

## Research Article

# Research on Influencing Factors of Knowledge Hiding Behavior in Socialized Q&A Communities: Taking Zhihu as an Example

Wen-Zhu Li <sup>1</sup>, Jiang-Fei Chen <sup>2,3,4</sup>, Xin Feng <sup>3,5</sup> and Qiang Yan <sup>1</sup>

<sup>1</sup>School of Economics and Management, Beijing University of Posts and Telecommunications, Beijing 100876, China

<sup>2</sup>School of Arts & Design, Yanshan University, Qinhuangdao 066004, China

<sup>3</sup>Information Center for Military and Civilian Collaboration of Beijing-Tianjin-Hebei, Yanshan University, Qinhuangdao 066004, China

<sup>4</sup>Hebei Design Innovation and Industrial Development Research Center, Yanshan University, Qinhuangdao 066004, China

<sup>5</sup>School of Economics and Management, Yanshan University, Qinhuangdao 066004, China

Correspondence should be addressed to Xin Feng; 149987543@qq.com

Received 15 July 2022; Revised 12 August 2022; Accepted 3 September 2022; Published 27 September 2022

Academic Editor: Andrea Murari

Copyright © 2022 Wen-Zhu Li et al. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

With the normalization of epidemic prevention and control, the expression of the public's demand for health information on online platforms continues to increase, while knowledge hiding behavior has seriously hindered the communication and dissemination of epidemic prevention knowledge and has a negative impact on public communication and access to health information in the socialized Q&A communities. Therefore, further stimulating diving users' activity and reducing their knowledge hiding behavior have become the key to the sustainable development of epidemic prevention and control and communities. Based on the social cognition theory, from the perspective of individual cognition and external environment, this study constructs a theoretical model of the influencing factors of users' knowledge hiding behavior in the socialized Q&A communities in the post-epidemic era and puts forward relevant assumptions. 151 effective questionnaires are collected and an empirical analysis is carried out by using the structural equation model. The results show that outcome expectation, community atmosphere, and requesting negatively affect knowledge hiding behavior; self-efficacy, outcome expectation, and community atmosphere negatively affect the three different types of knowledge hiding behavior, which are evasive hiding, playing dumb, and rationalized hiding; community atmosphere positively affects outcome expectation, which plays a significant intermediary effect between community atmosphere and knowledge hiding behavior. The research content and relevant conclusions of this study deepen and expand the connotation and extension of knowledge hiding behavior in the negative performance of Q&A communities. From the perspective of practical application, it can also effectively reduce knowledge hiding behavior, grasp the development direction of public health needs, and strengthen the dissemination of epidemic prevention and control knowledge.

## 1. Introduction

At the beginning of 2020, the COVID-19 spread rapidly around the world, bringing a crisis and inconvenience to every individual in the society, causing public panic and anxiety, and greatly stimulating the public's demand for health information [1], thus triggering an upsurge of information search on socialized Q&A communities. Socialized Q&A communities are based on communities, user relations, and content operation, emphasizing users' social relations and self-generated content [2]. With the rapid

development of network technology, as the emerging interactive platform with the characteristics of communication convenience, communication flexibility, variety, and timeliness of knowledge, socialized Q&A communities, has ushered in its era of rapid development and is gradually becoming an important place for people to acquire daily knowledge and share opinions. In the socialized Q&A communities represented by "Zhihu," users can share and obtain the information they need by searching, browsing, asking questions, commenting, or answering relevant questions; among them, we searched the keyword "epidemic

prevention and control” under the topic column and found that the problem data have accumulated more than 50,000. Therefore, user interaction is the basis of information or knowledge exchange in socialized Q&A communities, and stable user interaction is the guarantee of the normal operation and sustainable development of socialized Q&A communities [3].

The increased public demand for online platforms for health information generated by this outbreak has become a challenge to successfully retain users and motivate them to contribute effective information to Q&A communities. Even for a successful Q&A community, most people only pay attention to personal preference information and rarely focus on other people’s questions, which plays a relatively passive role [4]. Under the topic of epidemic prevention and control on Zhihu, although there are a lot of questions, the discussion and interaction on the topic are relatively small. Some users choose to hide or ignore the questions even though they know the answers, which leads to the emergence of knowledge-hiding behavior. Knowledge hiding is a conscious and purposeful behavior of hiding information, retaining knowledge answers, or refusing to answer directly [5], which will lead users to reduce their efforts and scientific level in knowledge sharing, hinder the transmission of new knowledge and the development of new ideas [6], hinder the knowledge mobility among users and sustainable healthy development of socialized Q&A communities, and affect the public’s access to health information in the post-epidemic era. Knowledge hiding behavior has serious harm, but it is not an optimal solution to shut down the community just because of the knowledge hiding behavior of some users, which can bring trouble and unfairness to users who are still contributing high-quality answers to the community. Therefore, this study takes finding the influencing factors of knowledge hiding behavior as the research motivation and provides an effective reference for the optimization of socialized Q&A communities to further understand users’ preferences and intentions [7], which is conducive to further enhancing the competitiveness of the communities, effectively grasping the laws and characteristics of public health information demand in the post-epidemic era, and providing a reference for relevant government departments and socialized Q&A communities to better serve the public.

In recent years, more and more scholars have studied the negative behaviors in socialized Q&A communities. As one of the users’ negative behaviors, knowledge hiding behavior has attracted more attention than before. However, few studies focus on the combination of public health needs and knowledge hiding behavior in the post-epidemic era. In terms of research status, scholars’ research balance on knowledge hiding and knowledge sharing is still inclined toward knowledge sharing [8], for example, Shi et al. [9] and Zhao et al. [10] have conducted studies on this. The research on knowledge hiding is mainly concentrated in organizations, companies, and employees, and the knowledge hiding survey from the perspective of Q&A communities is relatively missing, which makes the theories in the research field lack corresponding theoretical support in the actual research situation. Therefore, to explore the influencing factors of

users’ knowledge hiding behavior in the Q&A communities in the post-epidemic era, this study takes “Zhihu” as the research platform, which is highly active in China’s socialized Q&A communities and has representative users, which takes epidemic prevention and control as a research topic, applies social cognitive theory, and empirical analysis methods to explore the synergistic effects of self-efficacy, community atmosphere, outcome expectation, and request on knowledge hiding behavior, among them, self-efficacy and outcome expectation, as a form of self-assessment, belong to individual subjective judgment; community atmosphere and request as the external characteristics, refer to the environment gradually formed in the community, which can affect users. Thus, this study selects these factors as research variables to reveal the key influencing factors of users’ knowledge hiding behavior and then puts forward suggestions to reduce users’ knowledge hiding behavior. The research of this study is conducive to improving users’ participation in the socialized Q&A communities, thus promoting and maintaining a virtuous circle of the community. It is conducive to creating a fair and open community environment, promoting mutually beneficial information exchange behavior of users, and guiding users to share knowledge. It is of great significance to enrich the user behavior theory of socialized Q&A communities and strengthen the connection between the community and users.

## 2. Related Research Studies

**2.1. Knowledge Hiding Behavior.** Connelly et al. [11] sorted out the concept of knowledge hiding behavior by studying the reasons behind the unsuccessful knowledge sharing and clearly defined knowledge hiding behavior as the intentional act of retaining, hiding, or refusing to give knowledge, the structure of knowledge hiding behavior is explored through empirical study, and believes that there are three dimensions: evasive hiding, playing dumb, and rationalized hiding. Among them, evasive hiding means that the knowledge concealer provides irrelevant information to the inquirer to replace the information which is needed, which delays time and gives misleading promises but does not provide help; playing dumb refers to the behavior of the knowledge concealer pretending not to understand the knowledge they ask; and rationalized hiding means that the person who conceals knowledge gives a valid reason as to why he cannot provide the knowledge. This kind of concealment behavior is not deceptive. According to Nielsen [12], the “90-9-1” rule of unequal participation prevails in Q&A communities, 90% of users are divers who never express their opinions, 9% are occasional contributors, and 1% are experts who provide most of the community’s content. This indicates that most users in Q&A communities only browse knowledge and do not actively participate in knowledge sharing, showing a tendency for knowledge hiding.

It is very important to distinguish between knowledge hiding and knowledge sharing. Knowledge hiding is not only a lack of sharing but its motivation may have many different reasons, and the lack of knowledge sharing may only be due

to the lack of knowledge itself. Therefore, the two are not opposed to each other but are two conceptually different structures [11]. Therefore, knowledge hiding behavior has gradually been a concern for scholars who have carried out targeted research with rich research results. For example, Nguyen et al. [13] developed a conceptual framework based on resource conservation to study knowledge hiding behavior and its consequences; its purpose was to deal with the problem that employees may engage in knowledge hiding to maintain their resources and competitive advantage due to organizational crisis under COVID-19. Fauzi [14] used the systematic literature review method to conduct quantitative research on employees' knowledge hiding behavior and regarded it as immoral and antisocial behavior, which is considered to be detrimental to team development. Jafari-Sadeghi et al. [15] applied the DEMATEL to sort out the causal relationships between knowledge hiding components and provided a conceptual framework. Huang [16] explored the influence of overqualification on knowledge hiding by constructing an intermediary model, which showed that employees' sense of excess qualification negatively affects knowledge hiding. This study enriches the mechanism and boundary conditions of excess qualification and knowledge hiding. Li and Ke [17] conducted an empirical study on the influencing factors of users' knowledge hiding behavior in Q&A communities, from three aspects of personal characteristics, situational atmosphere, and knowledge characteristics to analyze the seven factors that affect knowledge hiding behavior, and put forward valuable suggestions for improving the degree of knowledge exchange in virtual communities. Lu et al. [18] conducted a study on the grouping of knowledge hiding behaviors in socialized Q&A communities based on FsQCA and explored the reasons for users' knowledge hiding behaviors; this research is of great significance to enrich the relevant theories of user behavior in socialized Q&A communities.

Moreover, in terms of the reasons for knowledge hiding, Hamza et al. [19] focused on the mediating role of team member exchange (TMX) and examined the influence of personality traits and individual ethnicity on knowledge hiding behavior. The study found that openness, conscientiousness, neuroticism, and ethnicity are positively correlated with knowledge hiding, while TMX as a mediator transforms this positive correlation into a negative one. Anand et al. [20] thought personal beliefs or situational constraints cause knowledge hiding, and identified the driving factors that lead to knowledge hiding. Among them, situational driving explained the reasons as to why performance and competition lead to unconscious hiding: psychological ownership driving leads to controlled hiding, hostility and abuse driving from employees or managers lead to victimization hiding, and identity and norms driving lead to preference hiding. Alam et al. [21] believed that negative emotions are a major cause of knowledge hiding, in which relationship conflict positively affect knowledge hiding, and frustration regulates the relationship between relationship conflict and knowledge hiding to a certain extent.

By analyzing the existing literature on knowledge hiding behavior, it is found that as important emerging platforms

for information sharing and acquisition, socialized Q&A communities have few research achievements on it. Users, as the main producers of information and content in socialized Q&A communities, are key factors to promote the sustainable and healthy development of the communities, so the prevalence of knowledge hiding in the communities will inevitably have a negative impact on the development of the communities. On the one hand, knowledge hiding seriously undermines the knowledge creativity of the virtual academic community, reduces the influence of the community [22], and breaks the good academic atmosphere in the community; on the other hand, knowledge hiding reduces users' own knowledge creativity and also affects the willingness of other users in the community to share knowledge, which eventually leads to the vicious development of the communities.

In summary, exploring the influencing factors of users' knowledge hiding behavior not only enriches the user behavior theory of socialized Q&A communities but also contributes to the healthy development of communities. Due to the imperfect community standard system in the socialized Q&A communities and less offline communication of users, the behavior of users in the communities is more affected by personal factors, and there are also environmental factors affecting the behavior of users in the communities. In addition, Meng et al. [1] took "Zhihu" as an example, used the LDA theme model to build a coding system for users' health information needs, and revealed the characteristics and evolution rules of users' health information needs from the dimensions of time and demand theme. The research study found that the health information needs of Internet users in the post-epidemic period mainly focused on the knowledge related to COVID-19, epidemic prevention and control, and social impact, among which the core demand of users was "epidemic prevention and control." Therefore, this study takes the post epidemic era as background, takes the topic of epidemic prevention and control on "Zhihu" as a theme, and explores the users' knowledge hiding behavior in socialized Q&A communities from the perspective of individuals, combined with external environmental factors.

**2.2. Social Cognitive Theory.** Social cognitive theory (SCT) is derived from Bandura's social cognitive learning theory, which holds that individual behavior is affected by its factors and external environmental factors such as environment and atmosphere. Therefore, the dynamic interaction relationship between behavior, individual, and environment constitutes its core view, that is, the "Triadic Theory" model [23]. The "Triadic Theory" model holds that the interaction of two factors will affect people's motivation, emotion, attitude, and behavior. Flavell proposed that the object of social cognition is human events, which are the cognition of people and their behavior. Fang [24] proposed that social cognition is people's understanding of themselves and others. Shi [25] believed that social cognition is a process in which individuals speculate and judge the psychological state, behavioral motivation, and intention of others. At present, the research

study based on the perspective of social cognitive theory mainly focuses on knowledge-sharing behavior in enterprises, group organizations, and virtual communities. For example, Hsu et al. [26] proposed a knowledge-sharing model based on social cognitive theory, which includes self-efficacy, outcome expectation of personal impact, and multidimensional trust of environmental impact. Cai and Shi [27] discussed the potential mechanisms of community atmosphere on willingness to share knowledge in virtual communities based on social cognitive theory. This study is the first to explore whether and how the community atmosphere affects knowledge sharing and provides practical insights on how to use the community atmosphere to promote knowledge sharing in the Q&A communities. Zhan and Xiong [28] discussed the intermediary role of moral evasion in the spectator response of uncivilized behavior based on social cognitive theory, which is conducive to deepening the understanding of uncivilized behavior.

As a mature theory, the social cognitive theory has been widely used to understand and predict individual and group behavior characteristics. Based on interactive determinism, social cognitive theory proves that there is a causal relationship between individual, environment, and behavior, in which individual and environment can jointly affect or even determine the occurrence of individual behavior. Through the framework of social cognitive theory, this study divides the influencing factors of knowledge hiding behavior in socialized Q&A communities into environmental factors and individual factors. Therefore, users' personal behavior motivation can be well explained by social cognitive theory. Thus, because of the knowledge hiding behavior which is prevalent in the socialized Q&A communities and based on the perspective of social cognitive theory this study explores and effectively extracts the influencing factors of knowledge hiding behavior from this theory.

### 3. Research Hypothesis and Model Construction

Based on social cognitive theory, this study explores the influencing factors of knowledge hiding behavior by combining individual cognitive and external environmental factors. According to SCT, self-efficacy and outcome expectation belong to individual cognitive factors (subjective feelings and expectation judgments), which influence the individual behavior. In addition, external environmental factors and requests, as indispensable factors in socialized Q&A communities, also have some influence on user behavior.

#### 3.1. Research Hypothesis

**3.1.1. Self-Efficacy.** Self-efficacy refers to people's beliefs about what they need to do to complete a task or achieve a goal, that is, the degree of confidence that an individual can use the skills they possess to achieve the desired behavior [29]. Self-efficacy has an impact on what decisions individuals make and what behaviors they adopt; thus, self-

efficacy is an important factor that potentially influences knowledge hiding behavior. As Nielsen [12] said, the Q&A community has 1% of experts who provide most of the high-quality content. When users have high self-efficacy, it means that such users have relatively high response ability and knowledge reserve levels. They feel confident about the content they contribute and do not shy away from hiding their knowledge, which makes such users become this kind of "1%." In recent years, the research methods of self-efficacy are mainly empirical research, and the research content mainly focuses on three themes: education, organization, and knowledge behavior [30]. Among them, in the existing studies that take self-efficacy as a factor to discuss its impact on users' knowledge behavior, Lee et al. [31] tested multiple mediating effects of self-efficacy between knowledge sharing and sustainable well-being, and the results showed self-efficacy positively mediated the relationship between knowledge sharing and sustained well-being. Yang and Li [32] believed that the higher the self-efficacy, the more confident is one of their own ability and valuable contribution to the virtual communities, and the more willing they are to promote knowledge sharing. Zhao and Li [33] tested the hypothesis that self-efficacy has a direct positive impact on knowledge-sharing behavior. According to SCT, individuals are more motivated to do things they know with full confidence and ability and pay less effort for things they are not sure about. Liu and An [6] showed that employees with high self-efficacy positively affect knowledge hiding behavior. Similarly, this shows that if a user's self-efficacy is low and does not believe that he or she is competent enough to answer questions related to epidemic prevention and control in the communities, then the user will not show positive knowledge-sharing behaviors and instead will present knowledge hiding behaviors, which would mean deliberately ignoring or avoiding the questions asked by others. Accordingly, the following hypothesis is formulated:

H1: Self-efficacy negatively affects knowledge hiding behavior

H1a: Self-efficacy negatively affects evasive hiding

H1b: Self-efficacy negatively affects playing dumb

H1c: Self-efficacy negatively affects rationalized hiding

**3.1.2. Outcome Expectation.** Outcome expectation refers to an individual's beliefs about the consequences of behavior he or she will take. As mentioned above, Hsu et al. [26] incorporated the outcome expectation into the knowledge-sharing model of the social cognitive theory. Because knowledge sharing and knowledge hiding are almost similar, this study takes the outcome expectation as one of the research variables to discuss the hypothesis between it and knowledge hiding. Based on SCT, positive expectations are regarded as incentives, because individuals often act according to the standard of self-interest. Therefore, we realize that individuals in the Q&A communities will implement knowledge sharing only when their expectations are met. At present, in the existing research on the impact of the outcome expectation on users' knowledge behavior,

Constant et al. [34] found that knowledge sharing behavior occurs when the benefits of the user's knowledge sharing behavior are comparable or exceed the initially expected reward. Bock et al. [35] confirmed that sharing behavior can be promoted when individuals receive benefits. The research conclusions of two scholars confirm that there is a positive impact between outcome expectation and knowledge sharing. In addition, Tang and Mao [36] found that individuals actively share their knowledge to gain respect from others by using the hierarchical regression method but when they feel isolated and threatened, they tend to reduce their knowledge-sharing behavior. This coincides with the research conclusion of Zhang et al. [37] and Dai [38], that is, the outcome expectation negatively affects knowledge hiding behavior. Similarly, in the socialized Q&A communities, users will tend to adopt a positive attitude towards knowledge-sharing behavior if they feel recognition and respect from other users; if users feel their knowledge-sharing behavior brings less expected reward or harms their interests, then users will tend to reduce or stop this behavior, that is, they tend to exhibit knowledge hiding behavior when they perceive bad outcome expectation. Accordingly, the following hypothesis is formulated:

H2: Outcome expectation negatively affects knowledge hiding behavior

H2a: Outcome expectation negatively affects evasive hiding

H2b: Outcome expectation negatively affects playing dumb

H2c: Outcome expectation negatively affects rationalized hiding

**3.1.3. Community Atmosphere.** The community atmosphere is a relatively enduring characteristic associated with the community environment [39]. Many studies have explored knowledge-sharing behavior based on the perspective of organizational atmosphere, for example, Fu et al. [40] used the grounded theory to conduct exploratory research on the connotation structure and antecedents of the community atmosphere and pointed out that the individual's perception of the atmosphere is highly related to the individual's output. Kim and Park [41] concluded that organizational atmosphere directly affects knowledge sharing. Similarly, Li and Ke [17] and Lu et al. [18] have also studied the impact of external environmental characteristics on knowledge hiding. In the socialized Q&A communities, the community atmosphere is mainly manifested in the user's cognition of the importance of self-identity and the sense of community belonging. The better the community atmosphere, the more responsible and interested users feel in contributing knowledge [42]. This suggests that a good community atmosphere is conducive to a positive community state, strengthening trust and connection among members, which in turn promotes members' knowledge-sharing activities. This study focuses on three dimensions of community atmosphere: reciprocity, trust, and fairness.

Reciprocity refers to users contributing their knowledge to learn and use new knowledge returned by other users in the future [43]. Based on SCT, reciprocity indicates that there is no unremunerative altruistic behavior between individuals. For the common survival and development of the group, individuals will form a variety of interest relationships with each other [44]. Currently, there is a large body of research studies that argue for a relationship between reciprocity and knowledge sharing. For example, Lin [45] investigated the role of extrinsic (expected organizational rewards and reciprocity) and intrinsic (self-efficacy) motivators in knowledge-sharing intention, which found reciprocal benefits significantly affect employees' attitudes and willingness to engage in knowledge-sharing behaviors. According to SCT, since there is a causal relationship between individuals and the environment, stable communication between users is often based on reciprocal exchange behaviors. When users are full of continuous reciprocal behaviors, they can maintain their trust and dependence on each other, thus producing positive knowledge contribution behaviors. As mentioned above, a good reciprocal atmosphere can reduce the occurrence of knowledge-hiding behaviors in the communities.

Trust, as one of the basic elements of socialization, is a manifestation of users' willingness and beliefs, including their perceptions of sincerity, reliability, kindness, and justice [46]. Trust is the basis for user communication and cooperation within socialized Q&A communities. The establishment of trust can deepen the sense of identity and coordinate conflicts among users, thus promoting the sharing of information within communities [47]. Looking at the literature on trust and knowledge sharing, it can be found that the research is mainly divided into three categories [48]: the first category focuses on empirical research and uses survey data to analyze the impact of trust on knowledge sharing. For example, Chi et al. [49] divided trust into member trust and community trust, constructed a theoretical model of the impact of virtual community governance mechanism with trust as an intermediary variable on knowledge sharing behavior, and found that member trust and community trust play a significant mediating role, respectively; the second category focuses on theoretical research and theoretically analyzes the impact of trust on knowledge sharing. For example, Lin et al. [50] pointed out that trust in both the goodwill dimension and capability dimension strongly affect knowledge sharing; the third category is game research. For example, Zhang et al. [51] integrated trust and knowledge-sharing evolutionary game into the same framework and pointed out that cognitive trust plays an important role in knowledge contribution. In socialized Q&A communities, users will gradually develop trust as they interact with each other's information and thus believe that someone will lend a helping hand in a time when they need help. In addition, trust as a complex and multidimensional concept has led scholars to classify trust factors into different dimensions for analysis. Among them, Hsu et al. [26] believed that trust belongs to external environmental factors, which is the user's subjective feeling toward the community. This study agrees with Hsu's points

of view and based on this division of trust, the trust dimension in the community atmosphere is understood as users' trust in sharing information and the spirit of unity and fraternity in the socialized Q&A communities. In summary, a good trust atmosphere will motivate users to actively participate in knowledge sharing and thus reduce the occurrence of knowledge hiding behaviors.

Fairness refers to users' perception that the community treats themselves and others equally and without prejudice. Users often have a psychological perception of organizational fairness through the reasonable distribution of material resources or remuneration with other members [52]. Hao [53] took enterprise employees as the research subject and found that the advancement of knowledge-sharing behavior is constrained by inequities within the organization. According to SCT, the unfair environment reduces the user's identification and emotional attachment to the community, hinders the communication between users, reduces the probability of the occurrence of reciprocal behaviors, and thus leads to the increase of knowledge hiding behaviors. Accordingly, the following hypothesis is formulated:

H3: Community atmosphere negatively affects knowledge hiding behavior

H3a: Community atmosphere negatively affects evasive hiding

H3b: Community atmosphere negatively affects playing dumb

H3c: Community atmosphere negatively affects rationalized hiding

As the community atmosphere is a reflective structure based on the low-level structure of reciprocity, trust, and fairness, so the item of community atmosphere is composed of these three factors. According to Becker et al. [54], the research model based on the concept of more than second order can be selected by two methods, the repeated index method and the two-stage method. The repeated index method is used in this study, and it cites that all the indicators of each LOC belonging to the HOC are designated as the reflective measurement indicators of HOC when constructing the model. As an HOC, the community atmosphere forms a second order with LOC of reciprocity, trust, and fairness, while they form the first order with their nine projects (shown in Table 1). Therefore, the community atmosphere will be set as a measurement index with nine reflections.

Meanwhile, a good atmosphere of reciprocity, trust, and fairness enables users to perceive the degree of value to be obtained in the future, thus enabling them to accurately judge the outcome expectation. Therefore, a good community atmosphere can promote the outcome expectation of users' knowledge sharing. Accordingly, the following hypothesis is formulated:

H4: Community atmosphere positively affects outcome expectation

Among them, outcome expectation, as an intermediary variable, indirectly transmits the influence of community

atmosphere to knowledge hiding behavior, playing a transmission role. A good community atmosphere enables users to perceive the value obtained in the future and then enables users to accurately judge the outcome expectation. With accurate outcome expectations, users will tend to strengthen the trust and contact among members, thus, promoting knowledge sharing. In other words, the community atmosphere positively affects outcome expectation, and outcome expectation negatively affects knowledge hiding behavior, that is, the community atmosphere indirectly has a negative impact on knowledge hiding behavior by influencing outcome expectation. Accordingly, the following hypothesis is formulated:

H5: Outcome expectation plays a mediating role between community atmosphere and knowledge hiding behavior

*3.1.4. Request.* In the post-epidemic era, the requests for knowledge and socialized Q&A community services have changed greatly. In the socialized Q&A communities, the most original and basic needs should be the users' requests for knowledge, which is also the most basic purpose for users to enter the online knowledge community. Requests are the premise and foundation for carrying out knowledge service activities [61], and insight into users' knowledge requirements in the current context is fundamental. Zhang et al. [62] analyzed the causes, levels, and characteristics of requests and found that in the socialized Q&A communities, users' requests for knowledge are the premise to promote the occurrence of knowledge behaviors such as questioning, querying, and acquiring, which determine the content, mode, and future development direction of the knowledge service. Based on the openness of the online community, users can publish their knowledge requests in the community anytime and anywhere. However, openness also brings the problem of a lack of unified planning and management, resulting in an unbalanced and inadequate knowledge supply and knowledge requirements satisfaction in Q&A communities [63]. When the standards required by users for knowledge cannot be met, users tend to hide their efforts when participating in knowledge activities, making their knowledge-sharing efforts lower than the level they can fully share, forming knowledge hiding behavior. Accordingly, the following hypothesis is formulated:

H6: Request negatively affects knowledge hiding behavior

*3.2. Research Model Construction.* Based on the above-mentioned research hypotheses, this study proposes a research model on the influencing factors of knowledge hiding behavior in socialized Q&A communities based on social cognitive theory, as shown in Figure 1. Taking self-efficacy and outcome expectation as individual perception variables, combined with community atmosphere and request, this research work studies the influencing factors of knowledge hiding behavior in socialized Q&A communities and



TABLE 1: List of questionnaire measurement items.

Variables	Title item	References
<i>Self-efficacy</i>	I think I can bring valuable content related to epidemic prevention and control to other users I think I have a lot to say about relevant knowledge of epidemic prevention and control It makes no difference to me whether other users respond to what I post or not I prefer to answer questions with a high degree of certainty I get a sense of satisfaction and achievement when the knowledge I share is widely recognized When the knowledge I shared receives many likes, the number of quality answers I contribute will increase	[55]
<i>Outcome expectation</i>	When I am praised for the knowledge I share, I feel that I am recognized and respected I am more effective at contributing quality responses when the act of sharing brings the expectation of interpersonal benefit The level of responses I contribute will increase when the act I share brings the expectation of financial gain	[35]
<i>Community atmosphere (reciprocity)</i>	When I answer others' questions in the community, I want others to answer mine too When I share knowledge about epidemic prevention and control, I want to be able to take knowledge from the community as well I think Zhihu is a platform where interests are exchanged I believe there is a spirit of camaraderie and mutual support in the community	[45]
<i>Community atmosphere (trust)</i>	I think you can find a sense of belonging in a community I believe that the knowledge about epidemic prevention and control I have gained from the community is reliable	[56]
<i>Community atmosphere (fairness)</i>	I think what I get is fair compared to how motivated I am to answer questions I think what I get is fair compared to the amount of time I contribute to the community I think it is fair to say that the quality answers I provide are the same as the quality answers I get When the requests for knowledge meet physiological and safety needs, I will improve the knowledge sharing	[57]
<i>Request</i>	When the requests for knowledge meet social needs, I will improve the knowledge sharing When the requests for knowledge meet self-fulfilling needs, I will improve the knowledge sharing	[58]
<i>Knowledge hiding</i>	In the community, when another user asks for knowledge about epidemic prevention and control, I give a response that may not be the information he needs In the community, when other users ask for knowledge about epidemic prevention and control, I refuse to help even if I know the answer In the community, when other users ask for knowledge about epidemic prevention and control, I reply "I will help later" but in reality, it is "I will delay as long as I can." In the community, I prefer to hoard knowledge rather than share it	[59]
<i>Knowledge hiding (evasive hiding)</i>	When someone asks for information about epidemic prevention and control, I will verbally promise to help him but I do not really intend to help him When someone asks for information about epidemic prevention and control, I will agree to help him but will give him a different message When someone asks for information about epidemic prevention and control, I will tell him I will help him in the future but actually, I put it off for as long as possible When I exchange information with other users, although I know some information, I say I do not know	
<i>Knowledge hiding (playing dumb)</i>	When I exchange information with other users, I pretend not to know what they are talking about When other users ask for information about epidemic prevention and control, I explain that the information is confidential and is only visible to specific people	[60]
<i>Knowledge hiding (rationalized hiding)</i>	When other users asked for information about epidemic prevention and control, I say I do not know much about this topic When other users asked for information about epidemic prevention and control, I will tell them I want to tell them, but I cannot	

discusses the impact of three factors in SCT on three different types of knowledge hiding behavior.

**3.3. Questionnaire Design.** This study uses users of Zhihu as the research target. The samples were collected by randomly issuing questionnaires on the Internet. The questionnaire consists of three parts: (1) a basic description of the

questionnaire, which explains the purpose of the research; (2) basic information about the respondents and their basic use of the Zhihu platform; and (3) measurement questions on the research variables, that is, respondents answer questions based on their personal experiences and feelings.

The measurement indicators for this study were taken from existing literature and have been adapted according to the current use of socialized Q&A communities in China

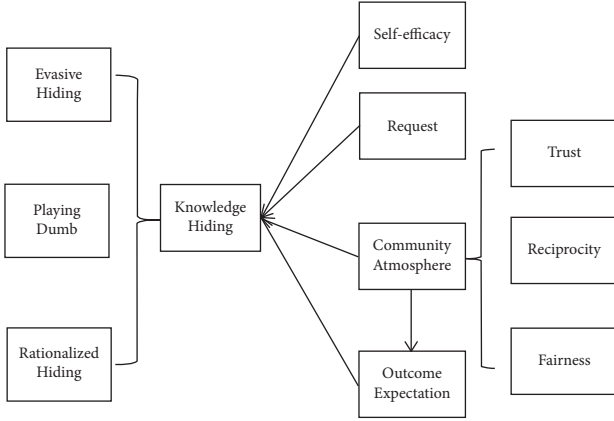


FIGURE 1: research model of influencing factors of knowledge hiding behavior.

and the research content of this study. The questionnaire used a five-level Likert scale to measure variables, corresponding to the level of strongly disapprove, disapprove, neutral, approve, and strongly approve as shown in Table 1.

#### 4. Data Collection and Analysis

**4.1. Sample Collection and Descriptive Analysis.** Considering time cost, economic cost, and other factors, this questionnaire survey was conducted from June 7, 2022, to June 27, 2022. The questionnaire was designed and distributed according to 3.3, after comprehensive consideration of the filling time, filling profile, and filling IP, a total of 151 valid questionnaires were collected within 20 days. The sample size calculation and the information of the target respondents are shown in Table 2.

Descriptive statistical analysis is carried out on the abovementioned survey results to find out the internal rules of these data samples, and further understand the characteristics of the audience groups of this survey through the scientific description and to prepare for the next analysis. The research objects have the following characteristics:

- (1) *Gender characteristics:* in the results of this research, the sample size of males is 81, accounting for 53.6% of the total sample; the sample size of females is 70, accounting for 46.4% of the total sample, relatively speaking, males account for a larger proportion.
- (2) *Age characteristics:* users aged 19–30 account for the highest proportion; such users are generally college students or young people who have just started working. They have more free time and no life pressure, so they may increase investment in entertainment. This is followed by users over 40 years old, whose personal ability tends to be saturated and they can spend more time on the network. Users aged 30–40 account for 12% of the total, such users are generally already working. Because of various factors such as personal thirst for knowledge and social needs, they choose to use online knowledge communities to enrich their personal experience

TABLE 2: Descriptive statistics of knowledge hiding behavior survey.

Item	Category	Frequency (N = 151)	Percentage (%)
<i>Gender</i>	Female	70	46.4
	Male	81	53.6
<i>Age</i>	18 years and under	17	11.3
	19–30 years	91	60.3
	30–40 years	18	12.0
	40 years and over	25	16.4
<i>Educational level</i>	Middle school	3	2.0
	High school	7	4.6
	Technical secondary school or junior college	12	8.0
	Undergraduate	123	81.4
	Postgraduate	5	3.3
	Ph.D. and above	1	0.7
<i>Occupation</i>	Student	108	71.5
	Business or self-employed	31	20.5
	Administrative agency or institution	9	6.0
	Other	3	2.0
<i>Years of using Zhihu</i>	1 year and under	9	6.0
	1–2 years	57	37.7
	3–4 years	58	38.4
	4–5 years	25	16.6
	5 years and over	2	1.3
<i>Average number of posts posted per week</i>	0	93	61.6
	1–5	28	18.5
	6–10	18	11.9
	11–20	12	8.0
	More than 20	0	0
Total		151	100.0

TABLE 3: Overall reliability analysis data.

Cronbach's $\alpha$ coefficient	Standardized Cronbach's $\alpha$ coefficient	Number of items	Number of samples
0.805	0.805	33	151

TABLE 4: KMO test and Bartlett's test.

KMO value		0.905
Bartlett's spherical test	Approximate chi-square	4206.587
	Freedom	595
	Significance	$\leq 0.001$

after their daily work. Users under the age of 18 accounts for the smallest proportion, because these users are minors, and the use of the Internet will be controlled by the family, society, software, and other aspects. These age characteristics reflect the diversity, youth, and inclusiveness of the community.



TABLE 5: Exploratory factor analysis matrix.

Measurement item	Composition									
	1	2	3	4	5	6	7	8	9	10
OE1	0.852									
OE4	0.824									
OE5	0.808									
OE2	0.807									
OE3	0.778									
KH1		0.760								
KH3		0.753								
KH2		0.752								
T3		0.725								
SE3			0.840							
SE2			0.802							
SE4			0.746							
SE1			0.738							
T1				0.843						
T2				0.827						
T3				0.823						
RE3					0.870					
RE2					0.862					
RE1					0.859					
F2						0.872				
F1						0.841				
F3						0.820				
R3							0.830			
R2							0.824			
R1							0.791			
EH1								0.801		
EH3								0.793		
EH2								0.775		
RH1									0.773	
RH2									0.761	
RH3									0.696	
PD1										0.890
PD2										0.821

- (3) *Educational level*: about 85% of the respondents have a bachelor's degree or above, indicating that the users of online knowledge communities are generally well-educated and have a good knowledge reserve.
- (4) *Occupational characteristics*: students account for the highest proportion, followed by people who are engaged in business or are self-employed, among which 71.5% are students and 20.5% are businessmen or self-employed. According to the age structure, the number of users under the age of 18 is small but the overall proportion of users is relatively high among students, indicating that the users who use online knowledge communities are mostly college students, masters, and Ph.D. business employees who have a large base in the social structure, so their proportion is also high.
- (5) *Years of using Zhihu*: 6% of the respondents have used Zhihu for 1 year or less, 37.7% for 1–2 years, 38.4% for 3–4 years, 16.6% for 4–5 years, and 1.3% for more than 5 years, which ensures that the respondents are all users who have used Zhihu. It also shows that the user viscosity of Zhihu is very good, and the average years can reach more than 3 years.

- (6) *The number of posts per week*: most of the Zhihu users in the sample are few replies and posts, and the sample size of users who do not post at all is the largest, accounting for 61.6%. The number of users who post more than 20 posts a week is zero. These data show that the actual activity of users is not high. There are many divers in Zhihu, and only a few users are willing to post and interact in the community, highlighting the potential phenomenon of knowledge-hiding behavior.

#### 4.2. Reliability and Validity Analysis of the Questionnaire.

In this study, the reliability analysis of the questionnaire was conducted by SPSS 25.0 to check the stability of the questionnaire; the validity analysis of the questionnaire was conducted by SPSS and AMOS software to verify the reasonableness of the quantitative data; finally, the goodness of fit of the model was verified by the structural equation model.

**4.2.1. Reliability Analysis.** In general, indicators with good reliability can be repeated under the same or similar

TABLE 6: Evaluation of the model AVE and CR indicators.

Factor	Mean-variance extraction AVE value	Combined reliability CR value
Factor1 (SE)	0.696	0.899
Factor2 (OE)	0.739	0.933
Factor3 (CA)	0.443	0.888
Factor4 (RE)	0.837	0.938
Factor5 (KH)	0.642	0.877
Factor6 (EH)	0.802	0.923
Factor7 (PD)	0.774	0.871
Factor8 (RH)	0.646	0.845

TABLE 7: Pearson correlation and AVE root value.

	SE	OE	CA	RE	KH	EH	PD	RH
SE	0.834							
OE	0.367	0.86						
CA	0.568	0.452	0.666					
RE	0.392	0.352	0.484	0.915				
KH	-0.415	-0.509	-0.541	-0.477	0.801			
EH	-0.505	-0.531	-0.544	-0.387	0.512	0.896		
PD	-0.374	-0.395	-0.429	-0.321	0.352	0.348	0.88	
	SE	OE	CA	RE	KH	EH	PD	RH
RH	-0.474	-0.546	-0.562	-0.383	0.434	0.463	0.349	0.804

The diagonal numbers are the root values of this factor AVE.

conditions to obtain consistent results. When reliability tests are conducted among different respondents and scorers, the higher the consistency of the results obtained, the higher the reliability of the questionnaire. This study adopts Cronbach's Alpha reliability measurement method with high recognition, and according to Kaiser's stipulation of Cronbach's  $\alpha$  [64],  $\alpha$  between 0.5 and 0.6 is not credible. As can be seen in Table 3, the overall reliability of the questionnaire variables is 0.805, which shows that the questionnaire of this study has good reliability, and the scale used has good internal consistency and is relatively reasonable in design.

**4.2.2. Validity Analysis.** The validity analysis includes content validity and construction validity: for content validity, this study refers to published articles and their designed questionnaire items [35, 45, 55–57, 59] and makes some modifications; for construction validity, the degree of interpretation of the actual test results on the measured indicators this study conducts an exploratory factor analysis to questionnaire scales for construction validity testing. Cerny and Kaiser [65] showed that when the KMO value is between 0.6 and 1, and the validity is appropriate and suitable for factor analysis. In this study, the exploratory factor analysis was adopted to test the validity of the

measurement model and the scale, and the KMO test and Bartlett's test table were obtained. According to Table 4, the significance level of Bartlett's spherical test chi-square value is  $\leq 0.001$  and the KMO value is 0.905, which indicates that the scale has good validity and is suitable for factor analysis.

In this study, the factors were extracted based on principal component analysis, and the rotation method adopts the Kaiser normalization maximum variance method and sets the absolute value to 0.5 to estimate the factor load as shown in Table 5. Self-efficacy, outcome expectation, community atmosphere, trust, reciprocity, fairness, request, knowledge hiding, evasive hiding, playing dumb, and rationalized hiding are expressed as SE, OE, CA, T, R, F, RE, KH, EH, PD, and RH, respectively. Generally, the absolute value of factor loadings above 0.4 is considered a significant variable, and above 0.5 is considered a very important variable. As can be seen from Table 5, the factor loadings are all greater than 0.5, indicating that the ten factors extracted are well represented and the factors converge well.

In addition, to further confirm the convergent validity of variables within the factors of this model and to identify validity information, the Fornell-Larcker criteria are used to confirm the results of the model AVE and CR indicators. In general, AVE above 0.5 or CR above 0.7

TABLE 8: Normality test of observed variables.

Observed variables	Skewness		Kurtosis	
	Statistics	Standard error	Statistics	Standard error
SE1	-0.230	0.197	-0.999	0.392
SE2	0.077	0.197	-1.656	0.392
SE3	-0.207	0.197	-1.139	0.392
SE4	0.076	0.197	-1.214	0.392
OE1	-0.050	0.197	-1.497	0.392
OE2	-0.082	0.197	-1.530	0.392
OE3	-0.219	0.197	-0.886	0.392
OE4	0.026	0.197	-1.496	0.392
OE5	-0.148	0.197	-1.354	0.392
R1	-0.367	0.197	-1.277	0.392
R2	-0.235	0.197	-1.488	0.392
R3	-0.366	0.197	-1.123	0.392
T1	0.017	0.197	-1.581	0.392
T2	0.032	0.197	-1.602	0.392
T3	0.043	0.197	-1.630	0.392
F1	-0.223	0.197	-1.656	0.392
F2	-0.323	0.197	-1.332	0.392
F3	-0.217	0.197	-1.400	0.392
RE1	-0.155	0.197	-1.679	0.392
RE2	-0.178	0.197	-1.656	0.392
RE3	-0.225	0.197	-1.304	0.392
KH1	0.085	0.197	-1.392	0.392
KH2	0.213	0.197	-1.353	0.392
KH3	0.263	0.197	-0.935	0.392
KH4	0.470	0.197	-1.112	0.392
EH1	0.197	0.197	-1.579	0.392
EH2	0.283	0.197	-1.208	0.392
EH3	0.178	0.197	-1.681	0.392
PD1	-0.340	0.197	-1.291	0.392
PD2	-0.432	0.197	-1.249	0.392
RH1	0.120	0.197	-1.221	0.392
RH2	-0.155	0.197	-1.396	0.392
RH3	-0.135	0.197	-1.498	0.392

indicates high convergent validity and good construct reliability. The Fornell-Larcker criteria require that the square root of the average variance extracted for a variable should be greater than its highest correlation with any other variable. According to Tables 6 and 7, it can be seen that the degree of extraction of the measures within the factors is excellent and the first-order variables in the model meet this requirement.

#### 4.3. Model Fit Analysis and Hypothesized Results

**4.3.1. Normality Test.** Normal distributions are used in many scenarios. In general, the study of normality test methods can be based on the following directions: normality tests based on statistical plots, normality tests based on empirical distribution functions, and normality tests based on skewness and kurtosis [66]. In this study, a normality test based on skewness and kurtosis was chosen to verify the normality of the multivariate data and to determine whether AMOS analysis could be performed.

TABLE 9: Multicollinearity test results.

Elements	Collinearity statistics	
	Tolerance	VIF
SE	SE1	0.438
	SE2	0.291
	SE3	0.362
	SE4	0.490
OE	OE1	0.279
	OE2	0.308
	OE3	0.422
	OE4	0.283
	OE5	0.343
CA	R1	0.445
	R2	0.306
	R3	0.401
	T1	0.281
	T2	0.211
	T3	0.228
	F1	0.230
	F2	0.273
RE	F3	0.340
	RE1	0.213
	RE2	0.178
	RE3	0.313
KH	KH1	0.445
	KH2	0.428
	KH3	0.532
	KH4	0.440
EH	EH1	0.278
	EH2	0.351
	EH3	0.224
PD	PD1	0.422
	PD2	0.398
RH	RH1	0.475
	RH2	0.456
	RH3	0.457

When the skewness coefficient is less than 3 and the kurtosis coefficient is less than 8, the data follow a normal distribution, otherwise, it does not obey the standard normal distribution [67]. As can be seen from Table 8, the skewness coefficients for all variables in this model are less than 3 and the kurtosis coefficients are less than 8, so these data are normally distributed and can be used for the AMOS analysis.

**4.3.2. Multicollinearity Diagnosis.** To test the multicollinearity problem of the current model, this study performs an analysis of multiple linear regression on the variables. In the regression model, the variance inflation factor (VIF) provides a measure of collinearity. If  $VIF < 5$ , there is essentially no collinearity; if VIF exceeds 10, multicollinearity exists. According to Table 9, one of the VIF values is greater than 5, which is because the survey object is only for Zhihu users and there are certain restrictions on the basis and scope of the sample, and the basis of data collection is not wide enough. However, on the whole, the values of the independent variable multicollinearity test index VIF of this model are far below 10, which indicates that there is no multicollinearity between the independent variables, and the

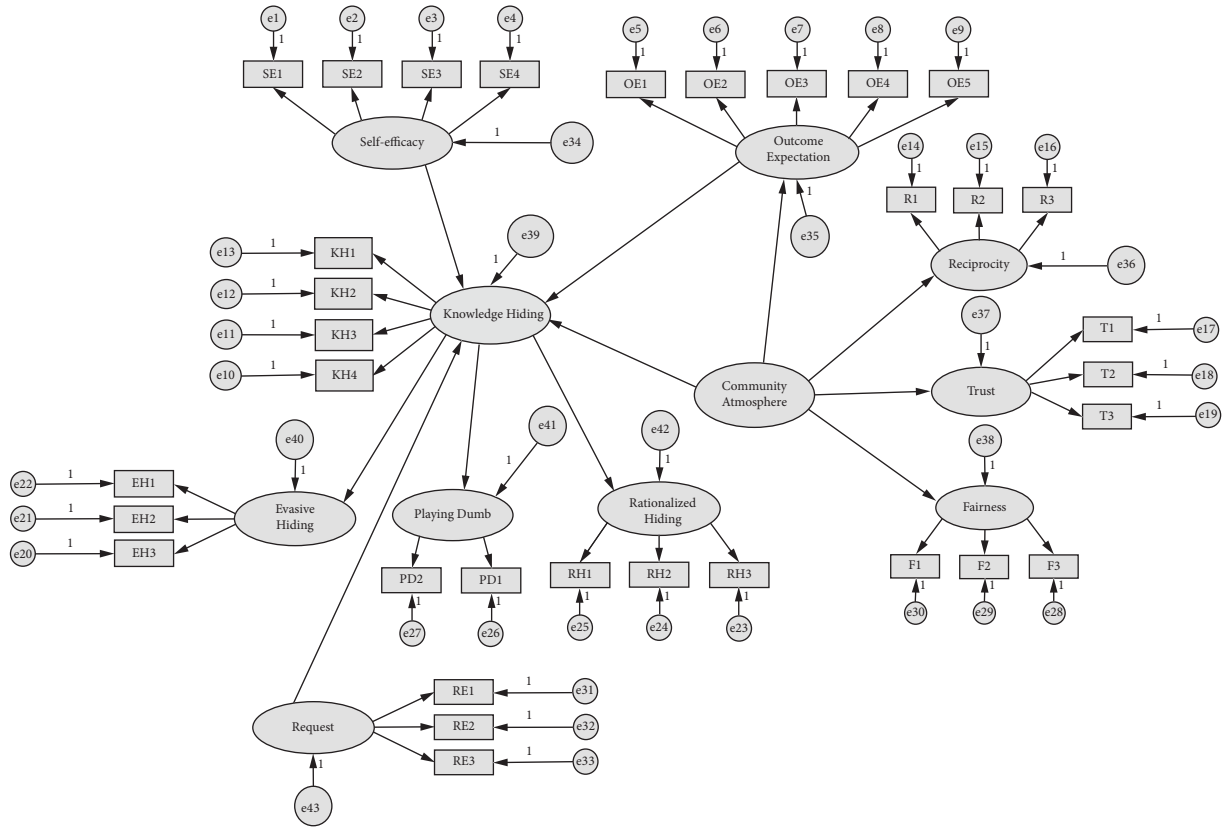


FIGURE 2: The structural equation model.

TABLE 10: Model fitting indicators.

	Statistical test volume	Name	Adaptation criteria	Test result data	The model fits or not
Absolute fit index	$\chi^2/df$	Chi-square degrees of freedom ratio	<3	1.995	Fits
	GFI	The goodness of fit index	>0.9	0.977	Fits
	RMSEA	Root mean square error of approximation	<0.1	0.081	Fits
Value-added adaptation index	RMR	Root mean square error	<0.1	0.066	Fits
	CFI	Comparative fit index	>0.9	0.868	Not fits
	NFI	Normed fit index	>0.9	0.927	Fits
	NNFI	Non-normed fit index	>0.9	0.853	Not fits

degree of interaction between them does not affect the accuracy of the analysis of their respective effects, which meets the requirements of the model test criteria.

**4.3.3. Simulation Fit Analysis.** In this study, 151 valid questionnaires are collected and the Amos 24 is imported for the structural equation model analysis. The measurement model of the structural equation model in this study includes 10 latent variables, 33 observation variables, and 43 residual terms. The final model diagram is shown in Figure 2:

As shown in Table 10, this study analyzes the overall fitting index of the model from two aspects: absolute adaptation index and value-added adaptation index through

verification factor analysis. From the data in the table, it can be seen that the index of most aspects of the model is suitable for the evaluation criteria, and the overall goodness of fit is good. A model is acceptable on the premise that multiple of these criteria fit well and cannot be too far from the cut-off values. Therefore, this shows the research model in Figure 2 can evaluate the research question of influencing factors of knowledge hiding behavior in socialized Q&A communities, and it can be considered that the fit of this model is acceptable.

**4.3.4. Hypothesis Test Results.** In this study, the path analysis of the structural equation model is used to

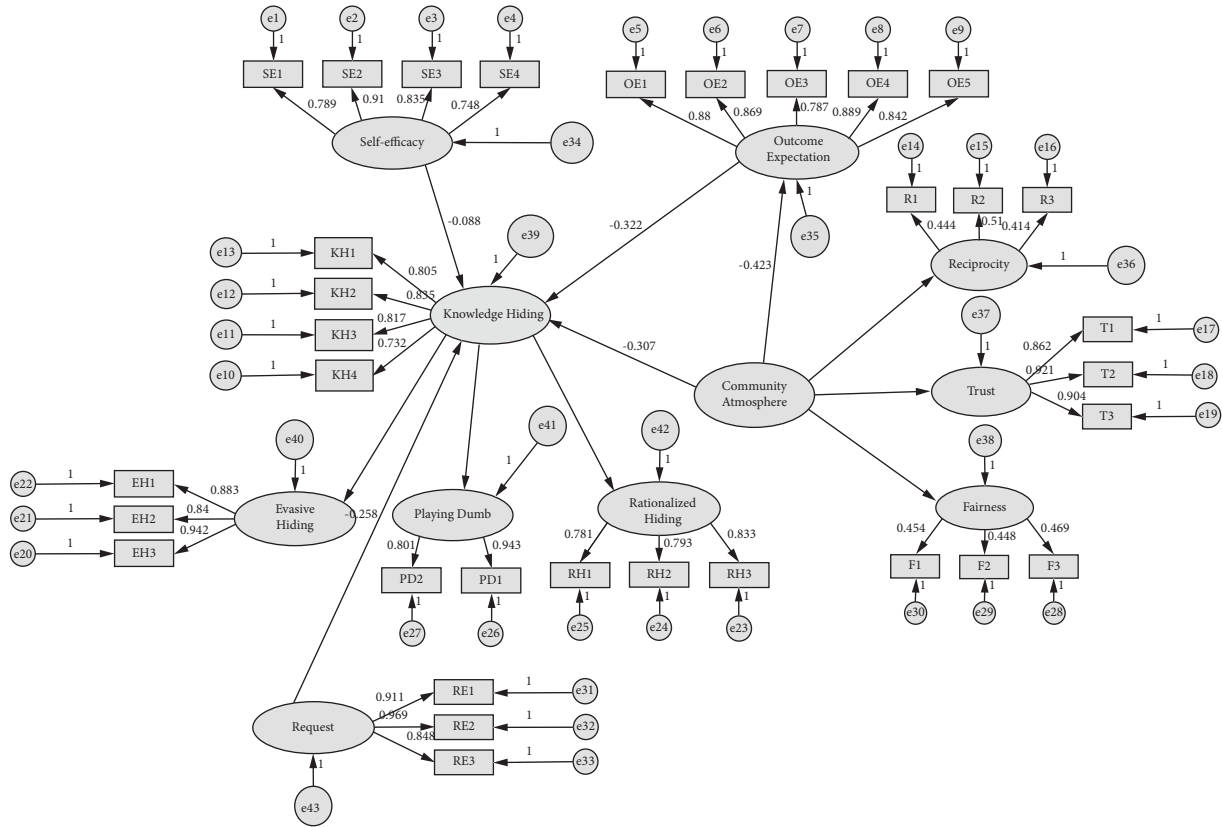


FIGURE 3: structural equation model normalized path coefficients.

TABLE 11: Hypothesis test results.

Hypothesis	Path	Path coefficient	P value	Test result
H1	Self-efficacy $\rightarrow$ knowledge hiding	-0.088	0.298	Not established
H1a	Self-efficacy $\rightarrow$ evasive hiding	-0.316	$\leq 0.001$	Established
H1b	Self-efficacy $\rightarrow$ playing dumb	-0.193	0.042**	Established
H1c	Self-efficacy $\rightarrow$ rationalized hiding	-0.257	0.003***	Established
H2	Outcome expectation $\rightarrow$ knowledge hiding	-0.322	$\leq 0.001$	Established
H2a	Outcome expectation $\rightarrow$ evasive hiding	-0.379	$\leq 0.001$	Established
H2b	Outcome expectation $\rightarrow$ playing dumb	-0.259	0.004***	Established
H2c	Outcome expectation $\rightarrow$ rationalized hiding	-0.423	$\leq 0.001$	Established
H3	Community atmosphere $\rightarrow$ knowledge hiding	-0.307	0.002***	Established
H3a	Community atmosphere $\rightarrow$ evasive hiding	-0.202	0.026***	Established
H3b	Community atmosphere $\rightarrow$ playing dumb	-0.251	0.020**	Established
H3c	Community atmosphere $\rightarrow$ rationalized hiding	-0.261	0.008**	Established
H4	Community atmosphere $\rightarrow$ outcome expectation	0.423	$\leq 0.001$	Established
H6	Request $\rightarrow$ knowledge hiding	-0.258	$\leq 0.001$	Established
H5	Community atmosphere $\rightarrow$ outcome expectation $\rightarrow$ knowledge hiding		$\leq 0.001$	Established

\*\*\*, \*\*, \* represent the significance levels of 1%, 5%, and 10%, respectively.

calculate the standardized path coefficients between potential variables. As shown in Figure 3, by studying the standardized path regression coefficients between model variables, the causality hypothesis of each potential variable of the knowledge hiding model is verified, and the results of the hypothesis verification are more intuitively and clearly explained.

As can be seen from Table 11, the hypothesis proposed in this study is partially valid and the research model of knowledge hiding behavior constructed indicates that outcome expectation, community atmosphere, and request negatively affect knowledge hiding behavior; self-efficacy, outcome expectation, and community atmosphere and all of these negatively influence the three different types of

knowledge hiding; there is a positive effect between community atmosphere and outcome expectation, with outcome expectation mediating significantly between community atmosphere and knowledge hiding behavior. The  $P$  values indicate that the model is significant at all path levels and all paths are valid (except H1).

## 5. Conclusion

Based on social cognitive theory, this study establishes a research model of the influencing factors of users' knowledge hiding behavior in socialized Q&A communities. Six hypotheses are proposed through the analysis of literature on knowledge hiding. In this study, the influencing factors of knowledge hiding behavior are divided into four aspects: self-efficacy, outcome expectation, community atmosphere, and request where the community atmosphere is split into three dimensions of reciprocity, trust, and fairness. Moreover, it explores the influence of the three factors of SCT on the three types of knowledge hiding behavior, namely, evasive hiding, playing dumb, and rationalized hiding. Knowledge hiding behavior of "Zhihu" users in epidemic prevention and control under the background of post-epidemic era is studied through multiple factors, and the structural equation model is used to verify the model. Five of the six hypotheses in the model are significantly supported.

- (1) The results show that outcome expectation, community atmosphere, and request negatively affect users' knowledge hiding behavior. As Constant et al. [34] and Fu et al. [40] believe, users' personal output is related to their perceived environment and perceived benefits. When users are in an environment with a low sense of fairness, reciprocity, and trust, and think that the benefits brought by their efforts are not higher than expected; then, they often lose their willingness to share, which is consistent with the research conclusion of Gu [68] and Han [69]. In addition, different from previous studies, this study expands on the influencing factors of knowledge hiding behavior and finds that request also negatively affects knowledge hiding. Users' knowledge requirements for epidemic prevention and control topics are often based on reliability and authenticity, and they hope that the acquired knowledge can play a defensive role. When these requirements cannot be met, users will lose their desire to share and communicate, hide their knowledge, and form knowledge-hiding behavior. According to Xie [70], promoting situational regulation and controlling the community atmosphere play a good role in regulating knowledge hiding. Therefore, to improve users' participation in the socialized Q&A communities, it is suggested that promoting and maintaining a virtuous circle of positive reciprocity in the

community and actively paying attention to meeting user requirements are vital, so that users can fully trust and rely on the community. Knowledge-sharing behavior should be promoted by improving the organizational reward mechanism [71], thus it is suggested that the community regularly reward users who actively share knowledge publicly so that users feel respected and recognized. Certain rewards will also become the motivation for users to actively share knowledge.

- (2) The results show that self-efficacy, outcome expectation, and community atmosphere negatively affect evasive hiding, playing dumb, and rationalized hiding. On one hand, according to the definition of knowledge hiding's three types from Connelly et al. [11], the occurrence of different types of knowledge hiding behavior may be affected by external incentives and user's benefits. If users lack formal contractual relationships or certain external incentives, they will not have a high willingness to share. When other users in the community ask questions, users will consciously expect to be in a mutually beneficial state. Once this does not happen, they may hide knowledge and automatically make evasive behavior. On the other hand, when answering other people's questions, some users with low self-efficacy will reduce the expectation of successfully contributing knowledge in the network knowledge space to avoid disappointing results, which leads to the occurrence of three types of knowledge hiding. The insecurity of the environment affects knowledge hiding through emotional exhaustion [72]. Hence, a fair and open environment in the communities should be ensured and monitoring channels for community managers and service providers should be established. At the same time, for some divers, the community can set appropriate restrictions, such as reading permission restrictions, to effectively reduce the users' knowledge hiding behaviors.
- (3) The results show that community atmosphere positively affects outcome expectation, and outcome expectation plays a significant intermediary effect between community atmosphere and knowledge hiding behavior. According to Bandura's social cognitive theory [29], environmental factors have a certain impact on individual factors. Outcome expectation is an individual behavior, and users will make a subjective judgment on whether their input is directly proportional to their income. When users first enter the community, they are not sure whether they can get the same return through knowledge sharing because the new environment is



unfamiliar, and they do not receive any benefit from it. Based on the mentality of mutual benefit, the user's expected reward is 0, so the user will be more inclined to knowledge hiding behavior at the beginning. When users have a deeper understanding of their community atmosphere, if the community atmosphere itself is not ideal, that is., there is a fraud, inadequate incentives, and uneven distribution of material resources, people may hold a negative attitude toward reciprocity. Therefore, they are not willing to trust others easily, and their expectation of knowledge sharing also decreases. On the contrary, when the user is in an atmosphere with a strong sense of fairness, trust, and reciprocity, they will have a good expectation of the consequences of sharing knowledge. Then, the user will spend more time in Q&A communities and will be more willing to share knowledge rather than hiding knowledge. A good community atmosphere will strengthen the communication and contact between users, thus affecting users' judgment of the outcome expectation [39]. Moreover, with the communication between users, the reciprocal exchange behavior between them becomes more and more frequent, users believe that when they need help, others will take the initiative to lend a helping hand so as to achieve a satisfactory response. This will encourage both sides to produce sustained and stable knowledge sharing and contributory behavior. These findings explain the mediating effect of outcome expectation between community atmosphere and knowledge hiding behavior, and this conclusion is consistent with the research conclusions of Zhu et al. [73].

- (4) The results of the model data rejected the original hypothesis H1, that is, self-efficacy negatively affects knowledge hiding behavior which is contrary to the results. This is due to the anonymity and high openness of the Q&A community. Users can hide their true identity and speak freely during use. Therefore, even if the user has a low sense of self-efficacy and does not have enough confidence to provide high-quality answers, anonymity will add a protective film to the user's psychology, thereby reducing the impact of self-efficacy on knowledge hiding. In addition, the result of this hypothesis is also related to the fact that the users of the questionnaire may not be strict with the way they handle the questionnaire, or because the questionnaire is aimed at a small number of users and only represents the views of some people.

This study synthesizes the previous research studies on knowledge hiding in a socialized Q&A community based on the social cognitive theory, expands its influencing factors to request, and expands the research boundary and theoretical

knowledge related to knowledge hiding behavior. It understands and enriches the research on the behavior of the Q&A community from a dual perspective. From the user's point of view, it explores the reasons for knowledge hiding based on the user's thoughts, so as to reduce the chance of knowledge hiding generation by making more users participate in the interaction of the Q&A community, thus promoting the occurrence of knowledge sharing behavior. The reduction of knowledge hiding behavior is also conducive to further promoting the benign development of the Q&A community, so as to create a fair, interactive, and open community environment for users, thereby deepening the connotation and extension of knowledge hiding and strengthening the closeness between users and communities. In terms of health information, this study will help the public to timely master the real-time epidemic prevention and control knowledge, reduce the obstacles that may be encountered in the dissemination of relevant knowledge, help the public accurately grasp the characteristics of public health information needs, and provide an effective reference for the society to better serve the public. It is also of great significance to boost users' usage experience and to optimize knowledge community ecology.

The limitations of this study are mainly reflected in the sample data of the empirical research stage. In the phase of data collection, only 151 valid questionnaires were collected due to the restrictions of time, manpower, and other objective reasons. In the future, we will consider expanding the number of sample size and combining different interview methods, such as focus groups and one-on-one in-depth interviews. In addition, the coverage of the questionnaire in this study is insufficient and the research data are all from Zhihu, which cannot cover all types of communities. The universality of the research results for other Q&A communities needs to be studied. Therefore, further data from multiple platforms should be considered in future research studies to explore the applicability of research results and enhance the credibility of the research study. In addition, knowledge hiding is also closely related to team structure. The heterogeneity between users will affect the size of the difference. When the difference is small, knowledge hiding may also be affected. Therefore, in future research studies, we should pay more attention to diversity. At the same time, this study has less discussion on the three types of knowledge hiding. In the future, we should increase the discussion on the connotation and dimensions of knowledge hiding behavior and more comprehensively discuss whether users' knowledge hiding behavior is active or passive in order to strengthen the consideration of "tacit knowledge." [74].

## Data Availability

The data that support the findings of this study are available from the corresponding author upon reasonable request.

## Conflicts of Interest

The authors declare that they have no conflicts of interest.

## Authors' Contributions

Conceptualization and methodology was done by J. -F. C. and X. F.; formal analysis was conducted by J. -F. C. and W. -Z. L.; the project was supervised by Q. Y.; project administration was handled by X. F. and W. -Z. L.; the original draft was prepared by J.-F. C. All authors have read and agreed to the published version of the manuscript.

## Acknowledgments

This research was funded by the National Natural Science Foundation of China (No. 11905042), Natural Science Foundation of Hebei Province (No. G2021203011), and Project of Social Science Development of Hebei Province (No. 20210501003).

## References

- [1] Q. Q. Meng, H. X. Xiong, and Z. R. Yang, "Analysis on the health information needs and evolution of Internet users in the post epidemic period," *Library Magazine*, vol. 41, pp. 119–127, 2022.
- [2] J. J. Li and S. L. Guo, "Influencing factors of knowledge adoption behavior of users in socialized Q&A community from the perspective of cognition -- an exploratory analysis based on grounded theory," *Information Science*, vol. 40, pp. 91–98, 2022.
- [3] Y. Chen, L. Wang, and T. Y. Chen, "Research on user portrait of socialized Q&A platform based on social network analysis," *Journal of Information*, vol. 40, pp. 414–423, 2021.
- [4] J. Gao and X. X. Wang, "Study on the influence of harmonious state experience of network community members on diving intention," *Nankai Management Review*, vol. 30, p. 1, 2021.
- [5] Y. Tian, Q. L. Cao, and L. H. Mao, "Research on the theoretical origin and core content of organizational knowledge hiding," *Technical Economy and Management Research*, vol. 42, pp. 57–62, 2021.
- [6] H. Liu and L. R. An, "Research on the impact of expected return and knowledge power perception on employees' knowledge hiding behavior," *Scientific Decision*, vol. 28, pp. 81–89, 2021.
- [7] L. Shi, G. Song, G. Cheng, and X. Liu, "A user-based aggregation topic model for understanding user's preference and intention in social network," *Neurocomputing*, vol. 413, pp. 1–13, 2020.
- [8] M. M. Shi, "Research on the influencing factors of knowledge sharing behavior of virtual learning community members from the perspective of social cognition," *China's Collective Economy*, vol. 34, pp. 54–55, 2018.
- [9] Z. Shi, D. R. Lin, and L. Ding, "The impact of workplace negative gossip on hotel employees' willingness to share tacit knowledge," *Tourism Tribune*, vol. 37, pp. 108–120, 2022.
- [10] X. Q. Zhao, Q. Q. Wang, and Q. Cai, "An analysis of knowledge sharing behavior characteristics of opinion leaders in online Q&A community: a case study of Zhihu "Travel" topic," *Information Science*, vol. 39, pp. 68–74, 2021.
- [11] C. E. Connelly, D. Zweig, J. Webster, and J. P. Trougakos, "Knowledge hiding in organizations," *Journal of Organizational Behavior*, vol. 33, no. 1, pp. 64–88, 2011.
- [12] J. Nielsen, *The 90-9-1 Rule for Participation Inequality in Social media and Online Communities*, <https://www.nngroup.com/articles/participation-inequality/>, 2006.
- [13] T. M. Nguyen, A. Malik, and P. Budhwar, "Knowledge hiding in organizational crisis: the moderating role of leadership," *Journal of Business Research*, vol. 139, pp. 161–172, 2022.
- [14] M. A. Fauzi, "A review of knowledge hiding in team: evaluation of critical research streams," *Team Performance Management: International Journal*, vol. 28, no. 5/6, pp. 281–305, 2022, ahead-of-print.
- [15] V. Jafari-Sadeghi, H. Amoozad Mahdiraji, A. Devalle, and A. C. Pellicelli, "Somebody is hiding something: disentangling interpersonal level drivers and consequences of knowledge hiding in international entrepreneurial firms," *Journal of Business Research*, vol. 139, pp. 383–396, 2022.
- [16] Y. Y. Huang, "Research on the mechanism of the sense of excess qualification on employees' knowledge hiding -- a regulated intermediary model," *Operations Management*, vol. 40, pp. 101–109, 2022.
- [17] J. W. Li and Q. Ke, "An empirical study on the influencing factors of users' knowledge hiding behavior in virtual Q&A community," *Journal of Agricultural Library and Information*, vol. 34, pp. 1–15, 2022.
- [18] X. Y. Lu, X. Q. Xu, and X. L. Wang, "Research on knowledge hiding behavior configuration of socialized Q&A community based on FsQCA," *Knowledge Management Forum*, vol. 7, pp. 37–48, 2022.
- [19] M. A. Hamza, S. Rehman, A. Sarwar, and K. N. Choudhary, "Is knowledge a tenement? The mediating role of team member exchange over the relationship of big five personality traits and knowledge-hiding behavior," *VINE Journal of Information and Knowledge Management Systems*, vol. 51, 2021.
- [20] A. Anand, P. Centobelli, and R. Cerchione, "Why should I share knowledge with others? A review-based framework on events leading to knowledge hiding," *Journal of Organizational Change Management*, vol. ahead-of-print, no. ahead-of-print, pp. 379–399, 2020.
- [21] T. Alam, Z. Ullah, F. S. AlDhaen, E. AlDhaen, N. Ahmad, and M. Scholz, "Towards explaining knowledge hiding through relationship conflict, frustration, and irritability: the case of public sector teaching hospitals," *Sustainability*, vol. 13, no. 22, Article ID 12598, 2021.
- [22] L. Zhang, J. A. Pang, and Y. X. Wang, "Research on evaluation of knowledge hiding willingness of researchers in virtual academic community based on SVM," *Information Exploration*, vol. 33, pp. 9–16, 2019.
- [23] D. H. Schunk and M. K. Dibenedetto, "Motivation and social cognitive theory," *Contemporary Educational Psychology*, vol. 60, Article ID 101832, 2020.
- [24] F. X. Fang, "Brief introduction to the development of children 's social cognition," *Psychological Science*, vol. 8, 1986.
- [25] R. H. Shi, *Modern Social Psychology*, East China Normal University Press, Shanghai, 1989.
- [26] M. H. Hsu, T. L. Ju, C. H. Yen, and C. M. Chang, "Knowledge sharing behavior in virtual communities: the relationship between trust, self-efficacy, and outcome expectations," *International Journal of Human-Computer Studies*, vol. 65, no. 2, pp. 153–169, 2007.
- [27] Y. Cai and W. Shi, "The influence of the community climate on users' knowledge-sharing intention: the social cognitive

- theory perspective," *Behaviour & Information Technology*, vol. 41, no. 2, pp. 307–323, 2022.
- [28] X. J. Zhan and T. R. Xiong, "The observed influence of supervisor's uncivilized behavior on employee's uncivilized behavior -- based on social cognitive theory," *Contemporary Finance & Economics*, vol. 41, pp. 92–102, 2021.
  - [29] A. Bandura, "Self-Efficacy: toward a unifying theory of behavioral change," *Psychological Review*, vol. 84, no. 2, pp. 191–215, 1977.
  - [30] W. Y. Zhang and S. Zhu, "Review of domestic research on emotion regulation self-efficacy," *Publica Standardization*, vol. 40, pp. 124–126, 2021.
  - [31] K. C. Lee, I. H. Chang, I. L. Wang, and R. S. Chen, "Effects of knowledge sharing on sustainable happiness of preschool teachers: the mediating roles of self-efficacy and helping behavior," *Current Psychology*, vol. 41, pp. 1–10, 2022.
  - [32] X. M. Yang and X. B. Li, "The influence of big five personality on knowledge sharing in virtual community -- taking self-efficacy as the intermediary variable," *Information Exploration*, vol. 35, pp. 1–6, 2021.
  - [33] H. C. Zhao and X. Q. Li, "Approaches to the influence of perceived overqualification on organizational knowledge sharing behavior - based on the moderating effect of Chinese traditional cultural values," *Journal of Zhengzhou University*, vol. 55, pp. 51–55, 2022.
  - [34] D. Constant, S. Kiesler, and L. Sproull, "What's mine is ours, or is it? a study of attitudes about information sharing," *Information Systems Research*, vol. 5, no. 4, pp. 400–421, 1994.
  - [35] G. W. Bock, R. W. Zmud, Y. G. Kim, and Lee, "Behavioral intention formation in knowledge sharing: examining the roles of extrinsic motivators, social-psychological forces, and organizational climate," *MIS Quarterly*, vol. 29, no. 1, pp. 87–111, 2005.
  - [36] Y. H. Tang and J. H. Mao, "The influence mechanism of individual perception difference and workplace exclusion on knowledge sharing behavior," *Scientific Research Management*, vol. 41, pp. 200–208, 2020.
  - [37] M. Zhang, Z. Ma, and Y. Zhang, "The formation path of users' subjective knowledge hiding behavior in online health community," *Information Theory and Practice*, vol. 41, pp. 111–117+53, 2018.
  - [38] Y. G. Dai, *An Empirical Study on the Impact of Knowledge Hiding on Temporary Team Performance*, Chongqing University of Technology, Chongqing, China, 2020.
  - [39] Y. H. Shang, S. Z. Ai, and F. Y. Wang, "An empirical study on knowledge sharing behavior of virtual community members based on social cognitive theory," *Scientific and Technological Progress and Countermeasures*, vol. 29, pp. 127–132, 2012.
  - [40] S. H. Fu, Z. F. Shen, and Y. Y. Jiao, "Research on the connotation, antecedents and consequences of open innovation community atmosphere," *Scientific Research (New York)*, vol. 38, pp. 2293–2304, 2020.
  - [41] E. J. Kim and S. Park, "Transformational leadership, knowledge sharing, organizational climate and learning: an empirical study," *The Leadership & Organization Development Journal*, vol. 41, no. 6, pp. 761–775, 2020.
  - [42] H. Lu, X. X. Zhang, and Y. W. Wu, "Multiple motivations and effects of users' knowledge contribution behavior in professional virtual community," *Library Construction*, vol. 45, pp. 131–140, 2022.
  - [43] J. L. Yin, F. Yang, and N. Wang, "Research on the influence mechanism of perceived community value on consumers' knowledge sharing behavior: the intermediary role of reciprocal norms," *Business and Economic Research*, vol. 40, pp. 36–40, 2021.
  - [44] W. B. Xia, J. Zhai, and K. L. He, "Review of Reciprocal Altruistic Behavior in Supply Chain Management," *Journal of Fujian Business University*, vol. 22, pp. 41–47, 2019.
  - [45] H. F. Lin, "Effects of extrinsic and intrinsic motivation on employee knowledge sharing intentions," *Journal of Information Science*, vol. 33, no. 2, pp. 135–149, 2007.
  - [46] X. W. Cao, "Mechanism analysis of the influence of cross-border e-commerce platform empowerment on customer locking: the intermediary effect of customer participation and trust," *Business and Economic Research*, vol. 41, pp. 106–110, 2022.
  - [47] X. H. Dang and Y. L. Sun, "Research on the impact of technological innovation network location on network practices -- taking inter organizational trust as an intermediary variable," *Scientific Research Management*, vol. 34, pp. 1–8, 2013.
  - [48] M. H. Liu, *Research on Knowledge Sharing and protection Based on Evolutionary Game*, Hebei University of Economics and Trade, Hebei, China, 2022.
  - [49] M. Chi, X. H. Bi, and Y. S. Xu, "Research on the impact of governance mechanism of mobile academic virtual community on knowledge sharing behavior -- taking trust as the intermediary variable," *Management Review*, vol. 33, pp. 164–175, 2021.
  - [50] T. Lin, S. M. Zhang, and W. W. Han, "A meta-analysis of the differences in the effect of trust on supply chain knowledge sharing," *Business and Economic Research*, pp. 9–12, 2019.
  - [51] Y. Zhang, R. Zhang, Q. Ma et al., *ISA Transactions*, vol. 100, pp. 210–220, 2020.
  - [52] D. H. Yang, H. T. Xie, and Y. Q. Dong, "The influence path of knowledge-based leadership on knowledge sharing behavior of scientific research team members -- a Study on the mediating effect of social exchange and the moderating effect of organizational justice," *Technology and Innovation Management*, vol. 42, pp. 409–416, 2021.
  - [53] Y. R. Hao, *Research on the Occurrence Mechanism of Employees' Knowledge Sharing Behavior Based on Fairness Perception*, Hebei University of Economics and Business, Hebei, China, 2021.
  - [54] J. M. Becker, K. Klein, and M. Wetzels, "Hierarchical latent variable models in PLS-SEM: guidelines for using reflective-formative type models," *Long Range Planning*, vol. 45, no. 5–6, pp. 359–394, 2012.
  - [55] C. J. Chen and S. W. Hung, "To give or to receive? Factors influencing members' knowledge sharing and community promotion in professional virtual communities," *Information & Management*, vol. 47, no. 4, pp. 226–236, 2010.
  - [56] J. B. Rotter, "A new scale for the measurement of interpersonal trust1," *Journal of Personality*, vol. 35, no. 4, pp. 651–665, 1967.
  - [57] J. A. Colquitt, "On the dimensionality of organizational justice: a construct validation of a measure," *Journal of Applied Psychology*, vol. 86, no. 3, pp. 386–400, 2001.
  - [58] M. Yi, J. J. Song, and B. Yang, "Research on user demand hierarchy of network knowledge community," *Information Science*, vol. 35, pp. 22–26, 2017.
  - [59] F. Lin and H. Huang, "Why people share knowledge in virtual communities? The use of Yahoo! Kimo Knowledge+ as an example," *Internet Research*, vol. 23, no. 2, pp. 133–159, 2013.

- [60] H. L. Li and L. R. An, "Review of research on knowledge hiding behavior in organizations," *Financial Economy*, vol. 37, pp. 178-179, 2018.
- [61] W. Liang, Z. P. Lu, and G. F. Liu, *Research on Maker Knowledge Needs Based on Grounded Theory*, Library Information Work, vol. 62, , pp. 10-17, 2018.
- [62] X. X. Zhang, Z. M. Li, S. L. Guo, and Q. Social, "A community users 'knowledge needs and their dynamic evolution," *Information Theory and Practice*, vol. 41, pp. 38-44+50, 2018.
- [63] M. Li, Y. Li, and Q. Zhou, "Knowledge supply and demand in network Q & A community based on TF-PIDF," *Data Analysis and Knowledge Discovery*, vol. 42, pp. 106-115, 2021.
- [64] H. F. Kaiser, "An index of factorial simplicity," *Psychometrika*, vol. 39, no. 1, pp. 31-36, 1974.
- [65] B. A. Cerny and H. F. Kaiser, "A study of a measure of sampling adequacy for factor analytic correlation matrices," *Multivariate Behavioral Research*, vol. 12, no. 1, pp. 43-47, 1977.
- [66] J. F. Hair and B. J. Black, *Multivariate Data Analysis*, Prentice-Hall, Upper Saddle River, 2014.
- [67] A. Akpınar, *Factors Influencing the Use of Urban Greenways: A Case Study of Aydın, Turkey*, Urban Forestry & Urban Greening, vol. 16 , pp. 123-131, 2016.
- [68] K. Gu, *Research on Influencing Factors of Knowledge Hiding Behavior of Users in Virtual Community*, Shandong University of Finance and Economics, Shandong, China, 2018.
- [69] R. Han, *Research on the Influence Mechanism of Organizational Injustice on Knowledge Hiding*, Jilin University, China, 2021.
- [70] W. Y. Xie, *Research on the Influence of Organizational Motivation Atmosphere on Employees' Knowledge Hiding Behavior*, Xi'an University of Architecture and Technology, Xian, China, 2021.
- [71] Y. Y. Su, C. Fu, and F. Y. Wei, "How to reduce knowledge hiding behavior in organizations," *China Social Sciences Journal*, vol. 20, 2022.
- [72] M. Li, "Research on the influence mechanism of job insecurity on employees' knowledge hiding," *Operations Management*, vol. 40, pp. 1-15, 2022.
- [73] H. Y. Zhu, W. T. Cao, and J. Chen, "The influence of class atmosphere on medical students' knowledge hiding -- the mediating effect of interpersonal trust," *Journal of Medical Informatics*, vol. 43, pp. 53-58, 2022.
- [74] J. M. Wang, *Sample Size Calculation*, 2020, <https://wenku.baidu.com/view/71aead7efb0f76c66137ee06eff9aef8951e4859.html>.