Effective Ways to Cultivate the Autonomous Learning Ability of Minority College Students under the Network Big Data Environment

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Abstract. The era of big data provides convenience for college students to study independently. College teachers can make use of the relevant characteristics of big data to improve teaching methods, enrich teaching content and guide the independent learning of college students with scientific teaching evaluation, and explore the cultivation mode of college students' independent learning ability. Big data in order to better research network environment of ethnic minorities is effective way to cultivate college students' autonomous learning ability, this study in a university of ethnic minority college students as the research object, through a combination of big data technology to improve the way of the network teaching, through questionnaire as tools, supplemented by semistructured interview, investigation of ethnic minority college students' autonomous learning ability, from the autonomous learning ability, independent learning behavior, autonomous learning psychology discusses three dimensions of ethnic minority college students' autonomous learning situation, and discusses how to develop ethnic minority college students' autonomous learning ability, according to the results, After combining big data teaching, the attendance rate increased by 21.7%.

Keywords: Big Data Environment, Network Teaching, Teaching Adaptability, Autonomous Learning

1. Introduction
The Internet and cloud computing have not only attracted the attention of academic circles, but also in the field of higher education. At present, the research on the application of big data in basic education mainly focuses on the large amount of educational data generated and automatically accumulated in educational courses through digital management of educational resources[1-2]. In these daily activities, various behavioral and psychological databases of human beings can be combined into a broad sense of big data of daily education activities, and the education database of online learning education platform can also be collectively referred to as the narrow sense of big data of education[3-4].

The rapid development of the practice and awareness of nursing, midwifery and medicine as important interconnected workforces means that a variety of course opportunities are required. Bell A addresses the challenge for health care educators to expand student participation and participation...
through cross-disciplinary education, enabling students to improve their knowledge and understanding of current best practices by creating learning environments and fostering a desire to foster situational awareness, autonomous learning and contribution to patient advocacy through student interaction. Flipped learning improves students' understanding of pharmacological concepts and the application of pharmaceutical science in practice. Repetition of elective courses is conducive to independent learning. Personal errors by health professionals, including lack of knowledge and poor communication, have been identified as increasing the likelihood of medication errors. Hanson surveyed nursing students' views on how flipped classroom improves their understanding of pharmacological principles. The purpose of Paul Alhassan Issahaku was to assess the extent to which background characteristics, students' attitudes towards learning and students' use of social media affect the academic performance of Ghanaian undergraduates. It is assumed that previous performance, learning time, family income, personal learning plan, regular attendance at lectures, participation in class discussions, taking notes during lectures, drinking and using social media will affect students' average GPA.

In this paper through the questionnaire survey and data analysis of minority college students, combined with the individual depth interview, on the basis of the theory of culture, to explore the method and the analysis of a seat, from family, education, social environment, cultural adaptation and personality characteristics of understanding and interpretation of ethnic minority influence factors of college students' autonomous learning, explores how to in big data provide better autonomous learning environment.

2. Cultivation of independent learning ability of college students of ethnic minorities in the environment of online big data

2.1. Independent learning ability
In the face of the development of social informatization, the deepening of network popularization, the double impact of diversification and information technology resources, how to effectively improve the comprehensive learning ability of Chinese college students has become an important issue that the current society urgently needs to study. On the one hand, the career development trend of "Internet + education" provides basic guarantee for the improvement of their daily study and living conditions; on the other hand, they can provide professional technical support when they are good at coping with various challenges. The comprehensive ability of college students' independent learning is mainly divided into three main aspects of college students' personal information processing, autonomous and teamwork comprehensive learning. It is a comprehensive reflection of different historical backgrounds, a realistic cultural demand, and a perfect comprehensive display of the comprehensive quality of college students in China. Therefore, it is of great social practical significance to study how to cultivate students' learning and practice ability independently.

2.2. Big data teaching platform
In the algorithm problem of teaching platform, statistical data generally meet the normal distribution, which is reasonable and extensive in physics, and the normal distribution is relatively simple in mathematical processing. \(N(u, \sigma^2)\) only contains two parameters, mean value and variance, and USES normal distribution function as the function form of conditional probability density:

\[
P(x) = \frac{1}{\sqrt{2\pi\sigma}} \exp\left[-\frac{1}{2} \left(\frac{x-u}{\sigma}\right)^2 \right] = N(u, \sigma^2)
\] (1)

The conditional probability density is expressed by the normal probability density function of multidimensional variables as follows:

\[
P(x|\omega_i) = -\frac{1}{2} (X - \mu_i)^\top S_i^{-1} (X - \mu_i) - n \ln 2\pi - \frac{1}{2} \ln |S_i|
\] (2)
3. Experimental verification scheme

3.1. Experimental background
The background of "Internet + education" is interactive, multimedia, open and diversified, which constitute a new network learning environment. In such an environment, a highly integrated database is formed, which makes the knowledge increase geometrically. Therefore, how to extract learning resources and improve learning efficiency in the era of complex information explosion is an urgent problem to be answered. Therefore, the most core ability that needs to be possessed is the information processing ability of college students. Combining with the background of big data, how to improve their self-learning ability is the focus of this paper.

3.2. Experimental design
Through the issuance and collection of questionnaires, this study investigated and studied the autonomous learning ability of ethnic minority college students in a university in order to obtain the following information: The real demands of these college students for their own learning ability and the change of their independent learning ability under the big data teaching platform. At the same time, the author interviewed minority college students of different grades and majors to make up for the deficiencies in the questionnaire, so as to further understand the current learning ability of minority college students under the background of "Internet + education" and to improve the strategy of autonomous learning ability. Some experimental results are shown in Table 1.

| The test students | Evaluation of big data teaching platform | Assessment of self-learning ability |
|-------------------|-----------------------------------------|-------------------------------------|
| Group 1           | 85.8                                    | 82.1                                |
| Group 2           | 86.3                                    | 86.1                                |
| Group 3           | 89.6                                    | 77.6                                |
| Group 4           | 91.3                                    | 75.6                                |
| Group 5           | 90.9                                    | 86.5                                |

4. Analysis of experimental results

4.1. Analysis of the cultivation of autonomous learning ability of minority college students under the network big data environment
As shown in Figure 1, the author made predictions on 131 minority college students in a certain university, covering various aspects such as gender, grade, major, student origin, etc. Besides, the reliability and validity of the initial questionnaire were analyzed, the unqualified questions were deleted, and the KMO test and Bartlett spherical inspection scale were adopted. According to the first measurement analysis, the KMO test value of learning ability of these minority college students was 0.864, the Bartlett ball test approximate chi-square value was 4087.068, with a significance of 0.000, and Cronbach's Salpha coefficient was 0.957, indicating that the questionnaire was suitable for factor analysis. In the second measurement analysis, it was found that the KMO test value of the autonomous learning ability of college students was 0.877, and the Bartlett ball test approximate chi-square value was 2710.852, with a significance of 0.000. In further independent sample T-test, the factor load matrix analysis after principal component and orthogonal rotation treatment was suitable for retaining three factors. After specific analysis of the items, factors were further integrated to eliminate the options with insufficient explanatory power for the results. Finally, three factors were adopted and renamed as information processing ability, independent learning ability and cooperative learning ability. Cronbach's Salpha coefficient of the reconstructed questionnaire after exploratory factor
analysis was 0.944, and the coefficients of each dimension were 0.874, 0.900 and 0.925 in turn. The data model is qualified for factor analysis.

![Figure 1. Analysis of the investigation of minority college students](image1)

The average score of learning adaptability of minority college students in this university is 3.2996, which is within the range of 3-3.75 critical points and a little lower in the middle of this range, indicating that their learning adaptability is generally a little lower. The median score of the college students' learning adaptability is 3.2889, indicating that more than half of the students' learning adaptability is at or below the average level. To be specific, 18.9% of college students' learning adaptability is at a low level, 70.4% at an average level, 10.2% at a high level, and 0.5% at a very high level. It is known that nearly 90% (89.3%) of college students' learning adaptability is at the average or below level.

As shown in Figure 2, by analyzing the basic information of self-learning ability of minority college students and taking gender as a measurement index, it is found that female students are significantly more than male students, with the percentage of male students being 37.9% and that of female students being 62.1%. Among them, taking major as the measurement index, it is found that there is a large gap between the proportion of liberal arts and science and engineering, in which the number of science and engineering students accounts for 62.1% of the total. The arts accounted for 37.9 per cent of the total. It is found that the proportion difference between the population living in cities and towns is not big. Through the questionnaire survey found that, on average, use the Internet every day time within 2-5 hours, the number of percentage of 53.3%, that with the development of network information technology, college students increase in the number of Internet time, time for learning network, however, very few, this would require the reason on the Internet, formulate corresponding strategies to guide college students to help them form good habits of the Internet, reasonable and effective to study.

![Figure 2. Comparative analysis under different measurement indicators](image2)
To sum up, university teachers can establish an adaptive learning system based on big data by using modern information technology systems such as micro-platform, cloud network course and World University City, as well as the flipped classroom teaching method to make students become students' initiators and create an atmosphere of independent learning. According to the dynamic characteristics of big data, university teachers should change from former teaching resource providers to resource integrators, collect various dispersed resources and information from the network extensively and then analyze and process them into useful corpus. In addition, the data generated by the analysis of the learners learning process data and mining value information, tracking, and focus on learners' learning process, provide timely help to learners to push the right corpus resources, provide conforms to the individual needs and opportunities for personal development, such as the APP can real-time analysis of the interaction between learners and online resources, transform traditional syntactic teaching to stimulate the minority students' autonomous learning interest and improve autonomous learning ability.

4.2 Suggestions on cultivating the autonomous learning ability of minority college students under the network big data environment

In the era of data economy, information education has a huge amount of resources and is accompanied by explosive growth. Faced with the numerous and complicated information sharing and information education resources stored in cloud computing services, college students are often at a loss what to do. Teachers on the data of the era of autonomous learning method is more important than ever for instruction, such as how to guide them in the big data era have what resources can make full use of network resources sharing course, learners how to choose and how to make full use of these Shared resources, and so on, to guide their learning from passive to accept natural type to active direct absorption type of learning method. Method at the same time, autonomous learning behavior guidance personnel according to the different work tasks of teachers and students to learn, even using their online learning work constantly produce autonomous learning behavior in the process of path information data, to predict the evaluation of students' autonomous learning preferences, the learning style preferences, so as to help students corresponding design guidance and skills training, online learning strategies to optimize the path for the learners' autonomous learning behavior, to promote reflection on learners gradually strengthen the awareness of promote students choose their learning method and thinking ability.

In the development of teaching effectiveness evaluation methods, teachers can generally use a combination of online and offline teaching data based on a variety of process methods to evaluate teaching. Real big data records in the college students in the digital education study left a lot about digital pieces, in the process of teaching evaluation from a traditional teaching empirical objectivity to modern development, for teachers in colleges and universities student provides the most direct, the most objective and accurate student evaluation and reference for the analysis of the teachers and the students learning, fairness and justice to undergraduate education evaluation, efforts for all college students to build a harmonious relaxed learning good life environment. In addition, the education of scientific quality evaluation, it is the object of study is not only for autonomous learning of college students, the teacher can also make full use of all kinds of modern digital information processing technology and a variety of information sources to assess his classroom teaching situation, back in the ACTS of moral education in the classroom, summarizes advantages and disadvantages of teaching, moral education teaching behaviors of reflection in the teaching process, methods and teaching effects, etc., improve the teaching effect, which can improve the students' autonomous learning effect, also can fully arouse the students' learning autonomy and enthusiasm.

5. Conclusion

Big data in this paper, based on the network environment of ethnic minority college students' autonomous learning ability research, combined with the college students in ethnic areas of questionnaire, interview, established the corresponding research conceptual framework, the survey
tool, discusses the existing problems in the ethnic minority college students' autonomous learning ability, in the end, based on the research findings and research conclusion, put forward promote ethnic minority college students' autonomous learning ability of effective Suggestions.

Acknowledgments
1. This work was supported by The 13th five year plan of Educational Science in Jiangxi Province(No.20YB241);
2. Research topics of Humanities and Social Sciences in NanChang Institute of Science and Technology(No.NGRW-19-06).

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