



Factors Influencing College Students' Independent Learning Ability in an Education Information Model - An Empirical Study of Guangdong G University as an Example

Youling Li¹, Ting Deng², and Binger Chen³(✉)

¹ Graduate School of Rattana Bundit University, Bangkok 10240, Thailand

² Guangdong University of Foreign Studies South China Business College, Guangzhou 510080, China

³ School of Sociology and Public Administration, Guangdong University of Foreign Studies, Guangzhou, China

20221150003@gdufs.edu.cn

Abstract. This paper is based on a questionnaire survey conducted by 250 college students enrolled in Guangdong G University. The results of the empirical analysis indicate that the usability of online education learning technology, learning resources of online education, interaction of students in online education learning, and evaluation of online education learning are the main factors that affect college students' autonomous learning ability. Under the mode of educational information, the following measures can be considered to enhance the independent learning ability of college students: (1) Enriching the construction of learning resources. (2) Enhancing students' awareness of cooperative learning. (3) Focusing on independent learning assessment under the education information mode. (4) Optimizing the independent learning platform for college students.

Keywords: mode of educational information · independent learning ability of college students · influencing factors

1 Introduction

At a time when the pace of information modernization is accelerating and international competition is intensifying, China is faced with many more requirements to create active advocates of a learning society and promote the level of talent. In 2015, the State Council issued a document: Guiding Opinions on Actively Promoting the “Internet Plus”, Action [1]. “Education information”, is the universal application and promotion of information and information technology in the field of education and teaching, as well as in education and teaching departments [2]. According to the current study status, the article proposes the following study question: What factors affect the development of college students' self-directed learning ability in the education information model? What are the specific ways in which different elements influence the development of college students' self-directed learning skills?

© The Author(s) 2023

C. F. Peng et al. (Eds.): EIMT 2023, AHSSEH 8, pp. 1046–1052, 2023.

https://doi.org/10.2991/978-94-6463-192-0_136

2 Literature Review and Study Hypothesis

2.1 Literature Review

Study Related to Self-directed Learning Ability

Through sorting out the literature, the study on learners' autonomous learning ability is divided into two parts: internal and external influencing factors. Li and Mingjin's (2019) data analysis shows that the online learning environment has a direct impact on learners' ability, and learners' self-learning ability will also indirectly affect self-learning ability through the intermediate role of self-efficacy [3]. Therefore, under the mode of educational information, whether different factors have an impact on learners' autonomous learning ability is the focus of this study. The process of education information will provide strong support and guarantee independent learning. Schiaffino also pointed out that there is a positive correlation between learners' motivation and their self-directed learning ability in online learning environments.

2.2 Review of Variable Relationships and Study Hypotheses

The Relationship between Online Education Learning and Self-learning Ability

In 1998, Zimmerman provided a deeper description of self-directed learning [4]. In the study, he proposed a study model in which he pointed out that the learning environment of learners directly affects learners' learning motivation and learning strategies and affects learners' autonomous learning ability. Therefore, this study makes the following hypothesis:

H1: Online education learning has a positive effect on self-directed learning ability.

The Relationship between Online Education Technology Usability and Autonomous Learning Ability

In addition to paying attention to the acceptance of information technology by internal psychological conditions, learners in the online education learning environment should also pay special attention to the technical conditions available in the environment when applying the education information environment [5]. Therefore, this study makes the following hypothesis:

H2: The usability of online education technology has a positive impact on autonomous learning ability.

The Relationship between Online Education Learning Resources and Autonomous Learning Ability

Online education learning resources are an important dimension of the online education learning environment [6]. Low-value online education learning resources can reduce the efficiency of learners' access to effective information, weaken learners' motivation to learn, and thus hinder the development of their independent learning abilities. Therefore, this study makes the following hypothesis:

H3: Online education learning resources have a positive impact on autonomous learning.

The Relationship between Students' Interaction and Autonomous Learning Ability in Online Education

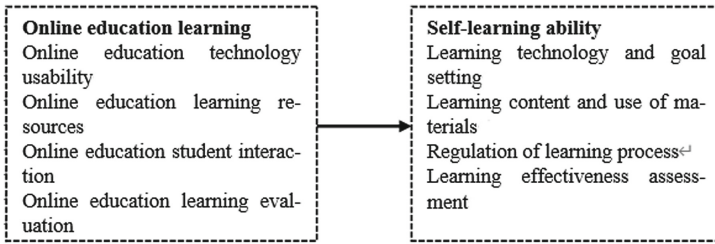


Fig. 1. Study Model

Collaborative learning among learners can enhance learners' ability to learn effectively by developing learners' relevance, enhancing their learning enthusiasm, displaying their personal value, and more consciously and actively assuming corresponding responsibilities for independent learning [7, 8]. Therefore, this study makes the following hypothesis:

H4: The interaction of online education students has a positive effect on self-directed learning ability.

The Relationship between Evaluation of Online Education Learning and Self-directed Learning Ability

Evaluation of online education learning refers to the process of assessing the learning status of learners and the means of learning in the education information technology mode [9]. A mature evaluation system can help cultivate learners' self-learning ability to a certain extent [10]. Therefore, this study makes the following hypothesis:

H5: Online education learning evaluation has a positive impact on autonomous learning ability.

Based on the above literature review and study assumptions on educational information model and autonomous learning ability, the study model of this paper is shown in Fig. 1.

3 Empirical Analysis of College Students' Self-directed Learning Ability Under the Education Information Model

3.1 Reliability Verification

The online education learning scale used in the study and the scale of college students' autonomous learning ability under the online education learning mode adopt the Cronbach coefficient in SPSS software. The Cronbach coefficient of eight variables is greater than 0.7, which indicates that the reliability of the scale is good and can be analyzed in the next step. The results of reliability verification are shown in Table 1.

3.2 Correlation Analysis of Study Variables and Autonomous Learning Ability

The correlation between each variable and dependent variable is shown in Table 2. The *p* values of all four independent variables were less than 0.01, indicating that online

Table 1. Test of questionnaire reliability

Scale	Variable	Number of Items	Cronbach's α
Online Education Learning Scale	Availability of online education technology	2	0.744
	Online education learning resources	5	0.866
	Online education student interaction	6	0.893
	Online education learning evaluation	3	0.802
Self-learning Ability Scale of College Students Under Online Education Learning Mode	Learning technology and goal setting	5	0.818
	Learning content and the use of data	4	0.836
	Regulation of learning process	4	0.842
	Assessment of learning effect	4	0.843

education learning had a significant positive influence on college students' self-directed learning ability. Among them, the correlation coefficient of online education learning evaluation is the highest ($r = 0.536 < 0.01$), which indicates that teachers provide students with more evaluation activities to effectively improve their autonomous learning ability.

3.3 Regression Analysis of Online Education Learning on Autonomous Ability

Then, we further analyze the relationship between online education learning environment factors and autonomous learning ability through regression analysis. The results of the regression analysis are shown in Table 3. The regression coefficients of the four dimensions of "online education technology usability", "online education learning resources", "interaction of online education student", and "online education learning evaluation" all reached significance.

Table 2. Pearson Correlation Analysis Results of Study Variables

	Availability of online education technology	Online education learning resources	Online education student interaction	Online education learning evaluation	Self-learning Ability
Availability of online education technology	1				
Online education learning resources	.354**	1			
Online education student interaction	.434**	.592**	1		
Online education learning evaluation	.264**	.559**	.532**	1	
Self-learning Ability	.399**	.446**	.418**	.536**	1

Note: ** $p < 0.01$, * $p < 0.05$

4 Conclusions and Suggestions

Based on the analysis of the questionnaire survey of 250 college students at Guangdong G University, the study conclusions are summarized in Table 4.

This study proposes recommendations to enhance students' independent learning ability based on four aspects: (1) Enrich learning resource construction. Online education learning resources can be designed based on three learning stage modules: preclass, in-class and postclass learning. (2) Enhance students' sense of cooperative learning. When building the learning environment of the educational information model, efforts should be made to enhance the online interactive experience of learners. (3) Focus on self-directed learning assessment in the education information technology model. Assessment at the appropriate time during the learning process can provide learners with appropriate guidance and feedback, enabling learners to organize their self-learning and fully assist their learning through appropriate feedback. (4) Optimize the independent learning platform for college students. Online education course resources should include educational courseware cases and other learning materials, which is the basic guarantee for ensuring that students conduct independent learning.

Table 3. Analysis of the Influence of Online Education Learning on Autonomous Learning Ability

Dependent Variable	Self-learning Ability					
	Standardized Regression Coefficient	t value	The Significance of t	R ²	F value	The Significance of F
Availability of online education technology	0.19	4.59	0.000			
Online education learning resources	0.11	1.87	0.006			
Online education student interaction	0.21	4.10	0.000			
Online education learning evaluation	0.22	4.50	0.016	0.24	57.23	0.000

Table 4. Conclusion of the Hypothetic Test

Hypothesis	Hypothetical contents	Conclusion
H1	Online educational learning has a positive impact on autonomous learning ability	valid
H2	The usability of online education technology has a positive impact on the autonomous learning ability	valid
H3	Online education learning resources have a positive impact on self-directed learning ability	valid
H4	Online education student interaction has a positive effect on self-directed learning ability	valid
H5	Online education learning assessment has a positive impact on self-directed learning ability	valid

References

1. The State Council. Guiding Opinions of the State Council on Actively Promoting the Action of "Internet plus" [J] Laboratory Science, 2015 (04): 9–9.

2. Han Xiaoling and Xu Juan. Construction of Evaluation Index System of Blended Learning Curriculum Resources [J] Modern Educational Technology, 2018, 028 (012): 34–40.
3. Koles P G , Stolfi A , Borges N J , et al. The impact of team-based learning on medical students' academic performance.[J]. Academic Medicine Journal of the Association of American Medical Colleges, 2010, 85(11):1739–45.
4. Zimmerman, Barry J . Becoming a self-regulated learner: Which are the key subprocesses?[J]. Contemporary Educational Psychology, 1986, 11(4):307–313.
5. Wu YT , Tsai CC . Information commitments: evaluative standards and information searching strategies in web-based learning environments[J]. Journal of Computer Assisted Learning, 2010, 21(5):374-385.
6. Xiao Fei. Learning Autonomy and How to Cultivate Language Learning Autonomy.[J]. Foreign Languages, 2002 (6): 5.
7. Dong Qi, Zhou Yong. An Experimental Study on Self-monitoring of Students' Learning[J]. Journal of Beijing Normal University: Social Science Edition, 1995(1):7.
8. Xu Zhouyin, Li Mingjin. Analysis of factors influencing undergraduate nursing students' self-directed learning ability[J]. Journal of Nursing, 2019, 34 (23): 4.
9. Zimmerman B J ,Risemberg R . Becoming a Self-Regulated Writer: A Social Cognitive Perspective[J]. Contemporary Educational Psychology, 1997, 22(1):73-101.
10. Chang Yongmei. The Support of Educational Information Environment for Students' independent Learning [J]. Study on Audio-visual Education, 2006 (12): 3.

Open Access This chapter is licensed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits any noncommercial use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

