

# Analysis of Influencing Factors about University Teachers' Knowledge Collaboration

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**Abstract**—Knowledge collaboration would not only increase the teacher ability, but also enhance the competitiveness of the university. Because different knowledge collaboration team has different operational efficiency, the paper analyzes the factors that influence the university teachers' knowledge collaboration through questionnaire survey. The research is carried out in three aspects: the collaborative knowledge, cooperative teachers and the collaborative environment. It was found that sharing tacit knowledge, teachers' cooperative ability and willingness, cultural atmosphere and organizational management all affect the efficiency of knowledge collaboration. The paper uses the "cause and effect diagram" for summary so as to take effective measures to promote efficiency of knowledge collaboration timely.

**Keywords**—university teachers, knowledge collaboration, influencing factors

## I. INTRODUCTION

The former editor of the *Knowledge Management*—Karlenzig proposed the concept of knowledge collaboration in the first time, and though it is the basic way to create organization values and attain win-win between the collaboration agents<sup>[1]</sup>. According to the predecessors' views, Chinese scholar Zhiping Fan (2007) believed that knowledge collaboration was a cooperative knowledge activity, which is composed of a number of organizations, teams and individuals, so as to optimize the value of knowledge resources and realize the knowledge innovation<sup>[2]</sup>. As we know, the knowledge is multi-dimensional and scattered in every individual teacher in the university. In order to avoid "the knowledge hoarding", the knowledge identification and sharing has become the key issues. Higham (2013) pointed out that knowledge collaboration was an important factor that affects the quality of teaching, research and social service in a university<sup>[3]</sup>.

The goal of university knowledge collaboration is to acquire, transfer, share and integrate knowledge, to increase the value of knowledge through the knowledge spillover effect, at the same time, the teachers' individual capital and organizational capital would be improved, the ability of the teacher's knowledge innovation would also be promoted. Knowledge collaboration is a complex system, in order to

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This work was financially supported by the project of Fuzhou University(14SKQ03):Study on transferring teachers human capital to organization capital.

achieve the "1+1>2" goal, many scholars have made a great works to analyze which factor lead to collaborative success. Many previous views were summarized as follows: The influencing factors of knowledge collaboration involve three aspects, the cooperative object, collaborative subject and collaborative environment. Among them, the elements of cooperative object include the knowledge stock and their character of complementary and the compactness of collaborative goal, as well as the coding of tacit knowledge. The collaborative subject contains teachers' cooperating willingness, absorption and spread abilities. The elements of environments include university's strategic vision, organizational structure, management system, cultural atmosphere and technology platform, etc.

All of these factors will influence the collaborative activities' direction, depth, breadth and speed. In order to find the main reason, we especially choose the key university—FZ University (in China) as the object of study. We would find the teachers current situation through the questionnaire survey, and grasp the main factors that affect the university knowledge collaboration, so we could put forward some beneficial methods to improve transfer efficiency about teachers' human capital to university organization capital. The survey issued 300 questionnaires, both online and offline, the actual recovery was 256, the recovery rate was 85.33%, excluding the incomplete answers, the final copies contain 231, the effective questionnaire rate was 77%. The results of the investigation showed as follows.

## II. KNOWLEDGE COLLABORATION OBJECT—TACIT KNOWLEDGE TRANSFER ASKS FOR HARMONIOUS COOPERATION

The collaboration object is knowledge, which is the raw material of team synergy and the final product as well. The explicit knowledge could be spread among teachers by face-to-face communication, book reading or internet method etc., whereas the tacit knowledge only could be obtained within practical work, the shared scope was really limited. Therefore, we need to design the questionnaire to know the state of knowledge sharing in the university. The feedback about the relationship between the teachers was shown in Table 1.

Knowledge sharing between teachers would help to upgrade the level of the university. Because every teacher is different, their values and the understanding of things are not

the same, so the aspiration of knowledge collaboration is not consistent with others. If teachers do not trust each other or not believe that others will contribute their valuable knowledge in a work team, the level of trust in community is low. In other words, there would be less sharing of tacit knowledge, not to mention cooperation and innovation. In this survey, as to mutual help, 25% of the teachers give a positive answer (Q1), 40% think that if they felt convenient and had free time, they would like to help people in need. Only 20% would be willing to devote their knowledge to the team, and 45% also reach a certain degree understanding on cooperation (Q2), but we could not know whether the cooperative willingness would lead to cooperative behavior.

TABLE I. THE QUESTIONNAIRE SURVEY AND FEEDBACK OF THE COLLEGE TEACHERS RELATIONSHIP

Q1. When colleagues face difficulties, would you like to give a responses or help?			
Option	A be sure	B in convenience	C has nothing to do
Ratio	25%	40%	35%
Q2. Are you willing to devote yourselves to the team and think that only cooperation can bring knowledge innovation?			
Option	A be pleasure	B at times	C just finish own work
Ratio	20%	45%	35%
Q3. Do your colleagues often have communication about teaching and research skills or experiences?			
Option	A often	B at times	C few
Ratio	20%	35%	45%
Q4. Do you often join activities like dinner, singing and other outdoors in their spare times?			
Option	A often	B at times	C few
Ratio	25%	40%	35%
Q5. The expression of mutual understanding is used to discuss the problem of teachers in the unit.			
Option	A reach an agreement	B occasionally have an understanding	C little understanding
Ratio	8%	32%	60%

Data source: the questionnaires were designed and analyzed by author

In other aspects, as many as 45% of the teachers like maintain alone in the school, and 35% of the teachers think they have only had occasional contact with others, only 20% to answer that they have had a cooperative experience(Q3). And it is only 25% which have been in contact with others constantly after work (Q4). It was clear that, although teachers have recognized the importance of cooperation, but many teachers usually maintain alone, rarely communication and sharing with colleagues about the experience of the teaching and science research, so it is difficult to form a deeper understanding, not to mention knowing others true ideas.

We also observed a phenomenon that scholars would scorn each other and only trust themselves, which lead to misunderstand sometimes and not mention to appreciate others achievements, even despise others. In other words, which means teachers would not be willing to share their tacit knowledge, or to learn other people's tacit knowledge. The conservative mentality is not conducive to the sharing of tacit knowledge. In our research, only less than 10% of the teachers believed they have had a tacit understanding between each other (Q5). It does not help to the transfer and sharing of tacit knowledge, and also not beneficial to contribute teachers' individual knowledge to the university, at the same time, it also means the school's opportunity to complete the important scientific research projects would be lower.

### III. KNOWLEDGE COLLABORATION SUBJECT —TEACHERS' INDIVIDUAL FACTORS INFLUENCE THE EFFICIENCY OF KNOWLEDGE COLLABORATION

The knowledge collaboration subject involves knowledge dissemination and knowledge recipient, knowledge dissemination transfer knowledge so that the recipient could receive. The knowledge recipient would receive knowledge to become their own. Whether knowledge collaboration would be success or not depends on the ability and the willingness of the cooperation with each other. The analysis of teacher cooperation willingness was shown in table1, and the survey about teachers' collaboration ability was shown in Table 2.

TABLE II. THE QUESTIONNAIRE SURVEY AND FEEDBACK OF THE COLLEGE TEACHERS COLLABORATION ABILITY

Q6. Do you have ability to express the related knowledge in speaking or writing?			
Option	A strong	B general	C poor
Ratio	71%	25%	4%
Q7. Are you confident that you have the ability to solve the problems and finish the work?			
Option	A strong	B general	C poor
Ratio	60%	30%	10%
Q8. How about your willingness to cooperate?			
Option	A more competition than cooperation	B more cooperation than competition	C competition
Ratio	50%	8%	42%
Q9. What do you think about teachers grow up?			
Option	A self-ability & school support	B own efforts mainly	C school policy support mainly
Ratio	32%	53%	15%

Data source: the questionnaires were designed and analyzed by author

Confidence is an individual's subjective judgment and speculation on whether he has the ability to complete a task, which determines the choice of behaviors, and the degree of the persistence and effort. Generally speaking, university teachers have doctor's degree and the ability to receive and spread is high. As revealed by the questionnaires, 71% of the teachers believed they had strong expression ability (Q6), 60% were confident in their ability (Q7). As a result, teachers have enough abilities to share ideas with each other, they could do well in knowledge acquisition, sharing, diffusion and creation, and could use knowledge to achieve their goals, and have the ability to put the individual knowledge to the organizational memory through integration<sup>[4]</sup>.

However, because they are immersed in all kinds of examination in their learning career, 42% of teachers think that they learn how to compete with others during the school years, 50% teachers would be more competitive than cooperation, and only 8% of people believe that their cooperation ability and willingness are strong (Q8). Teachers in colleges and universities, through long-term scientific training, should be good at independent thinking which helps to create more research results, but also makes teachers' pay attention to them research and ignore others' achievement, which would product the invisible barriers of teachers' tacit knowledge sharing. Therefore, overconfidence would not useful to the sharing of tacit knowledge.

They tend to stick to their own academic research, not contacting with others. There were 53% of teachers thought personal career growth depended on their own efforts. Beyond that, 32% proposed school policy play an important role in their progress. Only 15% of the teachers thought their success was more related to the school policy (Q9). All these show that teachers believe that their ability could effectively guarantee to complete the task of teaching and research by themselves. However, the high level scientific research project is not possible to complete by individuals, it will achieve by a team or an organization. So we would analysis the knowledge collaboration environment factors as follows.

#### IV. KNOWLEDGE COLLABORATION ENVIRONMENT —ORGANIZATIONAL ENVIRONMENTAL INFLUENCE THE REALIZATION OF ORGANIZATIONAL CAPITAL

In view of the property right of human capital, the university needs to construct a favorable environment for knowledge sharing and collaboration<sup>[5]</sup>, in order to improve the efficiency of knowledge collaboration, transfer teacher individual knowledge into organizational capital to realize innovation goal. The paper would analyze the knowledge collaborative environment, including the organization system, organization structure, organization culture and so on. The questionnaires and statistics analyses are shown as Table 3.

TABLE III. THE QUESTIONNAIRE SURVEY AND FEEDBACK OF THE COLLEGE TEACHERS COLLABORATION ENVIRONMENT

<b>Q10. What type of organizational structure do you think make for the cooperation and innovation between teachers?</b>			
Option	A Hierarchy team	B Matrix team	C Collaborative team
Ratio	4%	32%	64%
<b>Q11. What kind of culture do you think is the most beneficial to the knowledge sharing and collaborative innovation among teachers?</b>			
Option	A Tolerant culture	B Democratic Culture	C Innovative culture
Ratio	18%	45%	37%
<b>Q12. Does your unit have been built the interior information exchange system?</b>			
Option	A Has been built & used for business communication	B built but for daily communication	C built but useless
Ratio	25%	63%	12%
<b>Q13. Why won't you involve into your work?</b>			
Option	A Dissatisfaction with the pay and condition	B Part-times jobs	C Not capable of scientific research
Ratio	50%	35%	15%
<b>Q14. What is your main reason to work in a university?</b>			
Option	A Like to engage in Teaching	B Like to engage in scientific research	C Working free with holiday
Ratio	35%	35%	30%
<b>Q15. Do you think that your work is paid for the corresponding return?</b>			
Option	A more than expected	B general	C not reach the desired target value
Ratio	10%	30%	60%
<b>Q16. What do you think of the strict performance appraisal is advantage to the knowledge coordination?</b>			
Option	A yes, because of the evil of human nature	B should be force & soft	C no, human nature is good
Ratio	24%	30%	46%
<b>Q17. What do you want to attain after a task?</b>			
Option	A material award	B leadership reorganization	C promotion
Ratio	40%	10%	50%

Data source: the questionnaires were designed and analyzed by author

From question 10-11, 64% of the teachers think that the collaborative team is the most benefit for cooperation, 32% of the teachers chose the matrix team, only a few number people choose the hierarchical team. At the same time, 45% of people think that democratic culture is the most favorable for knowledge sharing and innovation. This is due to the strict grade of the hierarchy team which hinder the members' communication would fix teacher in the narrow scope of work place; it is difficult for teachers to break through the constraints to achieve the communication and collaboration widely. Obviously, the inherent disadvantages of the hierarchical system cause the obstacles of tacit knowledge sharing.

And many teachers thought that they were among in hierarchical team, lacking of democratic atmosphere. we found, from question 12, only 25% of the teachers have used the interior information exchange system for teaching and researching communication, while 63% of the teachers for daily communication. If the utilization ratios of internal information network and library resource are low, the knowledge exchange and sharing would be hindered between teachers.

Within the production process, the effective rate of the material capital would be reached 100% in the normal state; however, the human capital's effective is not as constant as the material capital. Because the teacher's job performance is not only depends on his ability but his effort. We know that the usage of human capital needs to match the environment; otherwise, the effective would be decreased. From question 13 to 14, we found half of the teachers are not satisfactory with their treatment, which indicated it is necessary to create a good working environment for the university normal operation. It also shows that 30% choose to work as a teacher because of the freedom, 35% think that the flexible work system is easy to have part-time jobs. So the university should be good at identifying qualified teachers for fear that freedom spread unchecked.

With the question 15, 60% of the teachers think that their work do not match the desired income; for the problem 16, 46% of the teachers do not agree the implementation of strict performance appraisal, which causes the tension and indifference of the teacher's interpersonal relationship, would not help for knowledge sharing<sup>[6]</sup>. In order to maintain their advantage in the group, avoid becoming the "loser", teachers would not share with others, as a result, the individual knowledge can't be effectively translated into organizational knowledge. From question 17, 40% teachers want to obtain the reward after the tasks, there are 10% hope to be recognized and praised from the leadership, and 50% of people want to get a promotion. This shows that the material and spiritual incentives are of great significance to stimulate the enthusiasm of teachers.

#### V. CONCLUSIONS

In summary, we can conclude the factors that influencing the Teachers' Knowledge Collaboration as "causal analysis diagram", also called at the "fishbone diagram"<sup>[7]</sup>, which is shown in figure1. The "head" of the fish represents the consequences of problem, the fishbone represents the possible influencing factors, it could help us to explain how the various

factors interact with each other, which could help to find the root cause of the problem.

We use the "fishbone" to summarize all kinds of factors about university teachers' knowledge collaboration. From the picture, as for the subject of knowledge collaboration, teachers usually lead to be conceited because they have high professional title and high degree. Dealing with the science research and teaching activities, they would like to be independent and lack of cooperation. Moreover, due to the differences of individual personality characteristics, their evaluation about knowledge collaboration are mixed, also lead to uncooperation, not to mention the sharing of tacit knowledge and producing new creative achievements. As far as the university environment is concerned, the organization design is still lack of flexibility, the communication channels are not perfect, the cultural atmosphere also need to create, management measures also need to be improved. Building a high level university needed to achieve a high level of cooperation between teachers. On the basis of analysis of the relevant factors which influence knowledge collaboration, the corresponding measures are put forward. Such as, establishing knowledge collaboration team and designing the corresponding system would encourage teachers to contribute themselves to team work. This research on questionnaire design, investigation and analysis, as well as the cause and effect analysis is undoubtedly pointing out the direction for the following study.

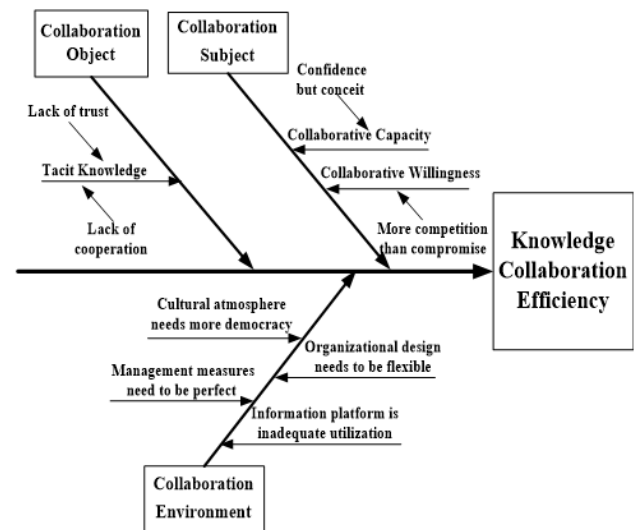


Fig. 1. Knowledge collaboration influence factor chart Source of information: the author design.

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