Research on the Influence of Online Learning on Students' Desire to Learn

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Abstract: Due to the coronavirus pandemic, many students are learning online. Because of the particularities of the online environment, the different study habits of each student and the different teaching characteristics of instructors, the evaluation of online learning differs widely. This paper uses questionnaire to examine the situation of college students' online learning in China and abroad and the factors influencing their desire for online learning. The study found that the main factors affecting students' learning desire in the process of online learning are students' self-learning abilities, teachers' ICT literacy and hardware equipment conditions.

1. Introduction
Because the COVID-19 pandemic has caused schools around the world to close, tens of millions of students have had to study online at home. In China, the government has encouraged students to suspend classes without stopping studying and vigorously developed broadcast television networks and online education tools. At the same time, students and parents have actively cooperated in the development of online learning, making an effort to smooth the rollout of online teaching. During this period, Information and Communication Technology (ICT) began to be widely used in daily learning. ICT refers to a series of resources and tools for information creation, dissemination, storage and management, reflecting the integration of computers with communication technology (Meng, 2009). During the pandemic, ICT has carved out its place in the previous education landscape. Online learning, as an aspect of ICT, seeks to enable students to learn through mobiles and computers. The use of ICT is also a driving force in promotion learning activities, maintaining motivation and improving performance (Zhao, 2018; Ira Irzawati et al., 2020). Nevertheless, many news investigations have found that students have different opinions about whether online learning is really effective. This paper seeks to identify the factors that affect students' learning desire (learning interest and persistence) in the process of online learning. Through understanding the outcomes of this study, we can improve students' learning desire and help them learn online more effectively.

2. Literature Review
It is important to know whether students are interested in online learning, and whether they have enough willingness to persist in using ICT to learn online to constitute a learning desire. It is necessary to turn to previous research to examine the factors that influence learning desire, which comprises two essential elements: interest and persistence. These two elements will be examined respectively in the following sections.
2.1 Factors affecting interest in learning

Learning interest refers to the degree to which students like using online devices and online platforms for learning. It measures whether the learning content can effectively stimulate learners' strong desire for knowledge, helping them form a positive and active learning attitude, and fully participating in the learning process, all of which can help improve the learning efficiency of online courses (Zhang et al., 2008). Qian’s (2014) study on the influencing factors of online learning users' continuous use behavior finds that the correlation between "interest" and "satisfaction" is still significant when the significant condition is $P<0.001$.

Students' adaptability to the network environment is an important factor. Of the various types of interaction (e.g., between learners, between learners and teachers, and between learners and contents), the interactions between learners and learning contents, and learners and teachers are the most important in affecting online learning satisfaction. Beyond that, students’ self-efficacy is also related to learning satisfaction as it affects self-regulated learning ability in an online setting (Xu et al., 2017). In a word, the fundamental purpose of learning is student-centered. In their research on stimulating learners' interest in learning through the design of online courses, Zhang et al. (2018) point out that the following aspects stimulate learners' interest in learning: goal guidance, integration of resources, embedded games, highlighting personality, interactive communication, and multiple evaluation. The development of online courses aims to create a wider learning space for students, and the design of online courses needs to meet the needs of students. Understanding students' goals and being student-centered are important factors in stimulating students' interest in learning.

Research has also found that teachers' ICT literacy is a key external factor impacting students’ interest in learning. Research on the integration of teacher teaching and information technology is also developing. The Technological Pedagogical and Content Knowledge (TPACK) framework has been widely used in the design and evaluation of teachers’ professional development curricula (Chai et al., 2013). Improving teachers' technical level is very important for students' online learning experience. Chi’s (2015) research on the satisfaction associated with flipping classroom found that students are satisfied with the overall experience of online learning, but think that three aspects require improvement: the effectiveness of the teaching, the teaching process and teaching equipment. That is to say, the teaching aspect affects the students' satisfaction with online learning to some extent. Content and interaction with teachers also affect students' interest in online learning (Qian, 2014; Xu, 2017). Specifically, Zhao et al. (2010) have researched students' satisfaction and influencing factors in mixed learning environments, exploring four influencing factors: students' characteristics, teachers' characteristics, curriculum characteristics and system functions. Their research shows that factors involving teachers, including feedback on homework and timely responses to examinations, are important factors affecting students' satisfaction. A study by Zhu et al. (2017) also showed that emotional support plays a vital role in students' learning satisfaction. Teacher interaction and teaching resources are key factors for improving learners' satisfaction. Xu et al. (2018) examined students’ evaluation of the platform design and teaching design, and found that the students' overall satisfaction with online learning is high. However, certain problems were identified: the lack of vivid video, the tedious design of learning tasks, the lack of learning support for students, and the inadequate adaptation to online discussion. That is to say, the design of teaching content, the ICT ability of teachers, and the ICT ability of students have certain effects on students’ overall satisfaction. When studying the relationship between the APT teaching model (an evaluation-based teaching model integrating assessment, pedagogy and technology) and students' learning interest and achievement, it is very important to focus on the hardware being used, the ability of the teacher to operate the equipment, and the identification of the teacher with the concept of student-centeredness, which all play roles in promoting online teaching (Zhang et al., 2016). The use of information technology in the Internet era to integrate the advantages of traditional and online classes presents a teaching model that can help students achieve the best learning results. This requires a deep integration of information technology and higher education in terms of hardware. Because it can facilitate students to learn independently and make learning more effective, the
integration of ICT and education is generally quite popular with students. Meanwhile, students think that regardless of whether the equipment is perfect, students' adaptability to computer equipment, the suitability of the network environment and the learning effect of using ICT are the most important factors affecting their satisfaction with the lessons (Chen, 2018; He, 2014; Zhao et al., 2010).

Generally speaking, students' own ability, teachers' ICT literacy and the network environment affect students' interest and satisfaction, and ultimately the effectiveness of online learning for stimulating students' interest.

2.2 Factors affecting learning persistence
Learning persistence refers to students’ continuous investment in learning when they encounter difficulties, obstacles or extraneous stimuli. Learning persistence has an important influence on students' learning effect (Zhuang et al., 2016).

Shi (2009) has studied the correlation between self-monitoring, responsibility and learning persistence among college students using quantitative methods, finding that learning persistence has a significant relationship with self-monitoring and responsibility among college students. Strengthening the sense of responsibility in college students is helpful to the promotion of learning persistence and self-monitoring. In addition, online education users' evaluation and recognition of self-learning status, academic self-concept, and perceived satisfaction have significant correlations with learning persistence (Qian, 2014). University students’ study goals directly affect their study persistence, for academic motivation and learning strategies are important factors influencing their learning persistence (Zhu, 2005; Vanthournout et al., 2012).

Interaction and emotion are also important factors in students' learning persistence in online learning (Moore et al., 1996; Moore et al., 2002). Kemp (2002) has investigated the learning persistence of adult students in distance courses by using the elastic attitude scale Resiliency Attitudes Scale (RAS). The research shows that students' satisfaction with the courses, sense of belonging to the learning group, learning motivation, peer family support, self-time management, and communication with teachers all affect their online learning persistence. The research of Stanford-Bowers (2008) shows that situational barriers are the result of social, economic and personal changes in students' lives, including uncontrollable factors such as age, personality, time, family support and responsibility (Cross, 1981; Lorenzetti, 2004). Of these, personality factors are determined by the context of the individual, including their learning attitudes, motivation, learning methods and self-confidence (Cross, 1981). Learning motivation is an extremely important factor for all students. Online learning students need to have more persistence when they feel comfortable and satisfied with their learning experience in the social and academic environment of the university (Qian, 2014; Kemp, 2002; Tinto, 1993; Billups, 2008).

Beyond that, the content, communication between teachers and students, and the learning environment also have some influence on learning persistence. Students are more persistent when they feel comfortable and satisfied with their learning experience in the social and academic environment of the university (Qian, 2014; Kemp, 2002; Tinto, 1993; Billups, 2008).

Chen et al. (2014) conducted a case study using a group of students taking a MOOC course to explore learning persistence in the MOOC context. Based on their analysis of the MOOC platform, teachers and learners, the researchers found that the operation of the system, module setting and user interaction affect learning persistence. In terms of teachers, teaching behavior, teaching content and teaching management have an impact on students. In terms of learners themselves, self-regulation ability, cooperative interaction and learning state have a certain influence on persistence.

In short, the ICT literacy of students is an important factor in the development of online learning. Jiang et al. (2013) have analyzed the ability of learners to influence learning effect from the perspective of the learning motivations of MOOC learners. Of these, learners are required to be competent with information technology; have good English abilities; be capable of self-regulation; be adaptive learners; and have a strong self-learning ability. Meanwhile, the ability of teachers is also very important. Knowledge acquisition, participation in learning, and knowledge innovation constitute key elements. It
is very important to design a teaching system which focuses on teachers' ability and students' cognition (Lin et al., 2017). Only when the ICT is properly integrated into the teaching content and the teachers use the ICT properly, giving students can have the correct attitude and the ability to understand and use ICT, can a complete teaching ecosystem be formed. External conditions such as teachers’ and students’ ICT literacy can influence the effectiveness of ICT teaching (Meng, 2009).

3. Research design

3.1 Questionnaire design
This study uses a research questionnaire comprising six parts. The first part of the questionnaire asks for the basic background information of the participants: gender, school, grade, subject, location, family income and parents' education level (family cultural capital). The second part focuses on one of the independent variables of the online learning hardware situation survey, divided into the use of equipment and network fluency. The third part of the questionnaire is a survey of teachers’ ICT literacy, to use as independent variables. The investigative questions are borrowed from Jia’s (2018) Study on Effective Teaching Behavior in College English Hybrid Teaching, and then based on Bandura's triadicreciprocal determinism; Bandura (1986) proposes that there is a ternary interaction causality between human behavior cognitive factors and environment. Based on the “teacher factors” part of the questionnaire, this research is adapted to evaluate teachers’ ICT literacy from the perspective of students. The fourth part of the questionnaire is a survey of independent variable students’ self-learning ability. The questions come from Liu’s (2018) research on the influence and intervention of teaching interaction on college students' self-regulated online learning. Scholars have conducted studies using several common measuring tools and their findings provide two key ideas: one is based on the process of self-regulated learning; the other is based on the structural components and behavioral elements of self-regulated learning. Liu (2018) refers to the learning self-regulation scale of Pintrich (1999), the online learning self-regulation scale of Barnard et al. (2009) and the MOOC online learning self-regulation questionnaire of Kizilcec et al. (2017) to design and compile a questionnaire scale combining these two ideas. After supplementary modification, the scale contains 32 questions covering six aspects. The researcher has selected the “self-monitoring” part of Liu’s (2018) scale to measure students' self-learning ability level in online learning. The fifth part of the questionnaire looks at the study desire of the dependent variable students. It contains two aspects: one is learning interest and the other is learning persistence. Rotgans (2015) identified six indicators: cognitive engagement, curiosity, enjoyment, self-efficacy, attention and boredom. This research selects Rotgans’ (2015) Individual Interest Questionnaire to investigate students' interest in their subjects. The learning persistence test is derived from Duckworth’s (2009) Short Grit Scale (Grit-S), which has good reliability and validity, as Duckworth has ensured by testing it over a long period. This research uses a simple perseverance questionnaire to measure students' perseverance and persistence in learning. The sixth part of the questionnaire asks an open question, asking whether the participants have other opinions and suggestions on the research questions and questionnaire. The sources of each module are detailed in Table 1.

| Part I Q1-Q8 | Self designed |
| Part II Q9-Q10 | Self designed |
| Part III Q11-Q25 | Jia (2018) Study on Effective Teaching Behavior |
| Part IV Q26-Q34 | Liu (2018) Online Self-directed Learning Level Questionnaire |
| Part V Q35-Q49 | Q35-Q41: Rotgans (2015) Individual Interest Questionnaire (IQ) Q42-Q49: Duckworth (2009) Short Grit Scale (Grit-S) |
| Part VI Q50 | Self designed |
The questions in the questionnaire are measured using the Likert five-point scale, which requires participating students to answer according to their actual online learning situation. The five options from 1 to 5 represent strongly disagreed, disagree, uncertain, agree and strongly agree. The formal questionnaire was published through the website, Wenjuanxing, and college students from all over the world participated in this questionnaire, mainly from China (82.6%), some from other countries (17.4%, which mainly includes the United Kingdom, the United States, and Japan). A total of 75 questionnaires were collected, of which 69 were valid, with an effective rate of 92%. 42 of the respondents were women, accounting for 60.9%, and 27 were men, which accounts for 39.1%. Of these, 26 students (37.7%) were undergraduates, and 22 were master's students, making them the biggest group, accounting for 31.9%. Data analysis was performed using Stata/SE 15.0 software. The results were obtained through descriptive statistical analysis as shown in Table 2. Through descriptive statistical analysis, the average value of learning desire reached 52.20, indicating that overall, the students present moderate learning in the online learning process.

|                      | Model 1 Learning interest | Model 2 Learning persistence | Model 3 Learning desire |
|----------------------|----------------------------|------------------------------|-------------------------|
| Gender               | 69                         | 1.39                         | .49                     | 1                       | 2                       |
| School               | 69                         | 3.17                         | 1.31                    | 1                       | 5                       |
| Grade                | 69                         | 4.25                         | 1.70                    | 1                       | 7                       |
| Subject              | 69                         | 1.57                         | .83                     | 1                       | 4                       |
| Location             | 69                         | 1.23                         | .43                     | 1                       | 2                       |
| Family Income        | 69                         | 3.01                         | 1.65                    | 1                       | 9                       |
| Family cultural capital | 69                        | 4.29                         | 1.82                    | 2                       | 8                       |
| Hardware equipment   | 69                         | 7.52                         | 1.92                    | 2                       | 10                      |
| Teachers’ ICT literacy | 69                       | 51.43                        | 11.55                   | 15                      | 75                      |
| Students’ self-learning ability | 69           | 32.57                        | 7.28                    | 9                       | 45                      |
| Learning interest    | 69                         | 24.42                        | 5.87                    | 7                       | 35                      |
| Learning persistence | 69                         | 27.78                        | 6.83                    | 8                       | 40                      |
| Learning desire      | 69                         | 52.20                        | 12.20                   | 15                      | 75                      |
4. Research results

| Table 3. Analysis on Influencing Factors of Learning Interest, Learning Persistence and Learning Desire |
|---------------------------------------------------------------|
| Students' self-learning ability | .43*** (1.10) | .67*** (1.13) | 1.10*** (1.19) |
| Teachers’ ICT literacy | .10 (.057) | .09 (.061) | .19 (.11) |
| Hardware equipment | .45 (.30) | .01 (.32) | .45 (.56) |
| Gender (taking female as a reference) | 2.42* (1.03) | 1.84 (1.10) | 4.26* (1.91) |
| Subject (taking humanities & social sciences as a reference) | | | |
| - Science | .75 (1.30) | 1.12 (1.40) | 1.87 (2.43) |
| - Engineering | -.95 (1.34) | 1.12 (1.43) | .17 (2.48) |
| - Agriculture | -1.04 (4.12) | 2.52 (4.41) | 1.48 (7.64) |
| Grade | .05 (.29) | .21 (.314) | .26 (.54) |
| Location (taking city as a reference) | 1.50 (1.15) | .54 (1.23) | 2.05 (2.14) |

(Note: *p<0.05 **p<0.01 ***p<0.001)

As is shown in Table 3, Model 1 explores the influence of students' self-learning ability, teachers' ICT literacy and hardware devices on learning interest, controlling gender, subject, grade and location as independent variables. The research has found that students' self-learning ability can significantly promote their interest in learning (p<0.001). And there are differences in learning interest between different students in terms of gender.

Model 2 explores the influence of students' self-learning ability, teachers' ICT literacy and hardware equipment on learning persistence, controlling gender, subject, grade and location as independent variables. Study has found that students' self-learning ability can significantly promote the degree of persistence (p<0.001). The rest of the factors are not obvious.

Model 3 explores the influence of students' self-learning ability, teachers' ICT literacy and hardware equipment on learning desire in the context of controlling gender, subject, grade and location as independent variables. The research has found that students' self-learning ability can significantly promote learning desire (p<0.001), and there are also gender differences.

In general, the research has found that students' self-learning ability, teachers' ICT literacy and hardware equipment are significantly correlated with learning desire. However, when regression
analysis is carried out, it is found that students' self-learning ability can most significantly promote learning desire.

5. Discussion and significance

Generally speaking, students have strong desire to study in the process of online learning. Students' self-learning ability is the most important factor affecting students' desire for learning online. Students are able to control their learning progress, complete their learning tasks on time, recognize their problems in the learning process and correct them, be familiar with their learning situation and make adjustments at the right times, all of which are very important to one's self-learning ability. In Liu's (2018) research on students' self-learning ability, the author points out that if we can avoid being distracted by the outside world, not give up when we encounter difficulties, and spend time on the content of the course after the in-class learning, we can develop good self-learning ability. The related influence is presented in the impact of learning desire, which also helps to develop learning desire.

The research shows that there are differences in gender between students' online learning interest and learning desire. According to the analysis of the questionnaire data, males have higher learning interest and learning desire than females. In the university, there are differences between males and females in personality and emotional perception, and the study motivation and professional interest in professional courses are not the same. Males pay more attention to practice, and females pay more attention to hobbies. In the face of gender differences in learning, schools and teachers should pay attention to the characteristics of students and actively develop their professional interests, and at the same time change the gender concept and create a good learning environment (Chen, 2020).

Through literature review, it can be seen that teachers' ICT literacy has a certain influence on students' online learning desire. Teachers' online education levels and abilities are also very important in the quality of online courses. How teachers use ICT and their application of the TPACK theoretical framework has attracted much attention in teaching in the field of ICT and teaching integration (Cai et al., 2015). In the process of online teaching, teachers’ expertise, whether teachers can give students independent learning resources, whether they can pay attention to different levels of different students, whether they can track students’ learning, and whether they can actively guide students to speak and discuss online, etc. All have a great influence on students' learning attitude and desire.

The hardware equipment was seen in the literature review to have a certain influence on online learning interest, but we found that there is no significant correlation between hardware equipment and learning desire through the research. What equipment students use for online learning, whether the network environment is good and the design of the network teaching platform have certain influence on the students' learning (Jia, 2020). However, it has no significant effect on the students' learning desire.

Because of the pandemic, thousands of college students are unable to return to school normally, and the state and schools have organized them to study online instead. This large-scale online teaching has brought new learning methods to students, but also brought new challenges to schools and teachers. Through this study, we hope to give some suggestions to students, teachers and universities who are organizing online education because of the pandemic. Online learning focuses on developing students' self-learning ability and focuses on promoting students' learning desire, which is conducive to the positive progress of online learning and improving the learning effect. Beyond that, it is important to train teachers to improve their online teaching ability. Teachers influence the content of the curriculum and the progress of learning, and they are also very important in students' learning desire. Through literature research and quantitative research on college students in many countries and universities around the world, the research summarizes the factors that affect students' online learning desire and shows the importance of cultivating students' self-learning ability. During the pandemic, online learning has become mainstream, and it is particularly important to pay attention to developing students' good self-learning ability for the improvement of their learning desire.

References

[1] Bandura, A. (1986). Social Foundations of Thought and Action. Englewood Cliffs, NJ, 1986.
[2] Barnard, L., Lan, W. Y., To, Y. M., Paton, V. O., & Lai, S. L. (2009). Measuring Self-regulation in Online and Blended Learning Environments. The Internet and Higher Education, 12(1), 1-6.
[3] Billups, F. D. (2008). Measuring College Student Satisfaction: A Multi-year Study of the Factors Leading to Persistence.
[4] Brookfield, S. D. (1995). Becoming a Critically Reflective Teacher. San Francisco: Jossey Bass.
[5] Cai, J.X., & Deng F. (2015). Research on Technological Pedagogical Content Knowledge (TPACK): Progress and Trend. Modern Distance Education Research,(2015, 03), 9-18.
[6] Chai, C. S., Koh, J. H. L., & Tsai, C. C. (2013). A Review of Technological Pedagogical Content Knowledge. Journal of Educational Technology & Society, 16(2), 31-51.
[7] Chen, B.R. (2020). Research on Public English Teaching Strategies in Colleges and Universities from the Perspective of Gender Difference. The Guide of Science & Education, 400(02), 91-92.
[8] Chen, M., & Sang X.S. (2018). An Empirical Study on College Students' Cognition and Satisfaction of Mixed Teaching Mode Reform Curriculum. Modern Distance Education, 179(05), 57-64.
[9] Chen, X.D., & Cao A.Q. (2014). Why not Insist --- An Analysis of a MOOC Study Case. Modern Distance Education, 2, 9-14.
[10] Chi, Y. (2015). A Survey of Student Satisfaction in Flipping Lesson. Higher Education Exploration, (2015, 06), 85-89.
[11] Cross, P. (1981). Adults as Learners. San Francisco: Jossey Bass.
[12] Duckworth, A. L., & Quinn, P. D. (2009). Development and Validation of the Short Grit Scale (GRIT-S). Journal of Personality Assessment, 91(2), 166-174.
[13] He, G.D., & Zhong Z.Y. (2007). Study on the Adaptability of College English Teaching and Learning in Multimedia Technology Environment. Foreign Language World, 2(10).
[14] He, K.K. (2014). From the Essence of "Flipping Lessons", Look at the Future Development of "Flipping Classroom" in our Country(Doctoral dissertation).
[15] Irzawati, I., & Hasibuan, A. R. (2020, January). Students’ Perceptions of the Utilization of ICT in English Learning: Way or Barrier?. In 3rd International Conference on Innovative Research Across Disciplines (ICIRAD 2019) (pp. 68-73). Atlantis Press.
[16] Jia, X.H. (2020). Analysis of College Students' Online Learning in the Internet Age. Technology and Economic Guide, 28(07), 106-107.
[17] Jia, Z.X. (2019). Study on Effective Teaching Behavior in College English Hybrid Teaching (Doctoral dissertation, Shanghai International Studies University).
[18] Jiang, L., Han X.B., & Cheng J.G. (2013). Analysis and Research on MOOCs Learners’ Characteristics and Learning Effect. China Educational Technology, 11, 54-59.
[19] Kemp, W. C. (2002). Persistence of Adult Learners in Distance Education. The American Journal of Distance Education, 16(2), 65-81.
[20] Kizilcec, R. F., Pérez-Sanagustín, M., & Maldonado, J. J. (2017). Self-regulated Learning Strategies Predict Learner Behavior and Goal Attainment in Massive Open Online Courses. Computers & education, 104, 18-33.
[21] Lin, B.Y., Wu, H.P., Hong, G.C., Dong, Y., Cai J.X., & Hong, H.Y. (2017). Research on Teaching Design of Network Resources and Online Platform——Based on the Perspective of Learning Concept Changes. Journal of Open Learning, (6), 28-34.
[22] Liu, B. (2018). The Influence of Teaching Interaction on College Students' Online Self-regulated Learning and Its Intervention (Doctoral dissertation, Shaanxi Normal University).
[23] Lorenzetti, J. P. (2004, April). To Drop or not to drop: Findings from West Texas A&M University. Distance Education Report, 8(8). Retrieved on December 8, 2005, from Academic Search Premier database.
[24] Meng, Y.R. (2009). ICT Quality Influencing Factors of College Students in English Teaching Ecosystem. Computer-Assisted Foreign Language Education in China, 11, 30-36.
[25] Moore, K., Bartkovich, J., Fetzer, M., & Ison, S. (2002, June). Success in Cyberspace: Student Retention in Online Courses. Paper Presented at the Annual Forum for the Association for
Institutional Research, Toronto, Ontario, Canada. Retrieved on December 13, 2005, from the ERIC database. (ERIC Document Number ED472473)

[26] Moore, M. G., & Kearsley, G. (1996). Distance Education: A Systems View. Belmont, CA: Wadsworth.

[27] Pintrich, P. R. (1999). The Role of Motivation in Promoting and Sustaining Self-regulated Learning. International Journal of Educational Research, 31(6), 459-470.

[28] Qian, Y. (2014). Study on the Influence Factors of Online Learning Users' Continuous Use Behavior. Commercial Research, 56(12), 87-92.

[29] Rotgans, J. I. (2015). Validation Study of a General Subject-matter Interest Measure: The Individual Interest Questionnaire (IIQ). Health Professions Education, 1(1), 67-75.

[30] Shi, S.X. (2009). Research on the Correlation of Self-monitoring, Responsibility and Learning Persistence of College Students. Chongqing: Southwest University, 17.

[31] Stanford-Bowers, D. E. (2008). Persistence in Online Classes: A Study of Perceptions among Community College Stakeholders. Journal of Online Learning and Teaching, 4(1), 37-50.

[32] Tan, G.X., Xu, F., & Qu, W.J. (2012). Influencing Factors and Models of College Students' Network Teaching Behavior Intention. E-Education Research, 1, 47-53.

[33] Tinto, V. (1993). Leaving college: Rethinking the Causes and Cures of Student Attrition (2nd ed.). Chicago: University of Chicago.

[34] Vanthournout, G., Gijbels, D., Coertjens, L., Donche, V., & Van Petegem, P. (2012). Students' Persistence and Academic Success in a First-year Professional Bachelor Program: The Influence of Students' Learning Strategies and Academic Motivation. Education Research International, 2012.

[35] Xu, X.Q., Wei, B. (2018). Advanced English Online Learning and Evaluation Survey. Technology Enhanced Foreign Language Education. 184(06), 24-28+34.

[36] Xu, X.Q., Zhao, W., & Liu, H.X. (2017). The Influencing Factors of College Students' Online Learning Satisfaction. Distance Education in China, (5), 43-50.

[37] Zhao, G.D., & Yuan, S. (2010). Research on Student Satisfaction and Influencing Factors of Blended Learning——Taking Peking University Teaching Net as an Example. Distance Education in China, 6, 32-38.

[38] Zhao, S. (2018). Foreign Language Education Model in Spanish Universities Based on ICT. Foreign Languages in China, 05, 85-92.

[39] Zhao, W., Zhang, S.N., & Pei, X.J. (2012). Study on the Construction of Three-Institute Network Learning Evaluation System of "Motivation, Process and Effect" (Doctoral dissertation).

[40] Zhang, Q.X., Li, S.J., & Wang, Y.S.. (2008). Research on the Strategies of Learner's Interest in Learning in Network Curriculum Design. China Educational Technology, 8, 59-61.

[41] Zhang, Y., Bai, Q.Y., Li, X.Y., Zhu, Y.H., Fan, F.L., & Xie, L. (2016). A Study on the Influence of Mobile Learning on Students' Learning Interest and Achievement on APT Teaching Model -- Taking Primary Mathematics “Pie Diagram” as an Example. China Educational Technology, (2016, 01), 26-33.

[42] Zhu, L.F. (2006). A Study on the Relationship between Academic Self-concept, Achievement Goal Orientation and Learning Persistence of College Students. Chinese Journal of Clinical Psychology, 14(2), 192-193.

[43] Zhu, Y.F., & Li, X. (2017). A Review of Chinese Distance Learner Satisfaction Research for Quality Assurance. Distance Education in China, (7), 40-47.

[44] Zhuang, H.J., Liu, R.D., Liu, Y., Wang, J., Zhen, R., & Xu, L. (2016). The Influence of Social Support of Middle School Students on the Persistence of Mathematics Learning: Intermediation of Mathematics Self-efficacy. Psychological Development and Education, 32(3), 317-323.