What Is Happening with the Learner's Identity of the ICT College Majors: A China Experience

Xing Qingqing

School of Foreign Languages, Beijing Institute of Technology, Beijing, P.R. China

Email address:
qqxing@bit.edu.cn

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Abstract: Based on the social exchange theory and a social network analysis method, this paper analyzes the influence exerted by learner's learning network on academic achievement among ICT learners at one Chinese university. It is found that the top students have more centrality in the instrumental network and social capital network. It is proposed that more attention should be paid to the relationship between learners in the learning network, and learning communities should be fostered to improve the independent learning ability of learners in the learning network. The data collected and analyzed over the period of the study also shows that the "class" or "grade" organizational structure in Chinese universities has positive implications for the students identities.

Keywords: Social Exchange, Social Network Analysis, ICT Majors, Learning Community

1. Introduction

While Information Communication Technology is being increasingly understood as the driving force in social changes, its importance and influence on pre-service practitioners' identities and their own learning practices, seems to be overlooked in many ICT (Information Communications Technology) learner's programs. This lack of in-depth discussion on the philosophical and practical issues surrounding ICT students' identity in the 21st century, is a critical oversight especially in contexts where educational reform is most needed. China is such a context. China plays a significant role within the ICT segment in that it has become a major supplier and a fast growing market in the world. At the same time, during the process of the fast development of ICT, higher education in China has also transformed from elite education to mass education. It has become a major concern for educational practitioners to cultivate more independent learners.

It is commonly acknowledged that peer effect plays an important role in teenager's behaviors. Is it worth being studied in college? University education usually displays a feature of "individualization" to guide learners: In the classroom, university learners acquire knowledge through teachers. Outside the classroom, they pursue knowledge in isolation. The university also asks learners to take the examination individually as the way of evaluation, and most teachers are used to focusing on scientific research and knowledge teaching, instead of showing the learners their own way of "how to learn". The student should undoubtedly be the "learners". Yet in practice, university education does not give students the identity of "learner". In many cases, students are still being educated, transformed, and shaped. They are passive recipient being influenced by others. To strengthen students' consciousness as an active agent and to encourage them to change from "being asked to study" to "asking for study" is not only an important research direction to improve the quality of higher education, but also an interrogation on the mission of colleges.

Different from most of the countries, the concepts of "class" and "major" are deployed to organize learning groups for university learners in China. Most of in-class learning activities, as well as some after-class activities, are organized within classes or grades. Compared with elementary and secondary education, Chinese college students enjoy more freedom and more flexibility. They learn not only at classrooms, but also among peers when sharing dormitories on campus, which suggests a larger chance of interaction among classmates or dorm mates. It is of great significance to quantify the peer effect on student's leaning behaviors, and if
possible to measure the correlation between peer effect and academic performance.

The learning behavior of university learners is inseparable from their interaction with others. It is more autonomic and social. In a larger space of independent study, as learners share the same major, similar courses, and alike living environment, their learning behavior is easier to be influenced by other behavior subjects in their learning group. Based on years of teaching practice, the researcher finds that the shared collective learning behavior is a highlight of university learning. First, university learners are not isolated. They form learning partnership within and outside the classroom. That is, two or more students cooperate with each other, sharing and exchanging learning resources and information. During the class, learners spontaneously (or follow the requirement of the teacher) conduct cooperative learning. Besides the organized classroom learning, university learners form several different "sub-groups" as well. They share learning materials (class notes, for example) after class; discuss knowledge points before examination, and review the lessons together. These sub-groups have two or more students. Students of the same group can be roommates, fellow-townsman, friends, or of same hobbies. This mutual support always has great impact on individual learning behavior and learning performance. A noteworthy research problem is that, does the learning relationship between learners have influence on their learning effect? In university, class and grade still are important for students to form relatively stable learning groups. For example, in classes with a large number of students, students from the same dormitory, class or major tend to sit close to each other. This phenomenon also commonly occurs in classes of smaller size. Another observed phenomenon is that, the learning behavior of individual learners is closely related to their learning group. For instance, two classes of the same grade tend to show distinct learning style, which can directly affect individual's learning behavior. In response to the same question raised by the same teacher, students of "introverted" class are likely to keep silence. The class is quiet. On the contrary, students of "extroverted" class are likely to express their opinion voluntarily. The class is active. These phenomena suggest that, individual learner build knowledge through the interaction with other learners. They are influenced by their learning group all the time. So, the learning behavior of individual learners is inseparable from their learning group and their interaction with other learners. To study individual's role as a "learner", one must start from his/her relationship with the group. "Who am I?" "Who am I in this group?" "How can I become who I am?" Such questions raised by learners are about constantly changing self-role and role of the group, which should be paid great attention by education researchers.

The aim of this classroom-based study in which 48 ICT majors from a Chinese university participated, was in part to determine if peer effects and college students' academic performance is correlated. It was also aimed at determining how to measure the peer effects among the subjects who are a random sample of the ICT college majors in China. Based on a perspective of social network analysis, the major hypothesis of this paper is: (1) the peer effect and academic performance of the ICT learners is correlated. The peer effect could be measured by the position that learners take in different social networks of the peers; (2) The top ICT learners are more at the central position of the learner's network, with higher centrality and those who have a greater centrality at the learner's network have better academic performance.

2. Literature Review

2.1. Literature Review on Social Learning Theory

Traditional Mental Cognitivism Learning Theory reduces learning to an inner working of the brain and ignores people's learning behavior in the real world, thus has been widely doubted. It cannot describe and explain the relationship between learning process, individual variables and the social environment comprehensively and intuitively. To present this relationship, we must break the traditional stereotype of learning theory and introduce new research method and explanatory frame. Before the 1960s, most research of learning is based on individual's cognitive behavior. This view of learning focuses on the mental mechanism of individual's learning behavior, and pays less attention on the result of social psychology forming in the process of learning and the external factor of learners in the social learning behavior. It is even rarer to study from the perspective of learning groups, to proceed from the social nature of learning, discussing individual's learning behavior in the group, group learning behavior and learners' interactive learning behavior in the group. Individual learner is not onefold or fixed. It is a complex, sometimes even contradictory social identity, changing with different learning behaviors and learners' learning relationship with others. Learning is a sociocultural process. Thus, learners must be put into a specific social cultural and historical context to examine factors such as social culture and interpersonal interaction (e.g. nationality, gender, culture, class, social role, family, peer and teacher-student interaction), from which individual learner's learning behavior can be analyzed intensively [1].

The mainstream of modern learning theory holds views that learning is a practice taking place in the community. Universities shoulder the task to lead learners studying from the outside of a discipline to the inside of one or several disciplines, and thus to turn them from newcomers to practitioners. Learning is a practice concerning the growth of knowledge and the development of mankind. knowledge is participatory; and learning is practical. "Situated learning" is an important concept of social learning theory. This concept is closely related to legitimate peripheral participation in communities of practice. Main dimensions of situated learning are: meaning, identity, community and practice. Action-oriented learning emphasizes individualization, while situated learning highlights the social nature of learning. The process of learning is a process for learners to (re)construct the meaning. Situated learning theory suggests that meaning can
only be constructed under certain social context in which it exists. Learning and socialization are overlapped. It emphasizes learning condition, social dimension and a social structure in communities of learning which can provide newcomers with legitimate peripheral participation. The growth of ability is inclusive. It includes a master of cultural rules in the community of practice.

Situated learning theory emphasizes that knowledge is constructed during people's interaction. It suggests that human's mind and noema are jointly constructed during their practice in the social community. Participation underlines individual's identity (the belief of self), his/her relation with certain community (affiliation) and the way he/she participates in the future. To a large extent, they determine the nature and degree of learning [2]. Knowledge is an activity based on the social context rather than an abstract object, a state constructed during the interaction between individual and environment/individual rather than a fact. It is a process during which people change the participation structure in social and cultural activities. This process promotes understanding and changes participant's role and responsibility.

Scholars take the character of classic literature as an example to analyse "legitimate peripheral participation" in learning. Oliver Twist in Oliver Twist is an example. In his tragic childhood, Oliver plays the apprentice's role of "legitimate peripheral participation" in a criminal gang. After graduation, they work in the laboratory. These scholars believe that graduates model themselves on experts. During the work, they communicate with their colleagues who hold different levels of understanding toward the research work. In this environment, they gradually develop themselves from newcomers to more advanced roles in the research field. Meanwhile, their skills and job expectations also are improved. Graduates learn from role models, mentoring and legitimate peripheral participation during their work.

2.2. Literature Review on Peer Effect

"Cohort effect" is a sociological concept which is widely used in the study of individuals' herd behavior. Peer relationships generated in the peer communication have been an object of interest of many psychologists. Generally, "cohort effect" refers to a change of original behaviour as an individual is affected by one or more people of similar age and status. The impact of "cohort effect" to learners' learning behaviour can be traced to "reference group theory". The concept of "reference group" is first proposed by Hyman. It refers to any individual or group which can be a reference or comparison for individuals in their forming of attitudes, values or behaviours. The earliest study on peer relationships is Newcomb's research on the change of political attitudes of female students in Bennington University after accepting freshman education. Follow-up studies have shown that the attitude of test group is influenced by the reference group, and this kind of influence will remain for a long time (Newcomb 1968; Alvin, Cohen & Newcomb 1991). The unique value of peer relationships for the healthy development of children's sociality, social cognition, self-concept, personality and emotion has been widely recognized (Zou Hong 1999). The reference group may actually exist or is just an imagination. This study only is concerned about the reference group that actually exists.

The research of cohort effect is an emerging hot point in the field of higher education. "Cohort effect" is a hot issue in the research of pedagogical economics. Related researches include the cost of education, tracking and the effect of school voucher. Foreign scholars have studied peer groups’ impact on school’s decision-making [3]. If the economic structure of higher education is considered as an industry, cohort effect eliminates some large and unnormal economic behaviour of college students. Cohort effect can be an effective way of observing students’ quality and resources if it is nonlinear. This difference in quality and resource is the institutional difference of higher education. In addition, the research of cohort effect relates to the interaction between peer quality market and education service market, which is essential to understand the pricing, enrollment and competition of higher education industry. The study on cohort effect among college students starts from Newcomb et al., and continues until the late 1960s. In the 1970s, however, the number of similar researches in the field of higher education decreases significantly. Among them the most striking one is the study of Weidman on the influence of college students’ values. This study uses longitudinal data of students and the data of teachers from the same school. Through analyzing characteristics of students' background, forms of different departments in the university, the feature of interpersonal relationship and the data of students in curriculum and extra-curricular activities, it predicts the change of undergraduates' values. This study confirms the influence of students’ background and indicates that the form of environment created by teachers affects students’ value at school. From the late 1980s to early 1990s, researches of peer group show an upward trend again. Through analyzing a plurality of school-level data, these researches try to draw a conclusion about cohort effect.

3. Research Method

It's worth mentioning that, subjects for this research are the first group of students spending their first two years in the branch campus of M university. Located in the outskirts of Beijing, with few recreational facilities, the new campus is relatively independent and quiet. For safety's sake, the management of students is stricter as well. Therefore, learners spend much time studying in learning groups such as dormitories, classes and grades; the relationship between them is closer than that of learners in the main campus. This is a general phenomenon in universities today as a result of the enrollment expansion of higher education.

The methodology of this study contains both qualitative and quantitative methods. The basic design of this study is as follows: As for the object of study, we select 48 juniors of a university. They are all ICT majors but belong to two different
classes. The reason why "class" (a small learning group) is taken as a unit to study is that, The academic performance of the subjects is measured based on the GPA score and the score for the entrance exam for graduate school. 55 Questionnaires were handed out, and 48 valid copies were collected. 6 in-depth interviews were conducted with the subjects who displayed distinguished academic performance. Data were analyzed with UCINET software within four dimensions: working network, instrumental network, social capital network and emotional support network, the relationship between academic performance (GPA) and the centrality in different networks is then analyze by SPSS.

Due to the limitation of subject number, the result of this study might be taken into consideration within only the range of small samples. However, in reference with the other studies about peer effects on academic performance, the present study is among one of the pioneering work with a perspective of social network analysis.

4. Findings and Discussions

Altogether 307 valued relationships were included in the analysis and the case network consists of 48 subjects (nodes). It is found that most of the subjects (40) believe that peer effect plays an important role in influencing their academic performance and learning behaviors, and that GPA and the core degree of the instrumental network is significantly correlated (at the 0.01 level, the correlation coefficient being 0.373); GPA and the core degree of the individual social capital network is significantly correlated (at the 0.05 level, the correlation coefficient being 0.306). There is no correlation between GPA and the core degree of the working network and that of the emotional network.

Subjects with highest core degrees in the instrumental network tend to have a better academic performance, and comparatively speaking, the top English learners have higher core degree. According to the data analysis and interview findings, the subject with the highest core degree (No. 14. in:11; out:14) in instrumental network tends to be the one who is considered to be "both with better academic performance and emotional supporting ability ". The rest of the subjects with higher core degrees (No. 31; No. 39; No. 40; No. 44; No. 46) in instrumental network all passed the TEM 4, and later were all submitted by graduate schools. Learners with higher core degree tend to be more popular among the peers, and have more learning resources when they need to resort for help.
perspective of participation, learning is the activities of the environment interact with each other, with changes of any one therefore broaden their intellectual resources. People assimilate more cultures resources, and society for participation in cultural practice and community significant role in increasing personal knowledge. From the interaction. People assimilate more cultures resources, and teaching results, but scattering among learners and their network [4].

The effect played by learning network on learners' behavior cannot be ignored. From the perspective of social network analysis, learner's behavior could be reflected with a process of transforming from "novices" to "central players" in the network [4].

learning is not an isolated, individual processes, neither just teaching results, but scattering among learners and their environment. Participation in social communities plays a significant role in increasing personal knowledge. From the perspective of participation, learning is the activities of the society for participation in cultural practice and community interaction. People assimilate more cultures resources, and therefore broaden their intellectual resources.

Understanding learner's behavior, processes and environment interact with each other, with changes of any one of which resulting in the changes of the other two. Learning is not to get personal, objective knowledge, or the formal process of skill, but to get knowledge about acting in the common activities of a group of people, language and access. In this process, individual acquire the group culture, and behave like other members of this group.

5. Conclusions

This study intends to analyze the relationship between learner's position in a learning network and their academic performance, and special attention is paid on top ICT majors. It is found that top learners tend to be at the central positions at the learning network, and tend to have higher degree centrality.

The effect played by learning network on learners' behavior cannot be ignored. From the perspective of social network analysis, learner's behavior could be reflected with a process of transforming from "novices" to "central players" in the network [4].

Figures

Table 1. Correlation between GPA and the core degrees at 4 networks.

| Core degree at the | Avg. GPA | Core degree at the working network | Core degree at the instrumental network | Core degree at the social capital network | Core degree at the emotional network |
|-------------------|----------|-----------------------------------|----------------------------------------|------------------------------------------|-------------------------------------|
| Working network   | Pearson Correlation Significance (bilateral) | 1 | .001 | .373** | .366* | -.173 |
|                   | N        | 47 | .994 | .10 | .037 | .245 |
| Instrumental network | Pearson Correlation Significance (bilateral) | 001 | 1 | .570** | .572** | .581** |
|                   | N        | 47 | .994 | .000 | .000 | .000 |
| Social capital network | Pearson Correlation Significance (bilateral) | 373** | .570** | 1 | .915** | .477** |
|                   | N        | 47 | .10 | .000 | .000 | .000 |
| Emotional network  | Pearson Correlation Significance (bilateral) | .581** | .477** | .580** | 1 |
|                   | N        | 47 | .245 | .000 | .001 | .000 |

| MEASURES | VALUE |
|---------|-------|
| SUM     | 237   |
| MEAN    | 4.938 |
| STD.DEV.| 4.507 |
| MIN.    | 0     |
| MAX.    | 17    |

Figure 2. General description of the degree centrality: instrumental network.

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