A Research on College Students’ Motivation of Promoting the Information Literacy Based on ARCS Model

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With the progress of network technology and the deepening of college education informatization, college students will have more comprehensive and frequent contact with the network. According to the ARCS motivation model, the current situation of college students’ motivation of promoting the information literacy was investigated, the factors affecting college students’ motivation were analyzed, and the strategies of promoting college students’ motivation of optimizing the information literacy based on ARCS Model were proposed. The purpose of this study is to enable college students to make full use of the network, improve their information literacy, and optimize the effect and benefit for study.

Keywords: information literacy, ARCS Model, learning motivation

Introduction

As the main force on the Internet, most of the college students consider that surfing online is an accepted norm of daily life. Nowadays, the learning resources based on the Internet are increasingly rich. However, while the Internet brings people convenience, it also has some negative effects. Many problems arise when college students study on the Internet. Therefore, it is necessary to investigate and analyze the current situation of college students’ information literacy.

The ARCS motivation model is a kind of model to stimulate and sustain learning motivation which is proposed from four factors: attention, relevance, confidence, and satisfaction. An operational mode for effectively activating students’ learning motivation is provided. Based on the domestic and foreign literature, this research takes the questionnaire status analysis as the method, scientifically investigates the status quo of college students’ motivation of promoting information literacy.

Literature Review

In the process of collecting and collating domestic and foreign literatures, there are many researches on the ARCS model and information literacy, but few researches focus on both of them. The author used the ARCS model and information literacy as key words to collect and organize relevant literature references.

There are many researches on the ARCS theory at home and abroad, and the superiority of the model is fully demonstrated through various theoretical researches and experiments. In 1979, the design concept of ARCS motivational system was put forward by John M. Keller. Since then, in the process of continuous efforts, a relatively perfect model is designed. According to this model, there are four types of factors affecting students’
A RESEARCH ON COLLEGE STUDENTS’ MOTIVATION

learning motivation: attention, relevance, confidence, and satisfaction (see Table 1). Keller (1987) put forward that the ARCS Model of motivation was developed in response to a desire to find more effective ways of understanding the major influences on the motivation to learn, and for systematic ways of identifying and solving problems with learning motivation. At home, the research on the ARCS Model of motivation has gradually entered a stable state in recent years, and the interest has not subsided. Li, Xu, and Zheng (2013) have concluded that the ARCS model of motivation not only made account of the stimulation, but also attached more importance to the maintenance of motivation, which has great guiding significance for the design of network learning feedback. Liao (2016) found that compared with the general teaching method, this method is an effective teaching strategy to stimulate and maintain motivation.

Table 1
Motivational Categories of the ARCS Model

<table>
<thead>
<tr>
<th>Categories</th>
<th>Subcategories</th>
<th>Process questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attention</td>
<td>A.1. Perceptual Arousal</td>
<td>What can I do to capture their interest?</td>
</tr>
<tr>
<td></td>
<td>A.2. Inquiry Arousal</td>
<td>How can I stimulate an attitude of inquiry?</td>
</tr>
<tr>
<td></td>
<td>A.3. Variability</td>
<td>How can I maintain their attention?</td>
</tr>
<tr>
<td></td>
<td>R.1. Goal Orientation</td>
<td>How can I best meet my learner’s needs? (Do I know their needs?)</td>
</tr>
<tr>
<td>Relevance</td>
<td>R.2. Motive Matching</td>
<td>How and when can I provide my learners with appropriate choices, responsibilities, and influences?</td>
</tr>
<tr>
<td></td>
<td>R.3. Familiarity</td>
<td>How can I tie the instruction to the learner’s experiences?</td>
</tr>
<tr>
<td>Confidence</td>
<td>C.1. Learning Requirements</td>
<td>How can I assist in building a positive expectation for success?</td>
</tr>
<tr>
<td></td>
<td>C.2. Success Opportunities</td>
<td>How will the learning experience support or enhance the students' beliefs in their competence?</td>
</tr>
<tr>
<td></td>
<td>C.3. Personal Control</td>
<td>How will the learners clearly know their success is based on their efforts and abilities?</td>
</tr>
<tr>
<td></td>
<td>S.1. Natural Consequences</td>
<td>How can I provide meaningful opportunities for learners to use their newly acquired knowledge/skill?</td>
</tr>
<tr>
<td>Satisfaction</td>
<td>S.2. Positive Consequences</td>
<td>What will provide reinforcement to the learner’s successes?</td>
</tr>
<tr>
<td></td>
<td>S.3. Equity</td>
<td>How can I assist the students in anchoring a positive feeling about their accomplishments?</td>
</tr>
</tbody>
</table>

In view of the information literacy, some scholars at home and abroad have conducted investigation and analysis. The concept of information literacy was first proposed in 1974 by Paul Zurkowski, President of the Information Industry Association of America. Information literacy was defined as an ability to extract, accept and create good value from needed information. The Association of College and Research Libraries approved *Information Literacy Competency Standards for Higher Education* in 2000. Information literacy was defined as a set of abilities requiring individuals to “recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information” (Iannuzzi, 2000). With the inspirations of foreign studies, domestic scholars also attempt to define and explain information literacy. Na, Wu, and Lv (2010) summarized that the essence of the connotation is basically unified, that is, information awareness, information knowledge, information ability, and information morality although there are various expressions about the connotation in China. Zhang (2006) pointed in the thesis that information literacy was an important index to evaluate the comprehensive quality of talents, a basic and comprehensive ability in the process of global informatization.

To sum up, both the ARCS model of motivation and the information literacy are studied by researchers. These theories tend to be stable and complete. However, most of the research focuses on the education and
teaching of teachers and libraries, besides, there are few studies about information literacy based on ARCS Model.

**The Current Situation of College Students’ Information Literacy**

The questionnaire of the evaluation criteria proposed by Huang and Peng (2019) who summarizes the existing information literacy evaluation criteria at home and abroad is used in the research. There are 25 questions in the questionnaire, which correspond to four dimensions and 12 secondary indexes of information literacy evaluation index of college students. In the following part, the data are analyzed and screened.

**The Current Situation of Students’ Information Awareness**

The investigation of college students’ information awareness is divided into six questions (see Table 2).

<table>
<thead>
<tr>
<th>Question</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Uncertain</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I think information is very important for life, study and work.</td>
<td>70.3%</td>
<td>25.74%</td>
<td>2.97%</td>
<td>0.99%</td>
<td>0%</td>
</tr>
<tr>
<td>I am willing to pay for information services.</td>
<td>29.7%</td>
<td>47.52%</td>
<td>21.78%</td>
<td>0.99%</td>
<td>0%</td>
</tr>
<tr>
<td>I pay attention to protecting the information of personal privacy, and have the ability to maintain the security of personal information.</td>
<td>38.61%</td>
<td>41.58%</td>
<td>15.84%</td>
<td>2.97%</td>
<td>0.99%</td>
</tr>
<tr>
<td>I have the habit of backing up important information.</td>
<td>27.72%</td>
<td>38.61%</td>
<td>26.73%</td>
<td>6.93%</td>
<td>0%</td>
</tr>
<tr>
<td>I have the awareness of information protection, understand the risks of information, and can actively avoid them</td>
<td>24.75%</td>
<td>53.47%</td>
<td>21.78%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>I have a certain understanding of hot issues such as big data and artificial intelligence in the era of information, I intend to or have acquired relevant knowledge and skills, and I am willing to share some of the information I search with others.</td>
<td>18.81%</td>
<td>39.6%</td>
<td>24.75%</td>
<td>16.83%</td>
<td>0%</td>
</tr>
</tbody>
</table>

The college students surveyed think information is very important to their life, study, and work, with 96.04% agreeing, 77.22% of college students support paid services of information. Information security is very important in network environment. The data show that most college students have a high awareness of information security, but the awareness still have a way to go. The survey finds that 58.41% of college students have a certain understanding of hot topics such as big data and artificial intelligence, intend to or have learned relevant knowledge and skills, and are willing to share some of the information they find with others.

In summary, most students have a strong sense of information. However, there are still some shortcomings. First of all, the awareness of information security has yet to be improved. Besides, they have some knowledge of hot spots, but their awareness of how to deal with them needs to be improved.

**The Current Situation of Information Knowledge**

The questionnaire sets up three questions to investigate college students’ information knowledge (see Table 3).

In these questions, very few students chose to disagree and strongly disagree. Table 3 shows that college students generally master related content of information knowledge.

In terms of information knowledge, most college students have some understanding of basic theoretical knowledge related to information, but their understanding is not comprehensive. Generally, college students are proficient in basic office software, but few take the initiative to learn to use other professional software.
Table 3
The Investigation of College Students’ Information Knowledge

<table>
<thead>
<tr>
<th>Questions</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Uncertain</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I understand the basics of information, such as the nature, characteristics, types, and so on.</td>
<td>14.58%</td>
<td>44.55%</td>
<td>33.66%</td>
<td>4.95%</td>
<td>1.98%</td>
</tr>
<tr>
<td>I am skilled in computer application software, such as office software and professional data analysis software commonly used.</td>
<td>19.8%</td>
<td>47.52%</td>
<td>28.71%</td>
<td>3.96%</td>
<td>0%</td>
</tr>
<tr>
<td>I am skilled in downloading and using Apps on mobile phones.</td>
<td>63.37%</td>
<td>33.66%</td>
<td>2.97%</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

The Current Situation of Information Ability

Information ability is composed of ability to express information requirements, ability to organize information, ability to obtain information, ability to analyze information, ability to apply and create information, ability to evaluate information and professional information ability. According to these seven aspects, the questionnaire sets 13 questions to investigate the information ability (see Table 4).

Table 4
The Investigation of College Students’ Information Requirements

<table>
<thead>
<tr>
<th>Question</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Uncertain</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I can express my needs and problems of information accurately in my life.</td>
<td>30.69%</td>
<td>53.47%</td>
<td>15.84%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>I can categorize, reorganize, transform, and output information based on a topic.</td>
<td>17.82%</td>
<td>50.5%</td>
<td>28.71%</td>
<td>2.97%</td>
<td>0%</td>
</tr>
<tr>
<td>I can skillfully use search engines for information retrieval and data collection.</td>
<td>31.68%</td>
<td>48.51%</td>
<td>17.82%</td>
<td>1.98%</td>
<td>0%</td>
</tr>
<tr>
<td>I can get digital learning materials through online communities, school libraries, and other channels.</td>
<td>38.61%</td>
<td>45.54%</td>
<td>12.87%</td>
<td>1.98%</td>
<td>0%</td>
</tr>
<tr>
<td>I can independently select the information I need from the mass of information, analyze the main content, source, publisher, and so on from the information obtained, and evaluate the authenticity, authority, and effectiveness of the information.</td>
<td>24.75%</td>
<td>47.52%</td>
<td>23.76%</td>
<td>2.97%</td>
<td>0.99%</td>
</tr>
<tr>
<td>I am able to integrate fragmented information from the Internet, such as information related to the same topic.</td>
<td>17.82%</td>
<td>60.4%</td>
<td>19.8%</td>
<td>1.98%</td>
<td>0%</td>
</tr>
<tr>
<td>I am able to apply the information obtained to the writing of course papers, graduation projects, etc.</td>
<td>30.69%</td>
<td>58.42%</td>
<td>9.9%</td>
<td>0.99%</td>
<td>0%</td>
</tr>
<tr>
<td>I can use existing information to come up with new ideas and assumptions.</td>
<td>17.82%</td>
<td>38.61%</td>
<td>27.72%</td>
<td>15.84%</td>
<td>0%</td>
</tr>
<tr>
<td>I am familiar with databases related to my major, and can skillfully use to search for information.</td>
<td>12.87%</td>
<td>46.53%</td>
<td>32.67%</td>
<td>6.93%</td>
<td>0.99%</td>
</tr>
<tr>
<td>I understand the core journals, magazines and other authoritative information sources related to my major.</td>
<td>12.87%</td>
<td>42.57%</td>
<td>29.7%</td>
<td>14.85%</td>
<td>0%</td>
</tr>
<tr>
<td>I have participated in research projects and can use the information obtained to write papers or reports.</td>
<td>13.86%</td>
<td>26.73%</td>
<td>26.73%</td>
<td>25.74%</td>
<td>6.93%</td>
</tr>
<tr>
<td>I can use data processing software such as Excel and SPSS to process and analyze the original data.</td>
<td>9.9%</td>
<td>39.6%</td>
<td>34.56%</td>
<td>16%</td>
<td>0%</td>
</tr>
<tr>
<td>I pay close attention to the cutting-edge information of professional development through RSS, academic exchange websites, and other channels.</td>
<td>9.9%</td>
<td>25.74%</td>
<td>29.7%</td>
<td>24.75%</td>
<td>9.9%</td>
</tr>
</tbody>
</table>

As can be seen in Table 4, on the whole, most students chose “agree” and “uncertain”. Nevertheless, 15.84% of college students seldom come up with new ideas and assumptions with existing information, 31.68% of college students didn’t think they could classify, reorganize, transform, and output information effectively, 19.8%
of students aren’t familiar with databases related to their major, or can’t skillfully search for information, 14.85% of students seldom read core journals, magazines, or other authoritative information sources related to their major, 32.67% of students haven’t participated in research projects, 16% of students can’t use data processing software such as Excel and SPSS to process and analyze the original data, 34.65% of students don’t pay close attention to the cutting-edge information of professional development through RSS, academic exchange websites, and other channels.

The result shows that there is still a long way to go. In terms of the ability to express information requirements, college students have higher ability to express their needs and problems of information accurately. However, the information innovation ability of college students needs to be improved. Professional information literacy is also an important aspect of college students’ information literacy, the survey found college students paid less attention to more professional information and cutting-edge information of professional development.

The Current Situation of Information Morality

The questionnaire examines the information morality of college students with three questions (see Table 5).

Table 5
The Investigation of College Students’ Information Morality

<table>
<thead>
<tr>
<th>Question</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Uncertain</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I understand the ethics and laws related to computers and the Internet.</td>
<td>18.81%</td>
<td>53.47%</td>
<td>24.75%</td>
<td>1.98%</td>
<td>0.99%</td>
</tr>
<tr>
<td>When I need to quote others’ opinions or data in my course work or thesis writing, I will make standard notes and respect others’ intellectual property</td>
<td>45.54%</td>
<td>41.58%</td>
<td>10.89%</td>
<td>1.98%</td>
<td>0%</td>
</tr>
<tr>
<td>I can consciously abide by the network ethics, do not release false information.</td>
<td>61.39%</td>
<td>33.66%</td>
<td>3.96%</td>
<td>0.99%</td>
<td>0%</td>
</tr>
</tbody>
</table>

When there are some legal and moral problems in the use of information, most students can deal with them correctly. But in some cases, there are students who aren’t sure if they are dealing with it correctly. Especially about the ethics and laws of information, 24.75% of students choose “uncertain”. In study or scientific research, college students may not always know whether their behaviors of quoting or taking example by others are reasonable use or tort, reference, or plagiarism. Therefore, there are 10.89% of students that choose “uncertain”. College students have strong self-control in the face of undesirable information and can basically comply with the network ethics.

Strategies of Promoting College Students’ Motivation of Optimizing the Information Literacy Based on ARCS Model

The ARCS motivation model is to stimulate and sustain learning motivation. This part will provide strategies of promoting information literacy based on ARCS Model.

Attracting Students’ Attention to Information Literacy

There are three strategies to attract students’ attention: perceptual arousal, inquiry arousal, and variability. Perceptual arousal revolves around a question: how to capture students’ interest. In general, students’ attention can be attracted and maintained through novel, uncertain, and inconsistent events. Inquiry arousal means stimulating the desire for knowledge. The nature of curious provides the possibility to stimulate students’ desire
for knowledge, that is, they have needs. It is considerable for variability to maintain attention. The combination and replacement of various forms can mobilize students’ learning enthusiasm.

When students are interested in learning, they will have active learning intention, which is conducive to the success of learning. And the pleasure of success will further stimulate new interest in learning, so as to learn into a virtuous circle. Through their own efforts of actively exploring the unknown areas, they can find the fun of exploring and obtain unremitting motivation of the active learning.

**Strengthening Relevance Between College Students and Their Information Literacy**

Petty and Cacioppo argued in 1979 that if an issue became more relevant and important to individuals, they will have an incentive to address the issue more thoroughly. Strengthening relevance can begin with the following steps: goal orientation, motive matching, and familiarity.

Goal orientation is the most primary part of relevance. Students will learn actively if they realize that it is related to real life experience, existing knowledge, or some kind of interest. Secondly, motive matching means to provide learners with appropriate choices, responsibilities, and influences. The last part of relevance is familiarity. Improving familiarity lies in combining information literacy with students’ acquired knowledge and experience.

**Promoting Students’ Confidence in Improving Information Literacy**

Confident students take the initiative to explore the unknown world and the unknown knowledge. According to ARCS Model, confidence is divided into learning requirements, success opportunities, and personal control. First of all, learning requirements means helping students develop a positive attitude towards success. Then, success opportunities can be explained that the learning experience supports or enhances the students’ beliefs in their competence. Thirdly, personal control is to show students that success is based on effort and ability.

Keller proposed that students have the direction of efforts and try their best to achieve the objectives by clearly informing about the objectives and evaluation criteria. In the process of improving information literacy, students should set tasks with moderate difficulty and objectives to create a relaxed and pleasant learning environment and build and enhance confidence. Meanwhile, assign some challenging tasks can inspire greater motivation of information literacy. It is especially important for them to have a sense of success after overcoming difficulties. Moreover, confidence springs up when students understand that their success comes from their own efforts.

**Enhancing Students’ Satisfaction with Information Literacy**

In learning, students can get satisfaction from the value and enjoyment of information literacy. Satisfaction, as a category of ARCS Model, has three subcategories: natural consequences, positive consequences, equity.

The natural consequences mean the newly acquired knowledge or skills is considered by students. It is a useful method providing meaningful opportunities for learners to use their newly acquired knowledge or skill to solve problems in real situations.

The key of positive consequences is to provide reinforcement to students’ successes. It is necessary to be good at using the reward strategy to enhance the sense of achievement of information literacy.

How to anchor a positive feeling to students’ accomplishments is the question of equity in ARCS Model. And this aspect of satisfaction is more from the outside, such as teachers, classmates, parents, and so on. The evaluation of students should be fair and consistent.
Conclusion

This paper investigates the current situation of college students’ information literacy and proposes preliminary strategies based on the ARCS Model of motivation. Motivation provides the possibility to stimulate students’ desire for improving information literacy. ARCS Model can be used for reference to improve information literacy. However, the strategies are not practiced in this research. Later studies may have a better confirmation of it.

References