

A Study of the Self-Organizing Capacity on Computer Use in Rural Areas

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Abstract: In modern society, even if rural people are no longer strangers to computer, the problems concerning the service efficiency of Computer in rural areas and the Computer use education for peasants also arise accordingly. By combining macro-level sampling questionnaire survey and micro-level observational interview with regular evaluation, this study places the interviewees from rural areas in the organizational system of Computer use education, to investigate the recognition and service condition of rural network Computer and sum up the various problems existing in the development of Computer in rural areas. According to the data obtained from continuous assessments, it makes analysis on the awareness and usage degree of media in different locations and at different times. This study shows that the Computer use education in rural areas presents a self-construal form with interpersonal communication oriented. For this, we should introduce a multiple organization structure, thereby to promote peasants' right of discourse in network Computer, so as to really promote peasants' initiative and actual ability in participation in social development.

Keywords: Computer use, interpersonal communication, opinion leader and computer use.

1. INTRODUCTION

The study on the issues of Computer use in Mainland China began with 1990s. After 2007, with the change of Chinese media circumstance, the study on Computer use has gradually become intensive, and more and more studies have been made on Computer use education, especially the survey on the Computer use of the college students across the country, which has markedly increased in number [1]. According to the comparative study which takes such countries as UK and USA as the reference object, the challenges with which China's Computer use education is faced are mainly from the indigenous difficulties and pressures as well as the malposition of educational practice formed by the deep-seated contradictions between oriental and occidental cultures [2]. Compared to the western study of Computer use, China's study of Computer use general discussion presents the characteristics that general discussions are more than demonstrations and specific groups are designated as core research orientation. In 2008, scholar Ji Deqiang made a quantitative study according to the research literatures on China National Knowledge Infrastructure (CNKI), to get a research pedigree chart about Computer use in China. Although Computer use education also serves as a topic selection direction of the study, the feature of typed group is still very obvious. Such as college students and youngsters, etc. Starting with specific groups' Computer use performance, it looks back upon the problems of Computer use education [3]. Standard thought takes Computer use education as the basis, to determine the problems of Computer use education by making analysis on Computer and finding reasons for it [4]. At the side of the

flourishing status quo of the studies on adolescents' Computer use education, the study on new rural construction and Computer use promotion accounts for only a tiny share, as part of the study on disadvantaged areas and groups. In the meanwhile, the study on new Computer use in rural areas has become a blank area.

Further statistics shows that in the existing research frameworks, when the relationship between peasants and traditional media is discussed, peasants are placed in a passive position in most cases, such as "media help peasants"[5], "media against peasants"[6] and "suburbanization"[7]. The presupposition of these studies is that in most cases, peasants are educated at low levels, so that their Computer use is very low, thus being in a disadvantaged and passive position [8]. This train of thought directed by standard research tends to neglect the subjective initiative of individual peasants, especially in the context of peasants' limited access to mass media, so its tenable practice guidance will be weakened greatly. In the meanwhile, the standard research thought of Computer use education is still able to provide something useful for traditional media, but tantamount to a Barmecidal feast for the Computer system whose system margin is open [9].

Just based on the lack of new Computer use education in rural areas and the limitation of research perspectives, this paper puts forward the following research questions in allusion to the channel and way problem of the new Computer use education in rural areas, hoping to obtain the status quo and related conditions of new Computer use in rural areas.

Q1: How is the new Computer use in rural areas?

Q2: How is the Computer use education condition in rural areas? Who is the main body of new Computer use education?

Q3: Is there any difference between the Computer use levels in different rural areas? Is there certain correlation between the difference and local economic development?

Q4: What's the generative process of the new Computer use in rural areas? In what organizational process does it begin and end?

2. RESEARCH THOUGHT AND RESEARCH METHOD

2.1. The Selection of Survey Sample Region

Shandong is a rather developed province in the whole country. In recent years, Shandong province has steadily been in the top three in GDP ranking. However, like Chinese present economic development environment, there are also developmental disparities from place to place in Shandong. The economic development level of eastern Shandong is well above the west area. In 2013, according to the municipal GDP rankings in Shandong, Qingdao and Yantai ranked the top two with 73.0211 billion yuan and 52.8138 billion yuan while Zaozhuang and Rizhao ranked the fifteenth place and fifteenth place (the last but two and the last but one) with 17.4908 billion yuan and 13.5257 billion yuan. Qingdao's GDP is 5 times more than Rizhao's and Yantai's GDP is also 4 times more than Rizhao's. Thus it can be seen that there is serious imbalance phenomenon in Shandong's economic development.

We choose the above sampling points based on the following reasons: Firstly, Shandong province is located in Eastern China, its economy being relatively developed, the popularizing rate of Computer in rural areas being relatively high, so the correlations of study has certain foresightedness relative to other provinces and cities. Secondly, there are obvious economic gaps between eastern and western Shandong, similar to the gap between eastern and western China, for which reason the sample region has the typical characteristics of research object.

2.2. Research Method

With the adoption of sampling survey, this study sorts the data obtained and then assesses the data. On this basis, such research methods as the online ethnography under individual observation and the establishment of the evaluation system on Computer use are adopted.

Sample survey was completed in August, 2013. The method of stratified random sample is adopted for the survey. According to sampling requirements, we regard Laizhou city of Yantai, Rongcheng city of Weihai, Taierzhuang district and Tengzhou city of Zaozhuang, and Juxian county of Rizhao as large sampling points, from which we choose 42 villages at random according to the proportion of the population. And then, we choose 20 sample families from each village. Afterwards, we choose a respondent from each family above the age of 18 according to "last birthday". The 5 trained major interviewers and 10 assistants issue survey questionnaire to the 440 samples in the end.

Besides macro-level questionnaire survey, we also organize micro-level individual interview and online ethnographic observation. Individual interview is completed by the members of the research group together, with 2 doctors

and 1 associate professors included. Online ethnographic observation is completed by 4 graduates who attended the interview on the peasants in the villages around urban Yantai in 2010. In 2010, the research group gave an in-depth interview on 63 villagers on the outskirts of Yantai. In this research, we still take this 63 people as in-depth interviewees. Owing to the objective factors such as migration and death, we obtained 47 effective samples. According to whether they used Computer or not, we divided them into two groups, to make a comparative study.

According to the reliability requirements of Computer use assessment, the research group chose two coding clerks to make an independent assessment, with the reliability reaching 0.9, which proves the reliability of coding results.

When counting concrete data, we planned to use such methods as data assignment statistics, to make statistics and measurement of the correlation between interpersonal communication, Computer use and economic development level, to obtain intuitive data through content analysis.

3. RESEARCH ANALYSIS AND CONCLUSION

3.1. The Extent of Exposure to Computer

3.1.1. Statistics of Contacts

Among the interviewees, the statistical results about the main route of acquiring information show that internet accounts for 27.67%, TV accounts for 35.73%, journal accounts for 3.70%, smartphone accounts for 29.63% and broadcast accounts for 3.27%. It can be seen from the statistical results that firstly, in all the information sources, the attention obtained from TV ranks the first place, obviously better than other information media. Secondly, the three traditional media such as newspaper, TV and broadcast supply 42.7% of the overall information while internet and mobile phone supply 57.3% of the total information. This shows that the dominant position of traditional media has been shaken. Computer are rapidly carving up the main channels of information distribution with a strong momentum.

We find from the age statistics of the respondents that the audiences of different media differ from each other very obviously in age. Among the people who contact and use internet to obtain information, those who are aged from 16 to 45 account for 84.9%. Among the people who obtain information through smartphone, those who are aged from 18 to 35 have become dominant, accounting for 79.9%.

In the investigation and statistics of the service condition of Computer, we count the degree of the interviewees' exposure to Computer according to time length. In line with survey design, we set up a few time periods in a day, such as in half an hour, from half an hour to 2 hours, from 2 hours to 4 hours, from 4 hours to 6 hours, from 6 hours to 8 hours and over 8 hours. On this basis, we carry out statistics of the interviewees who use such digital media as internet and cell phone, etc.

According to statistics, all the interviews, on average, use Computer for 3.1 hours per day. In the specific hierarchical statistics, we call those who have a low loyalty and adhesiveness to digital media within 0.5 hour per day "scattered group"; we call those who contact digital media for 0.5 to 4

Table 1. Statistics of the exposure level to computer.

Length Media	<0.5h	0.5h~2h	2h~4h	4h~6h	6h~8h	>8h
Internet	64.1%	17.8%	9.4%	0.7%	0	0
Cell phone	61.8%	29.4%	8.8%	0	0	0

Table 2. Analysis on index factors of computer use competence.

First-Grade Index	Second-Grade Index		Assignments	Remarks
cognitive power	11	Discriminate news from advertising	5%	15%
	12	Understand the basic function of new media	5%	
	13	The ability in using new media	5%	
Interpretability	21	Seek for the hidden meaning of news reports	10%	20%
	22	Know the focus of attention of media recently	10%	
critical ability	31	Able to find the apparent errors in news reports	5%	25%
	32	Distinguish the contradictory information	10%	
	33	Whether or not recognize the viewpoints supplied by news reports	10%	
creative power	41	Often use the information offered by media to serve study, life and work	5%	25%
	42	Press release writing	10%	
	43	Use blog space, personal website and microblog together	10%	
Technical competence	51	Understand the new media technology	5%	115%
	52	Use the new media	10%	

hours per day “adherents”; we call those who contact digital media for 4 to 8 hours per day “dependents; we call those who contact digital media for more than 8 hours “addicts”.

According to the statistical results in Table 1, the distribution of those who contact digital media for not more than half an hour a day, that is, “scattered group”, is relatively high, all beyond 60%; “adherents”, who use digital media for 0.5 to 4 hours a day, also have certain advantages, 17.8% of whom use the internet, and around half of whom contact Computer for 0.5 to 4 hours. Apart from “adherents”, “addicts” make little use of internet. Only 0.7% of them use internet, while none of them uses cell phone. In addition, all the statistical results of the “addicts” who contact computer for over 8 hours are zero. As can be seen, compared to urban population, Computer contact in rural areas is still at the starting stage. The reason why such a statistical result is caused is because of its important relationship with the insufficiency of rural Computer use education.

3.2. Evaluation Analysis of Computer use Competence

In the studies on the correlation between interviewees’ personal computer use competence and network activities,

we make a statistical analysis on the correlation between the two with the interviewees’ degree of education and whether they have received formal computer use education as the independent variable and with the degree of the interviewees’ participation in network activities and exercising the right of discourse in network as the dependent variable.

Firstly, let’s determine the assessment of computer use competence. According to the analysis of Rubin, an American scholar, there are mainly three levels, which are competency model, knowledge schema and understanding model. As far as competency model is concerned, it refers to citizens’ ability in obtaining, analyzing, evaluating and transmitting various types of information, focusing on the cognitive process of information. Based on Rubin’s computer use competence model, we plan to make related statistics and assessment of this. Based on the consideration of realistic elements, we conduct a survey and assign it from such four aspects as cognitive power, interpretability, critical ability, creative power and technical competence, as shown in the Table 2.

This paper defines the five sub-systems as interpretability dimension, cognitive dimension, technical competence di-

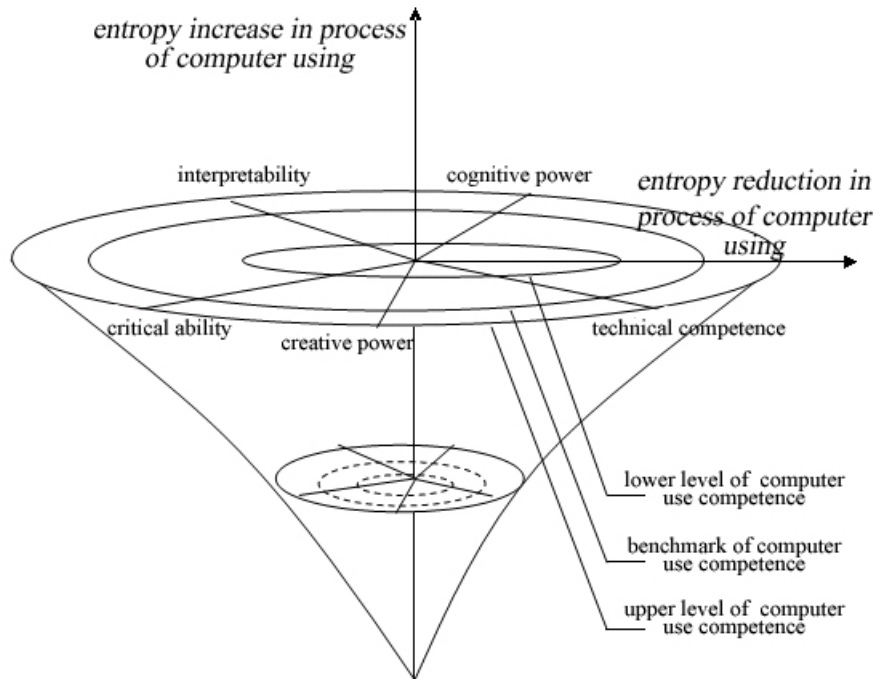


Fig. (1). Peg-top model of computer use competence.

Table 3. Statistics of the five elements of the computer use competence in the surveyed areas.

	Incongruent	Not Quite Incongruent	Just so-so	Relatively Congruent	Congruent Very Much	Mean Values
Strong cognitive power	10.25	16.54	43.10	24.12	5.99	2.76
Strong interpretability	21.42	31.71	30.76	12.90	3.21	2.34
Strong critical ability	10.62	29.94	41.71	14.77	2.96	1.87
Strong creativity	12.10	35.47	43.91	6.42	2.10	1.46
Strong Technical competence	16.93	20.12	37.45	19.87	5.63	2.36

Remarks: In the table, all figures are percentages except the row of mean value; the mean values are assigned 5 to 1 score from “Congruent very much” to “Incongruent”. The closer the value gets to 5, the stronger the corresponding ability is.

mension, creative power dimension and critical ability dimension in order to set up the model of “Peg-top Model of Computer Use Competence”. These five dimensions affect the entropy value of information communication. The external shape of the model is like a streamline cone and the children toy “peg-top”, so it is named as peg-top model in this paper, which is shown in Fig. (1).

According to the survey, 56.6% of the interviewees say that it’s easy or comparatively easy for them to “discriminate news from advertising” while 24.4% of them give a negative answer. 11.4% of the respondents “know the focus of attention of media recently” while the rest 65.7% express they do “not know clearly”. 47.8% of them usually “seek for the hidden meaning of news reports” when reading news. As for “able to find the apparent errors in news reports”, 23.9% of the interviewees say they do “not have a strong ability”, while 7.6% express they are “able to” or “very able to” and 68.5% express they don’t pay attention. As for “the viewpoints supplied by news reports”, 83.8% people usually tend

to “not reject” while only 4.5% “firmly reject”. “When encountering ambivalent news information”, 91.8% of the people are inclined not to verify while only 2.9% say they often verify. More than half of the interviewees can “often use the information offered by media to serve study, life and work”. However, only few people “get to write news release” or “have their own blog space or person website”.

In summary, at present, rural computer use competence is under middle level. This can be reflected in Table 3. Especially are “critical ability” and “creative power”, which fail to reach the mid-value in the five-grade scale. In the five indicators, the mean value of “cognitive power” is the highest one (2.76), which shows that for the operating method and process of new media, the interviewees have got a clear knowledge of the peculiarity, function and law of different media. In addition, “interpretability” ranks the second place, which shows that the interviewees’ interpretability of media is in the development course, so that they have the ability to interpret such contents as the meaning behind news.

Table 4. Statistics of the source of computer usage.

Instructor	Relatives and Friends	Self-Study	School	Specialized Training Institutions	TV and Journal, etc.
Proportion	35.64%	29.71%	10.89%	2.64%	21.12%

The above analysis can primarily validate that the overall level of computer using in rural areas is not high, so educational level and channel urgently need to be improved. Besides, the five elements of media literacy (cognitive power, interpretability, critical ability, creativity and Technical competence) have an explaining power on reality. They are enough to accurately describe the actual computer using level of the respondents.

3.4. The Educational Channel of Computer Usage

Since countryside is a “village-type” compact community, where there is no high building or large mansion obstructing, the villagers are closely related to one another. In their spare time, people like getting together to chat, while various media are delivered in such an atmosphere. As for the factors which affect villagers’ awareness of Computer, we reach a conclusion after investigation that their relatives and friends have the greatest impact on them. 35.64% of the interviewees come to contact various media under the influence of their relatives and friends. Secondly, Since countryside is a “village-type” compact community, where there is no high building or large mansion obstructing, the villagers are closely related to one another. In their spare time, people like getting together to chat, while various media are delivered in such an atmosphere. As for the factors which affect villagers’ awareness of Computer, we reach a conclusion after investigation that their relatives and friends have the greatest impact on them. 35.64% of the interviewees come to contact various media under the influence of their relatives and friends. Secondly, 29.71% of the interviewees express that it’s a self-study process for them to get to know Computer. Most of these people are adolescents or young people, who have strong desire to discover something new and strong ability in accepting new things. Still other students express that they get to know Computer under the influence and education of their teachers and classmates in school and then master certain methods and skills. This group of people accounts for 10.89% of the total number of the interviewees. There is a large part of interviewees expressing that they come to know other unknown media under the influence of such known media as TV and journal. Only a few interviewees (2.64%) say that they get knowledge of media under the influence of specialized training institutions, which also shows the importance of interpersonal communication in the educational activities of new Computer use. The statistics of the source of Computer use are shown in Table 4.

In the process of self-organized education, the function of interpersonal communication is essential. Compared with urban diversified information spreading and receiving channel, rural interpersonal communication occupies the mainstream information dissemination channel. It is the direct operation mode of Computer use education. According to some scholars’ studies, even though different interpersonal

communicative forms have played entirely different roles in obtaining media knowledge, on the whole, there are significant positive relationships between interpersonal communication and media participation efficacy and media participation intention. That is to say, interpersonal communication affects media participation awareness while media participation awareness is an important part of the critical ability and creative ability in Computer use. So it can be said that the effectiveness of interpersonal communication has determined the degree of Computer use education in the field of media dissemination. In particular, what is noteworthy is that the more active a talker in interpersonal communication is, the more obvious his media participation awareness will be. Both speculative people who are interactive and rational and conversable people who have a disposition to make friends, have a large circle of good friends and have a high tolerance level are excellent in positively predicting media participation efficacy and media participation awareness [10]. Research findings show that interpersonal chat and communication seem to serve as a certain catalyst for media participation. As the prior variable of media participation, it heralds the strength and direction of media participation awareness, and the herald is too strong to be affected by individual media knowledge.

How do opinion leaders play a part in Computer use education? In order to know more about the direct role of interpersonal communication in Computer use education, we have introduced more microcosmic method of investigation in the process of investigation: In virtue of a certain interviewee’s individual interpersonal communication, we get to understand the process of the self-organized education of his new Computer use. For this, we have designed a self-organized correlation graph of interpersonal communication, thereby to show the relationship between the interpersonal relationship and Computer use education at various related nodes.

In the process of investigating the Computer use education self-organization formed by the interpersonal communication relation in Fig. (2), we can see that among the 22 people involved in the table, in the network relation, where Wang Xinping and Wang Liping are the main communication nodes, various ties of consanguinity are mainly involved. In the process chain of educational communication on others, apart from two classmates, a colleague and a workmate, other relations are all within the scope of lineal relative by blood. This shows that at present in rural areas, Computer use education and spreading mainly takes blood lineage as bond. It expands outwards through blood lineage, thus forming more complex organization relations. In addition, Wang Xinping and Wang Liping, in the core position of self-organized process, are the opinion leaders of Computer use education. Our further investigation shows that both of them are rural intellectuals with certain knowledge. Wang

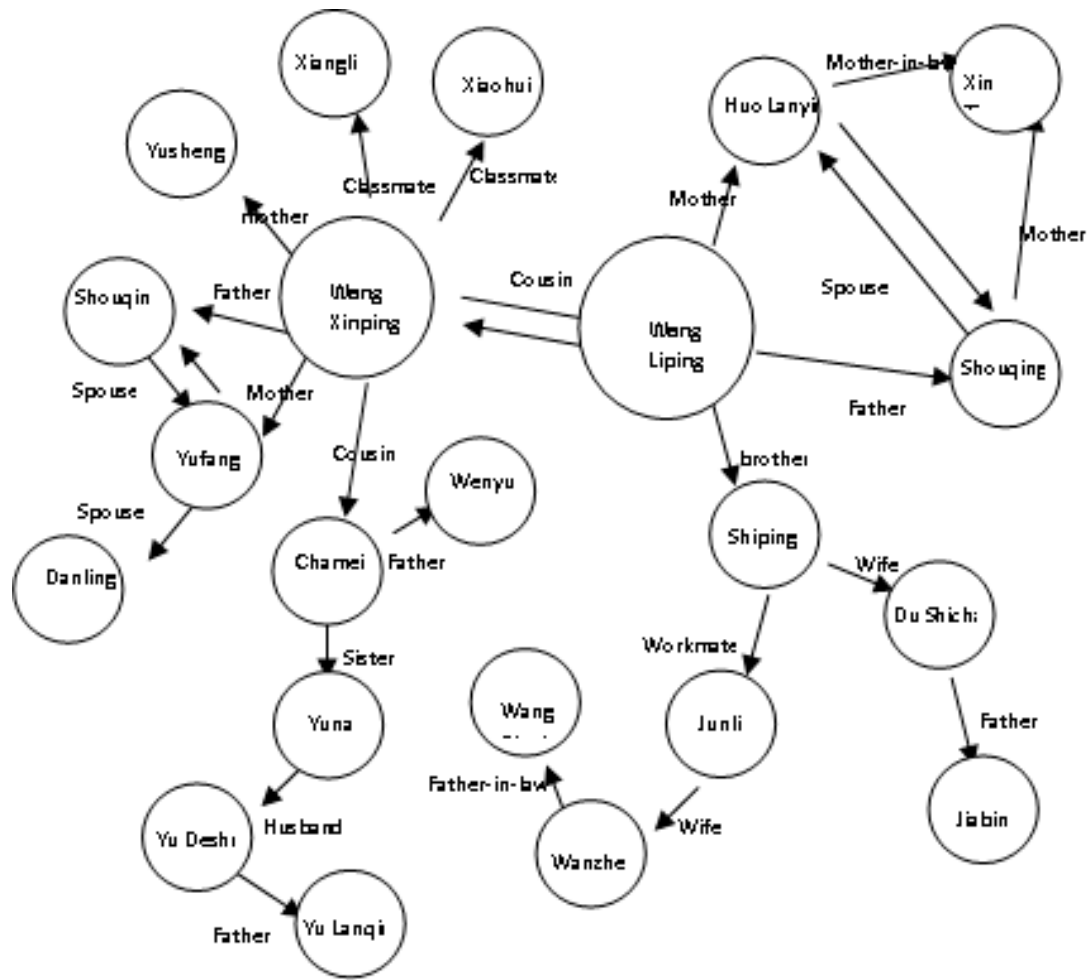


Fig. (2). Self-organized correlation graph of new computer use education in rural areas.

Xiping is a college student and Wang Liping is a rural primary school teacher. Since rural primary and secondary schools have yet to offer the course of Computer use education, Wang Liping, though a primary school teacher, can only pass the relevant knowledge down to the most direct blood relatives in interpersonal communication.

4. CONCLUSION

(1) Rural areas have witnessed rapid development of Computer, which, at present, has become an important channel for rural audiences to receive information. Especially are mobile media, represented by mobile phone, whose emergence has speeded up the spread channel and transmission platform of Computer. In the meantime, although traditional media still occupy an important place, their development has stagnated and even retrograded compared with Computer.

(2) The overall new Computer use of the Computer audiences in rural areas is not high. Therein, network self-empowerment and speaking right are relatively low. Under normal circumstances, peasants focus only on Computer as entertainment and chat tools. Cyber media function is affected and restricted, so that the shape and construction of the right of discourse in network is affected further.

(3) The Computer use education activities in rural areas are in a messy spontaneous state. The interviewees think that

rural areas should increase input and strength in new Computer use education, to narrow the gap between urban and rural areas. In the channel of Computer use education, at present, although rural primary and secondary schools have offered such courses as computer application, etc., have yet to offer the course which can highlight Computer use. Especially in recent years, as Computer technology is upgraded constantly, the issue of Computer use education becomes more urgent.

(4) Rural new Computer use level is greatly affected by regions and time domains. High is the Computer use in the villages on the outskirts of the cities in eastern coastal Shandong and low is the Computer use economic less-developed rural areas. The difference is not only showed in the relative lag of the platform construction of Computer hardware, so that information consumption always serves as a choice goal after living and productive consumption, but also reflected in such aspects as the shortage and low level of the organization of Computer use education and the spontaneous emergence of “opinion leaders”, etc., thereby to highlight that the new Computer use in economically undeveloped areas is relatively low. Except for the impact of regional economic level, new Computer use also presents certain change laws in the time domain. The formation process of new Computer use is similar to the process of innovation diffusion, showing normal distribution.

(5) New Computer use in rural areas is completed through interpersonal communication and self-construction. Through the channel of interpersonal communication and self-construction, the audiences accomplish the accumulation of Computer knowledge and the promotion of Computer use. In interpersonal communication relation, the “opinion leaders” of new Computer use education, who are active in urban and rural areas, play a central role, thus forming secondary interpersonal communication networks. In the educational activities of new Computer use, “opinion leaders” and educates at all levels act as self-organization main bodies of educational activities. They not only complete interpersonal education through interpersonal communication, but also accomplish the self-construal process of Computer use through such tools as interpersonal communication on online communities and the specific search engine for Computer. It is observed that the new Computer use in rural areas is a self-organizing process. In the face of information fragmentation and out-of-order development direction, synergistic dissemination is substantially necessary. Herman Hawking, founder of synergy theory, thinks that the coherence and interaction of subsystems generate greater whole function for system than the simple sum of figures of element function [10]. In the process of complex systemic evolution, all subsystems will gravitate towards new balance in a self-organizing manner through mutual synergistic effect and under the impetus of their own fluctuating force. In the educational activities of new Computer use, the people in the educational activities, who act as different roles, exist in a state of disorder. Under the action of system self-organization, advantageous information starts to recommend the “opinion leaders”, who have certain Computer use, for the core position of each subsystem in cluster manner, to attract the relevant rural audiences towards a direction, thus forming an ordered structure. This is the process of the synergistic education of new Computer use. In such a process, rural economic development level, regional overall education level, the mobility situation of local population and the num-

ber of the “opinion leaders” in a given area as well the level of Computer use help to bring about important order parameters in the process of synergistic education in rural areas.

CONFLICT OF INTEREST

The authors confirm that this article content has no conflict of interest.

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