survey involves self-reported measures, which may be subject to the influence of common method bias. Finally, this study represents one type of professional group where the participants usually share some common interests, background, and goals to participate and collectively contribute to the professional knowledge. It is desirable to replicate the results with other types of virtual communities. Obviously, future research should examine these speculations.

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# Appendix A

| | |
|---|---|
| **Continuance Intention (Modified from Bagozzi and Dholakia [3])** | |
| CI 1 | Please express the degree to which you might intend to continue sharing in the Teachers' Channel in the next few weeks. (Extremely Unlikely/ Extremely Likely) |
| CI 2 | I intend to continue sharing in the Teachers' Channel in the next few weeks. (Extremely Disagree/ Extremely Agree) |
| **Disconfirmation of Reciprocity (Modified from Kankanhalli et al. [23])** | |
| DRECIP 1 | Compared to my initial expectations, the level of reciprocity (i.e., get back help when I need) in the Teachers' Channel is (Much worse than expected/ Much better than expected) |
| DRECIP 2 | To what extent does the degree of reciprocity (i.e., somebody responds when I am in need) occurring in the Teachers' Channel meet your original expectations? (Far below my expectation/ Far above my expectation) |
| DRECIP 3 | How big is the difference between what you expected when you are giving an answer to others and what the reciprocity actually occurred in the Teachers' Channel? (Far below my expectation/ Far above my expectation) |
| **Disconfirmation of Helping (Modified from Kankanhalli et al. [23])** | |
| DHELP 1 | Compared to my initial expectations, the helpfulness of my answers in the Teachers' Channel is (Much worse than expected/ Much better than expected) |
| DHELP 2 | Compared to my initial expectations, the helpfulness of my response on helping other people to solve problems in the Teachers' Channel is (Far below my expectation/ Far above my expectation) |
| DHELP 3 | How big is the difference between what you perceived the helpfulness of your answers to be and how they actually helped others in the Teachers' Channel? (Far below my expectation/ Far above my expectation) |
| **Knowledge Self Efficacy (Modified from Kankanhalli et al. [23])** | |
| SE 1 | I have confidence in my ability to provide knowledge that others in the Teachers' Channel consider valuable. (Extremely Disagree/ Extremely Agree) |
| SE 2 | I have the expertise needed to provide valuable knowledge for Teachers' Channel. (Extremely Disagree/ Extremely Agree) |
| **Satisfaction (Bhattacherjee [6])** | |
| | How do you feel the knowledge sharing experience with Teachers' Channel? |
| SAT 1 | (Extremely Dissatisfied/ Extremely Satisfied) |
| SAT 2 | (Extremely Displeased/ Extremely Pleased) |
| SAT 3 | (Extremely Frustrated/ Extremely Contented) |
| SAT 4 | (Absolutely Terrible/ Absolutely Delighted) |