Construction of Early Warning Mechanism of Network Public Opinion in Colleges and Universities under Big Data Environment

Run Xi*

Sichuan Vocational and Technical College, Suining, China
xirun009210@scvtc.edu.cn
*Corresponding author

Abstract: *With the advent of the data age, everyone is in the torrent of information. At the same time, with the development and popularization of the Internet, information exchanges between people have become more convenient and faster, and the resulting early warning of network public opinion (NPO) has become an object we have to pay attention to. For colleges and universities, the construction of network public opinion warning (NPOW) is of great significance. This research aims to study the construction of NPO early warning mechanism in colleges and universities under the big data environment. Based on the understanding of the relevant theories of NPO, this article first explains the construction goals and principles of the early warning mechanism of NPO in colleges and universities, and uses a questionnaire survey method to study the necessity and effect of establishing an early warning mechanism of NPO in colleges and universities, and proposes Countermeasures that universities can refer to when constructing an early warning mechanism for NPO. According to the questionnaire "Do you think the school needs to provide early warning of NPO", 10.7% of college students indicated that it is unnecessary. 15.84% of college students think that it doesn't matter to give early warning of NPO, which shows that the current colleges and universities lack in-depth understanding of early warning of NPO.*

Keywords: *Big Data; Network Public Opinion; Early Warning Mechanism; Mechanism Construction*

1. Introduction

NPO is a special form of social public opinion. Using the Internet as a media of communication, the impact of it involves politics, economy, culture, and life [1-2]. Especially in the current era of big data, the amount of information and data flooded in the NPO environment has exploded [3-4]. In addition, netizens are more enthusiastic about participating in NPO events, and it is easy to generate rumors and negative emotions, and the NPO information Evolve into NPO crisis information [5-6]. Colleges and universities are the main positions where NPO occurs. If public opinion information can be effectively identified and preventively controlled during the budding period of public opinion, it will help to reduce the adverse effects of public opinion crisis events, thereby reducing the cost of governance crisis in colleges and universities [7-8].

Many domestic and foreign scholars have conducted extensive research on building NPOW mechanisms in colleges and universities. For example, Busemeyer MR analyzed the characteristics of NPO in colleges and universities in the context of big data and suggested the use of big data in early warning of NPO in colleges and universities [9]. Peng LJ discussed the NPO's emergency mechanism. He believes that NPOs are connected through three links: monitoring, early warning, and governance [10]. Li J conducted research on NPO development of university students, proposed some strategies and methods to solve [11].

This article focuses on the status quo of NPO early warning in colleges and universities under the background of big data, and deeply analyzes the existing problems and their causes. Starting from the current goals and principles of constructing NPOW in colleges and universities, combined with the application of big data, proposes a college NPOW strategy. Then, through the questionnaire survey method, the necessity and effect of the establishment of the NPOW mechanism of H colleges are investigated and analyzed, and the countermeasures for constructing the NPOW mechanism of colleges and universities are discussed. It is clear that colleges and universities should seize the opportunity and

actively explore new paths. It is also necessary to improve the construction of a team of professionals.

2. Construction of an Early Warning Mechanism for NPO in Colleges and Universities under the Big Data Environment

2.1 Construction of an Early Warning Mechanism for NPO Crisis in Colleges and Universities under the Big Data Environment.

(1) Goals and principles

1) Assist universities in making scientific decisions

By forming an overall understanding of the school's development through NPO, decision-makers can more easily and effectively recognize the different needs of the school's development stage, and make public decisions by discovering public opinion and understanding public sentiment. This is an effective solution. Coordinating the operation of the NPO early warning system can promptly understand public opinion information on the Internet, and report potential public opinion crises to higher-level departments and leaders, which can assist universities in making scientific decisions.

2) Improve the ability of colleges and universities to respond to NPO.

Early warning work is a very important part of the entire NPO management work. High-quality early warning work can prevent the spread and spread of negative NPO, and effectively avoid the vicious development and evolution of NPO emergencies from virtual space to real society. NPO crises usually originate from small public opinions that are easily overlooked. If colleges and universities at all levels lack a keen insight into emerging public opinions, and early warning work is not carried out in a timely manner, it will usually lead to worsening and escalation of harmful public opinion events, making it difficult to control s consequence.

3) Strengthen the coordination and cooperation between functional departments.

NPO crisis events usually have the characteristics of wide proliferation and high harm, which determines that the management of NPO in colleges and universities cannot be limited to a single department, and requires various departments to exchange information and strengthen cooperation. Constructing a scientific and efficient NPO early warning mechanism is convenient for realizing the mutual transmission, exchange and sharing of NPO information in a timely manner.

(2) Principles of constructing early warning mechanism

1) The principle of comprehensiveness

The principle of comprehensiveness is more about not omitting any possible public opinion crisis risks. If the relevant public opinion information cannot be fully grasped in the NPO crisis identification stage, and the possible public opinion crisis can be identified, then it will be ignored in the crisis evaluation stage. This risk will not be evaluated. Once this problem occurs, the public opinion crisis has a small impact area and there is still room for recovery. If the impact scope is large, it may bring huge challenges to the next stage of governance. Therefore, in the early warning of the NPO crisis in colleges and universities the first thing to follow when the mechanism is well established is the principle of comprehensiveness.

2) Principle of accuracy

The principle of correctness is based on completeness. On the one hand, it is necessary to have an accurate classification of the identified types of NPO to provide a good basis for the assessment of public opinion. On the other hand, it is necessary to accurately analyze the causes of public anger. To ensure that the next developments of NPO can be understood and provide the basis for early warning from the university.

3) Systematic principles

The early warning of NPO is a complex process that includes multiple procedures, involving many fields, and multiple indicators are connected to each other [12]. It can reflect the characteristics of NPO from multiple angles and multiple levels, and it requires construction The early warning mechanism must be able to finally be presented as a relatively complete system.

2.2 Countermeasures for Constructing an Early Warning Mechanism of NPO in Colleges and Universities under the Big Data Environment

(1) Improve big data expertise

First of all, colleges and universities should integrate the various systems that have been built, and carry out unified planning and comprehensive upgrades to the corresponding hardware equipment, so that the software and hardware resources of the colleges and universities can be further optimized, so as to build a complete set of big data application platform to lay a good foundation. Secondly, although the current big data technology has the corresponding simple processing capabilities, it is not perfect and can be improved in many ways, therefore, updating and upgrading big data technology is very necessary. In a university, if there is a relatively complete and advanced big data technology system, there can be many positive results in the development of early warning work by the NPO.

(2) Build a big data monitoring system

Use advanced technical means to establish a public opinion monitoring system to realize the full-process monitoring of public opinion, understand its origin and the entire communication process of its development, so as to prevent the occurrence of public opinion crisis events. Using big data, advance the starting point of the public opinion management process beforehand, and then by collecting data and accumulating it, the overall situation of the incident can be quickly analyzed and effectively prevented. In the construction of the NPO monitoring system, it is necessary to continuously break down communication barriers and build a database with wide coverage and strong accuracy.

2.3 Real-Time Data Stream Clustering Analysis Algorithm

The main algorithm flow is: first randomly select k data objects as the initial center of the cluster, and the remaining data objects select the nearest cluster according to the distance to each cluster. They are divided into the clusters respectively. After this process is completed, the average value of the clusters is recalculated to obtain a new cluster center, and this process is repeated until the standard function converges. The distance calculation function is generally Euclidean distance, the distance to the data object. The convergence criterion is usually the square error criterion, namely:

$$E = \sum_{i=1}^{k} \sum_{p \in C_t} |p - m_i|^2 \quad (1)$$

Among them, p represents any data object, E is the sum of squared errors of all data objects, and m_i is the average value of the cluster C_i where data p is located.

The grid density is the sum of the coefficients of the data points in each grid, denoted as $D(g,t)$. According to the different density, it is divided into dense grid, sparse grid, and transition grid. Specify a dense threshold of D_m and a sparse threshold of D_i, and the average grid density is:

$$D_{avg} = \sum_{i-1}^{m} D_i / m \quad (2)$$

3. Investigation and Research on the Construction of NPO Early Warning Mechanism in Colleges and Universities under the Big Data Environment

3.1 Survey Design

The prerequisite for colleges and universities to carry out NPOW work is to analyze and summarize the current situation and understand the current guidance status. Through discovering problems, analyzing problems, and putting forward targeted suggestions, we can effectively improve the early warning capabilities of NPO in colleges and universities.

3.2 Survey Content

This research carried out actual research, issued questionnaires and conducted interviews in H colleges and universities, contacted college student workers and relevant departments of online information, and investigated the work related to big data and NPO early warning. In order to understand the current situation of NPOW work in colleges and universities, the survey objects are college students in H colleges and universities, and the survey work is carried out through questionnaire surveys.

3.3 Investigation Method

The survey adopted random sampling and quota sampling. 1,000 questionnaires were issued and 972 were effectively recovered. In addition, this research conducted in-depth interviews and exchanges on the current NPOW situation through field visits to the universities where the questionnaire was issued.

4. Investigation and Analysis of the Construction of the Early Warning Mechanism of NPO in Colleges and Universities Under the Big Data Environment

4.1 Necessity Investigation of the Early Warning Mechanism of NPO in Colleges and Universities under the Big Data Environment

The survey results of "Do you think schools need to provide NPOW" are shown in Table 1: 104 college students expressed freedom of speech and there is no need to establish an early warning mechanism. There are 154 college students who think it doesn't matter to give warnings to NPO. There are 514 college students who believe that public opinion warning should be normalized, and it is very necessary to build an NPOW mechanism, and should not only pay attention to problems when they encounter problems.

Table 1: "Whether schools need to establish an early warning mechanism for NPO" questionnaire

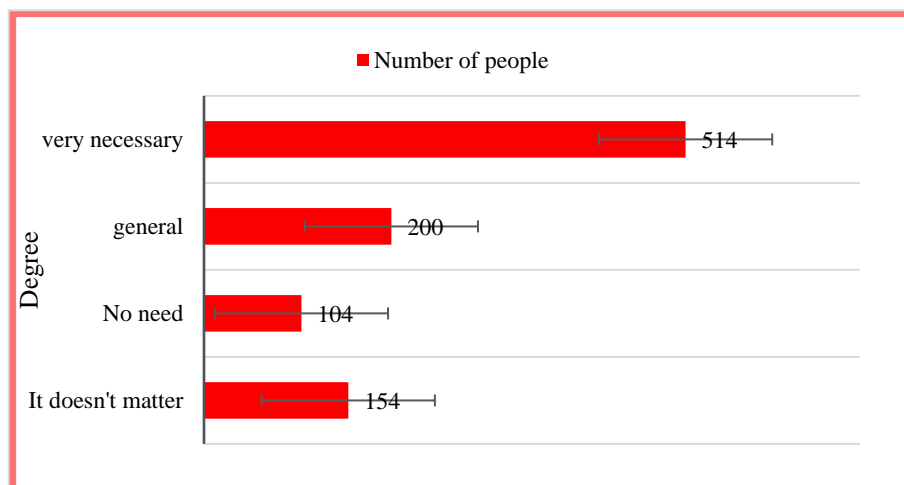| degree	Number of people	proportion
very necessary	514	52.88%
general	200	20.58%
No need	104	10.70%
It doesn't matter	154	15.84%

Figure 1: "Whether schools need to establish an early warning mechanism for NPO" analysis diagram

From Figure 1, on the one hand, students have an affirmative and necessary attitude towards the establishment of an early warning mechanism for public opinion in schools, and more than half of the people feel that it is necessary to establish an early warning mechanism for NPO. But on the other hand, there are still more than 26% of students believe that it does not matter or there is no need to establish this mechanism. It can be seen that the current universities lack in-depth understanding of NPO early warning of emergencies.

4.2 Effect of NPOW in Colleges and Universities under the Big Data Environment

The survey results of "How effective is the NPOW of your school" are shown in Table 2: 200 college students said that the NPOW situation is not optimistic and has no effect. There are 680 college students who think that the school's public opinion warning work is not good, and occasionally the warning fails. Only 92 college students believe that the current NPOW of the school is powerful, which can eliminate adverse effects and clarify the facts in a timely manner.

Table 2: Questionnaire on "How effective is the OPOW of your school?"

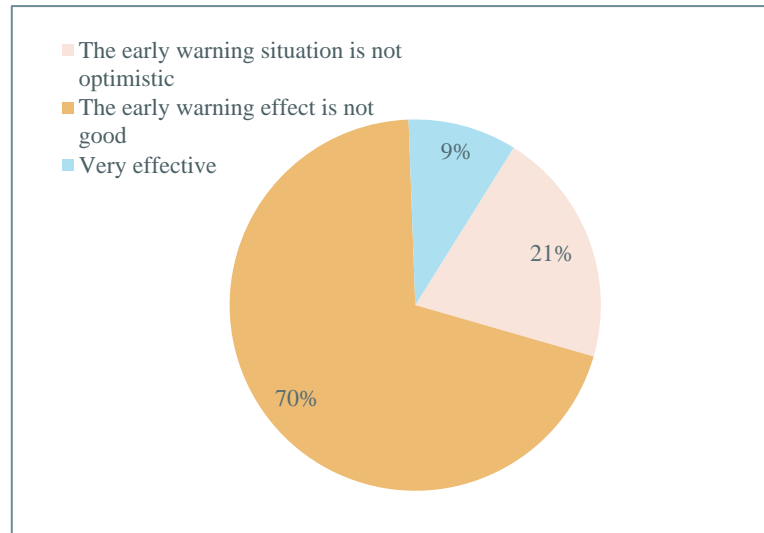| effect	Number of people	proportion
The early warning situation is not optimistic	200	20.58%
The early warning effect is not good	680	69.96%
Very effective	92	9.47%

Figure 2: Analysis of "How effective is the OPOW of your school?"

By observing Figure 2, it can be seen that most college students are dissatisfied with the NPOW effect of their school. The vast majority of college students believe that the current school's early warning of NPO is very weak and needs to be further improved. Sometimes they look forward to the school being able to explain and expound all kinds of information in a timely manner, inform students of the most authoritative and true information, and eliminate panic. However, this situation has not attracted the attention of the relevant departments of the school.

5. Conclusion

The NPO of colleges and universities is a dynamic reflection of the dynamics of college students' thinking and learning and life. With the help of the occult characteristics of the Internet, college students can show their most true inner world on the Internet. Therefore, through timely and effective NPO monitoring and early warning, problems can be discovered and dealt with in a timely manner, and response plans can be formulated efficiently, changing the passive situation of public opinion management in the past, and effectively preventing the emergence of NPO crises. At the same time, college workers should also analyze and think from the perspective of students when carrying out NPOW work, and solve the problems that students are most concerned about. Only by starting from college students can we truly find the key to the problem.

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