

Research on Information Anxiety of College Students under the Background of Information Overloaded Based on Support Vector Machine Optimization Alogrithm

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Abstract—With the continuous improvement of Internet technology, people have entered an era of continuous soaring knowledge and information. This era has brought infinite opportunities and challenges. People are exposed to a lot of information every day, such as the numerous information from Tic Toc and Weibo. However, the ability of receiving information of each person is limited. When the amount of received information exceeds his or her ability, information anxiety will arise. If things keep going like this, information anxiety will have a negative impact on the life and study of the college students. Meanwhile, Support Vector Machine (SVM) as one of the machine learning methods is of importance in statistical learning technology. Because of its high efficiency, good performance and wide applications in classification, forecasting, and estimation, the SVM has become the most recognized method in learning machines. Therefore, this paper applies the Support Vector Machine optimization algorithm in Matlab language to quantify the relationship between the amount of information received and degree of information anxiety, seeking to find a balance point to help students learn more efficient. Through the study of questionnaires, we find the three factors that cause college students information anxiety. We take these three as the independent variables, and the degree of information anxiety as the dependent variable. By the SVM alogrithm, the model between information anxiety, and the amount of information received is created. Then we can calculate the balance point. This paper also analyses the reaction of college students when they are exposed to a large amount of overloaded information, and the main behaviors of information anxiety. As for how to cope with the information anxiety, the redundant information is filtered through optimization algorithms model in order to provide students with effective information. College students can relief information anxiety through the three aspects of individual, school and society, so that they can actively deal with information overload and alleviate information anxiety.

Keywords- college students; information anxiety; Support Vector Machine optimization algorithm optimization algorithms; coping strategies

I. INTRODUCTION

In the contemporary international society, with the rapid development of information technology, people have entered a brand-new information age. The Internet provides a good platform for college students. Students can talk or surfing the

web by the Internet. For example, during the COVID-19 pandemic in 2020, college students can learn through the Internet and attend classes remotely, which enriches their learning methods. It can greatly help us to concentrate on studying without being disturbed by various external factors. Also, students can also freely choose to obtain information that is completely unrestricted by network time and information space. They can access a large amount of information at any time through smart devices such as mobile phones and computers. However, the amount of information that each individual can bear is limited. When the information received far exceeds the range that they can bear, the brain will be a traffic jam and they do not know what to do next. This will lead to anxiety and irritability. This state is called information anxiety. This is how people suffer from information anxiety.

According to an analysis of a survey, the death rate of young people with information anxiety stress syndrome in China has arrived at about 4%. [4]. Because in today's era, young people often have more opportunities to access information and are more susceptible from information overload. When they suffer from information anxiety, students will gradually begin to lose themselves, the motivation to advance in life, and do nothing all day long, which may even students' personality become distortion and the academic study fails. Information anxiety has seriously affected the students' physical and mental healthy, and deepen learning. Therefore, in order to eliminate this negative impact, the article elaborates on three aspects: the generation and development process of information anxiety, the different manifestations of information anxiety, and targeted coping strategies.

II. THE DEFINITION OF INFORMATION ANXIETY

"Information Anxiety" can also be called "information anxiety disorder" or "information anxiety syndrome", which is a complex modern social psychological phenomenon. As early as 1989, RS Wurman, the creator of Information Architecture (IA), pointed out that "when people don't understand information, they feel submerged in a large amount of information to understand, and they don't know whether certain information exists, they don't know where to look for information, or you know where to look for information but cannot get it, people will suffer from information anxiety"[1].

Cao (2010) further revised the interpretation of information anxiety as "a kind of complex emotional states of tension and anxiety caused by information users in the process of querying and using information due to their own cognitive type, personal information literacy, information quality, and retrieval tools. It is a type of negative emotional response generated by information users in information activities" [2].

In the era of big data, with the rapid proliferation of new media on the Internet, information anxiety has entered a new stage. It not only changes the personal emotional experience, but also has a negative effect on the emotions of the "personal sphere" and "public sphere", and the depth and breadth are also expanding [3].

III. FOUR SPECIFIC MANIFESTATIONS OF INFORMATION ANXIETY

A. *Network Information Anxiety*

Firstly, network information anxiety is mainly reflected in the following four aspects.

First, from an ideological side, information anxiety is manifested as a contradiction between personal need and a balance of ideological beliefs. As a very active and youthful group in a social group, college students are easy to quickly understand and master various network information technologies. They be good at using online media, such as Weibo, WeChat, to express their views, suggestions, and opinions to meet their need to be respected and recognized. Many students just like the feeling of being directly overwhelmed by this kind of scientific information flow. Sometimes playing computer games often directly makes these people feel strong psychological satisfaction. Figuring out a long-lost sense of identity in the virtual world leads to students continuous prolonged game time.

With the coverage of young people's moral needs continues to expand, when they face conflicting political ideology, beliefs, and principles of ethical behavior, they tend to demean themselves for a while, boast of themselves, and behave extremely. At the same time, the Internet has also changed the hobbies of college students, from a broad and popular choice or interest to a single, niche choice. They tend to have extreme ideas, stubborn attitudes, and it is not easy to make compromises, showing the ethical anxiety [4].

Secondly, from the perspective of psychology, information anxiety is manifested as a fundamental conflict between the integration of this emotional psychological experience and the change of life mood. In the change of life environment, there are certain phases for this kind of emotional and psychological experience. The emotional experience of college students is similar to middle school students, but also similar to adults. When college students encounter network information overload but cannot fully digest it, network information interference but cannot accurately filter, network information invalid and cannot be effectively obtained, facing the network information out of control and cannot be controlled in time, their inner state of mind will change. These changes often reflect immature emotional manifestations, such as the conflict between optimism and depression, anxiety and calm, and irritability and mildness. Many people feel extremely anxious and

uncomfortable. When students find that their Weibo and WeChat have not been followed or have not been upvoted by others on for a long time, they will feel disappointed. In real life, they feel their life is messy, have a sense of guilt, and suffer from the neurotic anxiety.

Thirdly, from a cognitive perspective, network information anxiety manifests itself as interference between cognitive and perception. College students have always insisted on standing at the forefront of the current global network buzzwords. They have created many popular online vocabulary, such as yyds, Internal scrolls, Versailles literature. These vocabulary are not only widely considered to be widespread in the whole network space, but also surpass the virtual environment and quickly spread to the real society, forming a unique way of cognition and expression for college students. At the same time, the Internet has also become the main way for college students to perceive the world and understand political and social culture. Their most common habit is to get up in the morning and turn on the smart phones to browse the news, to watch videos online after class, and to seek learning materials online. There are also some college students who are always afraid that they will not be able to keep up with the trends on the Internet. They are very willing to devote a lot of money and spare time or energy to study or collect some of the more popular things. They like information far better than genuine interpersonal and emotional face-to-face communication. Sometimes their over-reliance on the collection of network information will gradually make their thoughts and behaviors become dull. If things go on like this, it will affect their health. When facing realistic problems, realistic anxiety will occur.

Fourthly, from the perspective of behavior, network information anxiety is manifested as an obstacle to the choice of volitional characteristics and behavioral styles. [7] Modern society is a diversified society, and the Internet uses its advantages of speed and convenience to spread these diversified views quickly. It makes the space and scope of information anxiety gradually expand, causing the original personal information anxiety expands to group information anxiety. This means information anxiety space expanding from the "personal domain" to the "public domain", leading to social information anxiety or public anxiety. Motivated by this, college students also suffer from selective obstacles on online behaviors or interaction behaviors. For example, QQ and WeChat are online 24/7. Students like to interact with posts on Weibo and WeChat, or set up "guilds" in game to communicate and interact with the virtual world, to accomplish the so-called common "goals" and "desires." But in real life, they gradually change from decisive to hesitant, from strong to weak, from active to negative, from gregarious to withdraw, manifested as mixed information anxiety [3].

B. *The learning aspect of information anxiety*

At present, in terms of the quality and quantity of information dissemination, whether the most basic multimedia teaching or high-end online distance education, traditional teaching methods is far away. At present, college students not only have to receive a large amount of professional courses information in class, but also go to the library or electronic reading room to learn knowledge after class. They are faced with so much information. Sometimes, there may be conflicts

between different information. Maybe some of the information are being distorted or wrong. If there is no proper information processing method, blindly selecting and absorbing information will inevitably cause students' learning confusion. Therefore, some students often say that they don't know what books to read, how to learn knowledge quickly and correctly, and how to remember and use the knowledge they have learned. In serious cases, information anxiety will appear.

C. Information Anxiety in daily Life

With the development of China's science and technology, mobile phones, especially smart phones and computers, have gradually become more and more popular among college students. Fashionable "mobile phone addiction" and "Internet addiction" often appear in college students. Many college students are lacking the ability of necessary self-control, the ability of information processing, and low information literacy. When faced with such attractive information tools, they are busy playing with mobile phones and surfing the Internet all day long. WeChat is online 24 hours a day. Students frequently check the Mobile phones and e-mails. They surf the web aimlessly, and cannot leave the mobile phones alone for a short time. After one short time without phones, unexplainable anxiety and irritability emotion occur on the Internet. These are typical signs of information anxiety. Finally, it will cause mobile phone addiction or Internet addiction, which will have a serious impact on students' normal life and study. Of course, not all mobile phone addiction or Internet addiction is a result of information anxiety. [5].

IV. COPING METHODS FOR COLLEGE STUDENTS' INFORMATION ANXIETY UNDER THE BACKGROUND OF INFORMATION OVERLOAD

Aiming at the information anxiety among college students, we have to find the main reasons and the fundamental logic of the information anxiety. This will greatly help different departments of college to make good decisions and guidelines, promoting the students' balanced learning life. At the same time, understanding the formation mechanism of information anxiety can make college students truly clarify their needs and formulate their own development plans, so as to truly realize the progress goal of high education.

A. Guiding college students to develop correct values

The department of college education management should do a good job in dealing with various psychological education problems of all college students. Because college students themselves lack profound social life experience, and the incomplete world view. Their values are still in the preliminary stages. Their emotions often are adversely affected by a variety of distinct social ethical values, therefore, it is difficult for college students to carry out appropriate and proactive actions. It is easy to produce numerous psychological anxiety.

Leaders of relevant departments in universities should establish strict management measures as soon as possible. They should also try to promote college teachers to continuously improve teaching methods and become good friends with students. So as to actively guide college students to develop a correct outlook on social life and values, eliminating the influence of negative emotions caused by information anxiety.

B. Strengthening the dominance and authority of information released from college Platform

University departments should continue to increase funding and support for the construction of information management, and useful database projects. Also, it is necessary to increase the funding allocation support, technical and professional training support, so as to provide a broader information exchange platform for the college students.

First of all, colleges should create an online information management resource database as soon as possible, and regularly summarize, organize and publish various official notices of what the students need. Secondly, an electronic screen can be put in a fixed location on campus to regularly publish latest news or information. Finally, for the campus recruitment department, they can form a normalized exchange platform of employment information resource, and further to strengthen face-to-face information exchange between employment units and college students.

C. Improve the information supervision methods to ensure the quality of information resources

In order to effectively solve the outstanding problem of low quality of forwarding information from the college platform, which is not being trusted by students, the college department should change from the following two ways. First, related departments of universities need to develop an authoritative information network service platform, and guide university students to obtain information from these authoritative new media platforms, so as to promote the widespread dissemination of effective and useful information, and reduce the harmful interference caused by false information.

Secondly, to further improve the supervision and management of university information network, manager should adopt innovative information technology, new management methods, and apply optimization algorithms to filter false and redundant information, such as support vector machine. After these processes, college platform can provide students with effective and high-quality information or resources. This paper proposes one model to build the connection between efficient learning and the amount of information received. We calculate the balance point by support vector machine optimization algorithm. [6]

Consider a binary classification program with m training samples in the n -dimensional real space R^n . The set of each point A_i is represented by matrix A and corresponding values $y_i = \pm 1$ are denoted by D . For this problem, the unconstrained SVM is given by the following quadratic optimization program

$$\min_{w, \gamma, \nu} \frac{1}{2} (\|w\|_2^2 + \|\gamma\|_2^2) + \frac{1}{2} \nu \|e - D(Aw - e\gamma)\|_2^2. \quad (1)$$

The input datasets are from the questionnaires. There are four types of datasets, namely, the information acquisition anxiety, information selection anxiety, information processing & integration anxiety, and information credibility anxiety.

TABLE 1. THE INFORMATION ACQUISITION ANXIETY

Questions \ Degree Data	Totally Disagree	Disagree	Uncertain	Agree	Totally Agree
Q1. Too much interference information	9%	41%	27%	33%	17%
Q2. Overwhelmed by search tasks	6%	21%	33%	36%	4%
Q3. Don't know where to start	13%	39%	29%	17%	2%

TABLE 2. THE INFORMATION SELECTION ANXIETY

Questions \ Degree Data	Totally Disagree	Disagree	Uncertain	Agree	Totally Agree
Q1. Too much time to select information	5 %	10%	19%	39%	27%
Q2. Too much time to select information	4%	9%	29%	35%	23%
Q3. Easily annoyed when selecting large amounts of information	6%	13%	52%	29%	0%

TABLE 3. THE INFORMATION PROCESSING & INTEGRATION ANXIETY

Questions \ Degree Data	Totally Disagree	Disagree	Uncertain	Agree	Totally Agree
Q1. No clue when sorting information	9%	29%	33%	22%	7%
Q2. Inability to summarize information to generate new knowledge	4%	17%	27%	41%	11%
Q3. Unable to express the main point of view in one's own words	6%	25%	28%	31%	10%

TABLE 4. THE INFORMATION CREDIBILITY ANXIETY

Questions \ Degree Data	Totally Disagree	Disagree	Uncertain	Agree	Totally Agree
Q1. The efficiency of information search is very low for many repetitions	6%	21%	45%	28%	0%
Q2. Low quality of information after screening	5%	15%	26%	39%	15%
Q3. Too rough understanding of quick browsing information	9%	22%	30%	28%	11%

The model shows that support vector machine model can effectively filter redundant information and improve the efficiency of information search.

D. Focus on cultivating students' information and media literacy

As a college student, we should improve the ability to distinguish the sham and true, useful and redundant information. Facing the overloaded information, students should make independent and rational judgments, improve their own information literacy, and enhance their ability to discern information. At the same time, if students feel anxious and uneasy, we should seek for help in time, vent our emotions reasonably, and reduce the adverse effects of information anxiety on our course studies.

V. CONCLUSION

This article analyzes the information anxiety of college students under the background of information overload from three aspects, namely, the phenomena, causes, and solutions of information anxiety. In terms of individuals, college students should establish correct values, regulate their behavior, improve their information literacy, and cultivate their ability to distinguish right from wrong. From the college aspect, colleges should implement a strict supervision system and resolutely resist the input of false information. Teaching and publicity department should establish credible information filtering platforms to help students filter redundant information. At the same time, colleges or universities ought to increase their efforts to help students prepare for the information overload on the psychological side. Psychological health institutions should provide assistance and related service. In addition, schools can offer information search courses to improve students' information retrieval capabilities. Information overload is a common situation, and the key is that we should treat it in the right way. When information anxiety occurs, it should be handled actively, so that students in the information age can overcome information anxiety.

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REFERENCES

- [1] MK. Guo, Classification of Knowledge and Reference for Management Decision. Reference for Decision, 2001, pp. 4-9.
- [2] JD. Cao, C. Wang, and X. Liu. Research on the Influencing Factors of User Information Anxiety and Its Intervention Models. Information Science, 2010, pp.1464-1468.
- [3] YF. Jiang, On knowledge organization. Library and Information Work, 2000, pp.5-10.
- [4] YH. Liu, Causes and Countermeasures of Information Anxiety of College Students. Zhengzhou University, 2013
- [5] FY. Tao, the characteristics, causes and coping strategies of college students' network information anxiety, Shanghai Ocean University, 2013
- [6] E. Wang, ZY. Wang, Q. Wu. One Novel Class of Bézier Smooth Semi-Supervised Support Vector Machines for Classification. Neural Computing And Applications, 2021, pp. 9975-9991.
- [7] E. Wang, Four Dilemmas of the "Superstring theory" and new responses from the "Singularity theory" in the view of Information Ontology. Synthese, 2021, pp.1-9.