

Effect Analysis and Optimization Path of College Students' MOOC Learning

-- A Case Study of Jiangsu University

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Abstract

In the Internet plus and post epidemic era, MOOC has been widely applied in the teaching field. This is obvious to people. But at the same time, a few problems have attracted the attention of all. Taking Jiangsu University as an example, this paper makes an inquiry from three aspects: students themselves, teachers' teaching and learning platform. The results show that learners' self-discipline ability, the limitations of MOOC platform, the practicability and timeliness of curriculum and the single repeatability of resources are all the plastic factors affecting the learning effects. Based on the above results, the author will try to put forward suggestions from the perspectives of learners, teachers and MOOC platform.

Keywords

College student; MOOC; Learning effects; Optimization path.

1. Introduction

Massive Open Online Courses. The first MOOC began in 2011, when a professor at an American University uploaded an artificial intelligence course to the Internet, attracting students from about 200 countries. In 2012, leading universities in the United States began offering a variety of online learning platforms, offering many courses for free. With the advent of Coursera, Udacity and edX, three major open online courses, more and more students are experiencing the interest of online learning and the importance of autonomous learning. In May 2014, ICOURSE and cloud classroom, an online education platform owned by Netease, launched the national quality open course: A MOOC in Chinese universities. Since then, some universities in China have joined this platform to carry out the teaching construction and application practice of MOOC courses. Jiangsu University, a century-old well-known University with a long history of running schools and a profound cultural foundation, has also followed the times and set up an online open course for universities in 2015, launched a boutique online open course in 2017(Jiangsu University China University MOOC) .While continuing to promote the cooperation with the Higher Education Press, the university has also been actively conducting training and exchange seminars to promote the teaching reform practice based on MOOC/SPOC courses. In addition, schools are also focusing on the integration of traditional offline classes and online MOOC learning in order to more effectively promote student learning and improve student learning outcomes.

2. A Review of Research at Home and Abroad

2.1. An analysis of the Learning Effects of MOOC in Foreign Countries

Foreign Studies on the effectiveness of MOOC are mainly led by American scholars, which originated from the MOOC effectiveness report issued by Harvard University and MIT in 2015.

After several years of innovation and development, its research contents, methods and characteristics are also constantly enriched. At present, the research focuses on the following three aspects: First, a systematic overview of the university students MOOC learning effects, it involves the analysis of the reasons that affect the learning effects of MOOC and the theoretical investigation of improving the learning effects of MOOC; secondly, it pays attention to the combination of theory and demonstration in the research method, so that the research on the learning effects of MOOC of university students is more objective; thirdly, in terms of research characteristics, it is important to pay attention to the difference of MOOC teaching and individualized guidance to improve the effects of MOOC learning. In addition, behaviorism MOOC and connectionism MOOC are two common research paradigms in foreign countries. At present, foreign scholars generally focus on studying the effects of connectionism MOOC on college students' MOOC learning, on this basis, more attention is paid to the relationship between the timeliness of MOOC and the learning effects of MOOC.

2.2. An Analysis of the Learning Effects of MOOC in China

At present, the research on MOOC learning effectiveness of college students in China is still in the stage of exploration and development, and has not formed a complete system of MOOC learning validity. As far as the publication of the paper is concerned, there are several phenomena. First, the research on interdisciplinary teaching is rare. Most researchers focus on the field of educational theory and management. Only a few researchers have noticed the effects of the integration of Education and Social Sciences, electronic information and communication engineering on MOOC learning. Second, the teaching of mixed exploration is relatively less. Focus on the application of information technology in primary and secondary schools. In the resource integration, teaching mode, self-study, expansion and extension of the university students to optimize the MOOC learning effects are still relatively inadequate. Thirdly, the macro-policy, cultural value, teacher's quality and teaching ability have little influence on the effect analysis of MOOC learning. Fourth, looking at all kinds of literature, the construction of the practical research is insufficient, the analysis of the theoretical research is in the majority, and the research of the combination of theory and practice is lacking. As far as the effects of MOOC learning is concerned, the research shows the following trends: First, the integration of multi-fields and cross-disciplines. Second, under the different discipline angle of view to the MOOC learner's effect analysis and the MOOC platform system optimization path research. Thirdly, from qualitative and quantitative research design to hybrid design research tilt. Fourth, the use of meta-analysis and meta-comprehensive statistical methods to analyze the impacts of MOOC learning effects of college students. Fifthly, the construction of learner-centered MOOC teaching ecology plays an important role in optimizing the effects of MOOC learning.

3. Research Ideas and Methods

The study used a self-designed questionnaire to conduct an online survey among students of different grades and majors in Jiangsu University. A total of 210 online questionnaires were collected, of which 204 were valid, with an effective rate of 97.14%.

Table 1. Basic information of the study subjects

Title\Option	Variable	Number of persons	effective percentage (%)
Grade	Freshman Year of College	67	32.84%
	Sophomore Year of College	83	40.69%
	Senior Year of College	54	26.47%
Disciplines	Science and Engineering	118	57.84%
	Humanities and Social Sciences	86	42.16%

4. An Analysis of MOOC Learning Effects of Jiangsu University Students—Three-Dimensional Teaching Goals

4.1. Knowledge and Skills

The results showed that students did not see MOOC learning as having a significant impact on their knowledge and skills. According to the table below, about 50 percent of students agree that MOOC learning has a positive impact on improving their knowledge and skills, about 40 percent of students reported that MOOC learning had a modest impact on improving their professional skills, understanding and applying knowledge, and improving their ability to think for themselves.

Table 2. Effects of students using MOOC to learn knowledge and skills

Title\Option	Totally agree	Agree	Just so-so	Don't think so	Don't agree at all
You've upgraded your professional practice skills	41(20.1%)	67(32.84%)	77(37.75%)	12(5.88%)	7(3.43%)
You have a better grasp of knowledge	40(19.61%)	71(34.8%)	77(37.75%)	10(4.9%)	6(2.94%)
Your memory of knowledge lasts longer	36(17.65%)	56(27.45%)	88(43.14%)	18(8.82%)	6(2.94%)
You have the flexibility to connect and apply knowledge	34(16.67%)	68(33.33%)	82(40.2%)	14(6.86%)	6(2.94%)
You develop the ability to think independently and deeply	35(17.16%)	72(35.29%)	78(38.24%)	13(6.37%)	6(2.94%)

4.2. Processes and Methods

According to the chart below, about 40 percent of students believe that they can listen to their teachers carefully when they take a MOOC, and that they can take the initiative to complete their assigned tasks in a timely manner. However, many students believe that MOOC learning is not significant in setting learning goals, actively cooperating with teachers, participating in teacher-student Interaction, group exploration and collaboration.

Table 3. The roles of MOOC learning in learning processes and methods

Title\Option	Totally agree	Agree	Just so-so	Don't think so	Don't agree at all
You're better able to set goals	37(18.14%)	71(34.8%)	81(39.71%)	9(4.41%)	6(2.94%)
You can take the initiative to learn and listen carefully	40(19.61%)	74(36.27%)	67(32.84%)	17(8.33%)	6(2.94%)
You can actively cooperate with the teacher to participate in the interaction	32(15.69%)	65(31.86%)	84(41.18%)	18(8.82%)	5(2.45%)
You can seriously complete the task assigned by the teacher	40(19.61%)	85(41.67%)	59(28.92%)	12(5.88%)	8(3.92%)
You can actively participate in group discussions and cooperation	32(15.69%)	69(33.82%)	80(39.22%)	15(7.35%)	8(3.92%)

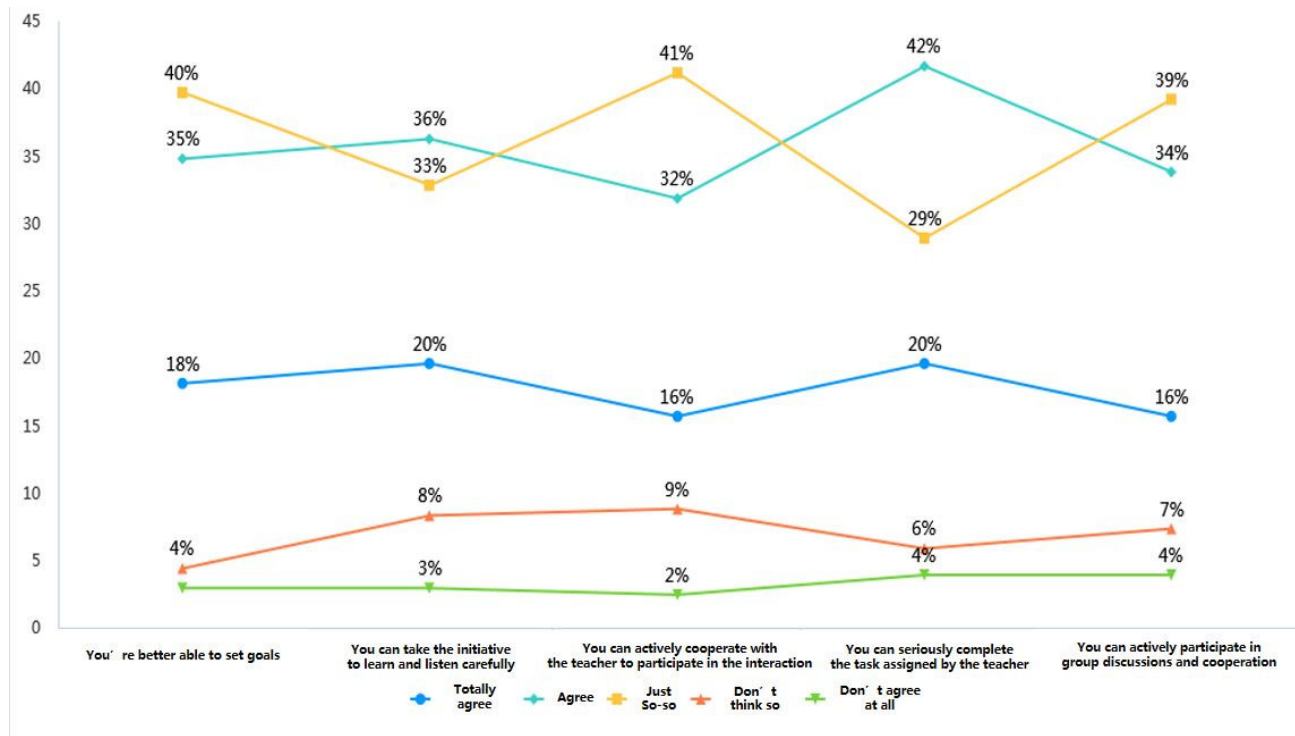


Figure 1. The roles of MOOC learning in learning processes and methods

4.3. Emotions, Attitudes and Values

About 40 percent of students say they are motivated, organized, and happy to learn a MOOC. In the face of difficulties, can face up to the problems, reasonable analysis of its causes, timely find help to eliminate difficulties, can also face up to the academic achievements, correct self-adjustment, persevering. But in a MOOC, students see themselves as less resistant to disruption.

Table 4. The impacts of MOOC learning on students emotional attitudes and values

Title\Option	Totally agree	Agree	Just so-so	Don't think so	Don't agree at all
You can learn on your own and in a planned way	35(17.16%)	85(41.67%)	68(33.33%)	10(4.9%)	6(2.94%)
You can experience the learning process in a more pleasant way	38(18.63%)	81(39.71%)	67(32.84%)	11(5.39%)	7(3.43%)
You are in a better position to ask for help and get out of trouble	34(16.67%)	78(38.24%)	69(33.82%)	17(8.33%)	6(2.94%)
You can look yourself in the eye, adjust to it, and keep trying	33(16.18%)	80(39.22%)	76(37.25%)	10(4.9%)	5(2.45%)
You can resist the distractions and temptations of the learning process	29(14.22%)	62(30.39%)	89(43.63%)	16(7.84%)	8(3.92%)
You can treat the academic record correctly, and analysis the reasons wisely	33(16.18%)	74(36.27%)	74(36.27%)	17(8.33%)	6(2.94%)

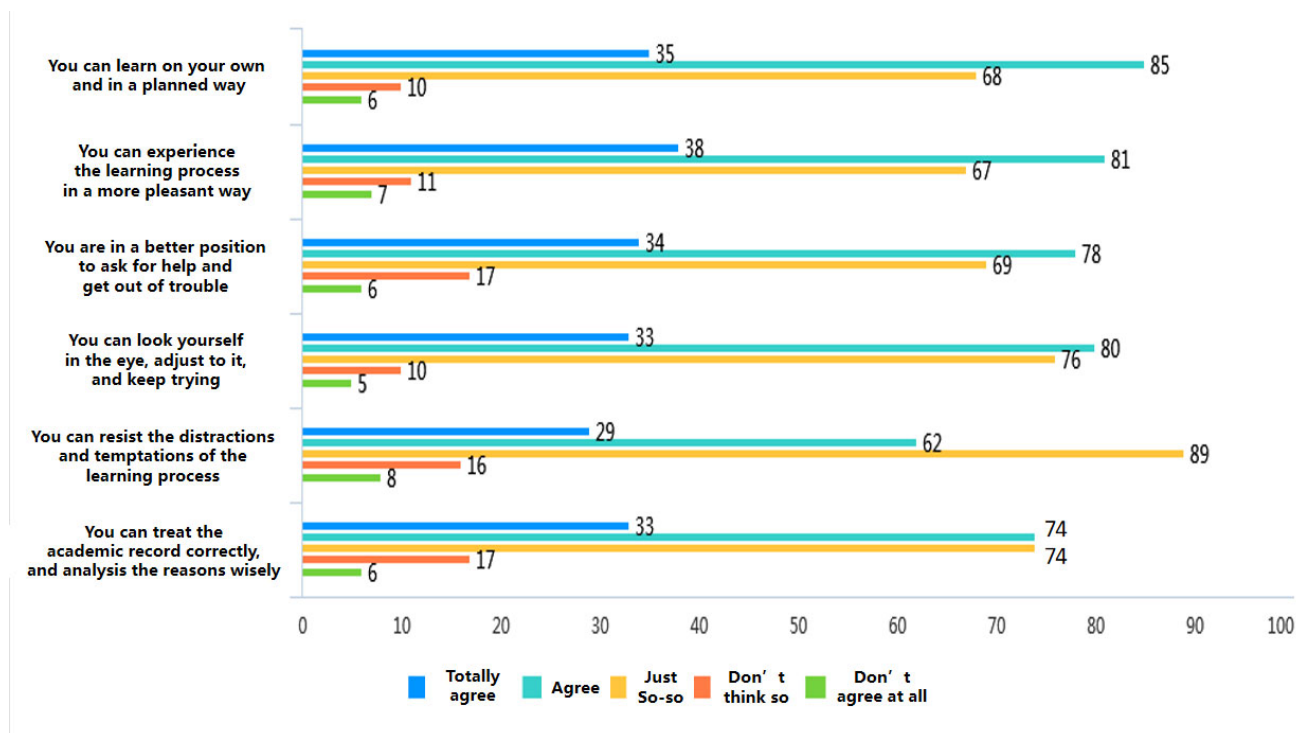


Figure 2. MOOC learning's impacts on students' emotional attitudes and values

5. An Analysis of the Factors Influencing the Effects of MOOC Learning

5.1. There Are Many Homogeneous Resources in the Platform, but the Utilization Ratio Is Low

The MOOC platform is characterized by large-scale, open resources and comprehensive courses. As far as the online courses available on the platform are concerned, there are more homogeneous resources and they are concentrated on the basic courses and professional public courses, such as English test band 4 and 6, Computer Test 2, teacher certification examination and other related courses, while the subject of the required and elective course resources are relatively scarce. Although there are many course resources with the same platform, the utilization ratio of some courses is low, for example, some courses only have more than 10 participants. Students may only choose to watch a large number of relevant courses for learning, but have not tried to learn other courses, considering the suitability of the relevant courses for their own learning. Watching a large number of courses may not be in line with the actual situation of their own learning, which may lead to polarization of the platform's homogeneous resources, easy to form the "Resource island" phenomenon, resulting in the platform has a low utilization of online course resources. At the same time, if students can not find a course that suits their study, it will lead to the students' lack of experience, low satisfaction, and then affect the learning effects.

5.2. The Course Examination Method Is Unitary, Studies for the Task

Some courses are graded based solely on the completion of online platform assignments and are rated by the general public. Although the grading standards have been given, each rater's understanding of the problem varies, and some raters have malicious grading and random grading, which to some extent also leads to the unfairness and inaccuracy of the grading, affect the ranking of the students' courses GPA, is not conducive to the evaluation of students. And some of the problems in the discussion board follow the phenomenon, the exchange of a single theme, the answer is also the same, is not conducive to promoting the development of independent thinking ability of students. It is difficult to ensure the truthfulness of the

students' answers and the fairness of the results, which makes some students pay less attention to the study of the course, students can really learn less course knowledge, there is a phenomenon of learning to complete the task, learning effects are reduced.

Table 5. Student evaluations of MOOC related functions

Title\Option	Totally agree	Agree	Just so-so	Don't think so	Don't agree at all
The curriculum is rich in resources and free of choice	4.41%	0.49%	21.08%	38.73%	35.29%
The interface navigation function is great and the operation is convenient	3.43%	1.96%	25.98%	43.63%	25.00%
To meet your personalized learning needs	4.42%	2.94%	25.98%	38.24%	28.43%
Can facilitate communication between teachers and students	5.39%	8.82%	38.24%	27.94%	19.61%
The practicality and timeliness of the course are strong	4.90%	3.43%	33.33%	36.76%	21.57%
The video interface is beautiful, smooth and clear	3.43%	3.92%	26.96%	40.69%	25.00%
Subtotal	4.33%	3.59%	28.59%	37.67%	25.82%

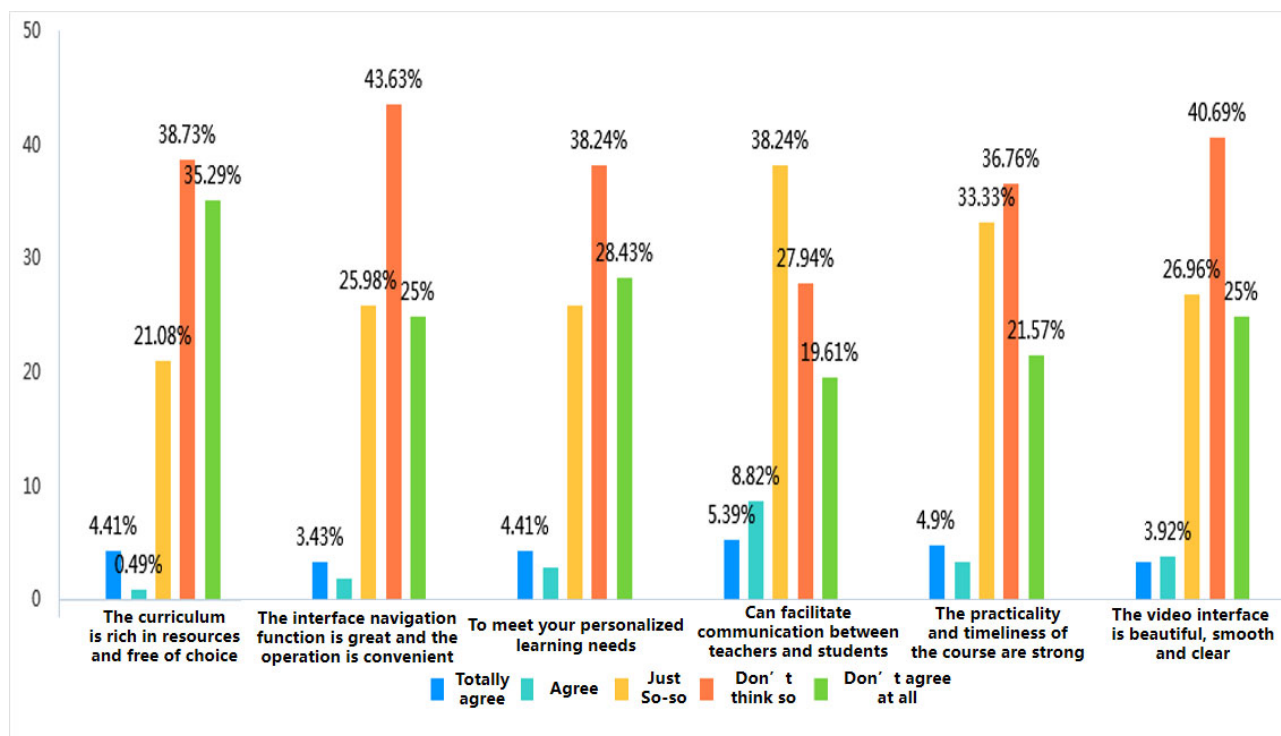


Figure 3. Student evaluations of MOOC related functions

5.3. The Students' Subjective Initiative of Self-study Is Low

Students lack purpose, initiative and persistence when they take a MOOC. Teachers set courses, assignments and exams in order to accomplish the school's mandated tasks, and students study for the required credits without purpose. As a supplement to the school's offline courses, college students have less time to study MOOCs, and their study time is fragmented, especially for students majoring in science and engineering. Some students are not well positioned for

self-recognition and development, are not clear about their academic career, career and career planning, and fail to perfect their own development in various aspects in the process of setting, aligning, reaching and creating standards, this is an important reason that leads to the lack of purpose, initiative and persistence in learning. Some students are too busy with the work of association and social practice to pay attention to the development of their studies, and fail to balance their studies, work and social practice. In the absence of supervision by teachers and peers, students' personal initiative, inertia, learning motivation and strategy, interest and style, learning attitude also affect students' learning effects.

Table 6. Students' evaluations of self-study

Title\Option	Don't agree at all	Don't think so	Just so-so	Agree	Totally agree
Have strong motivation to learn	8	8	86	70	32
Master certain learning methods	6	9	76	81	32
Have high interest and emotion in learning	5	13	82	72	32
Foster great learning attitude and habits	5	11	76	80	32
Gradually increase the confidence of learning	6	11	78	71	38
Subtotal	30	52	398	374	166

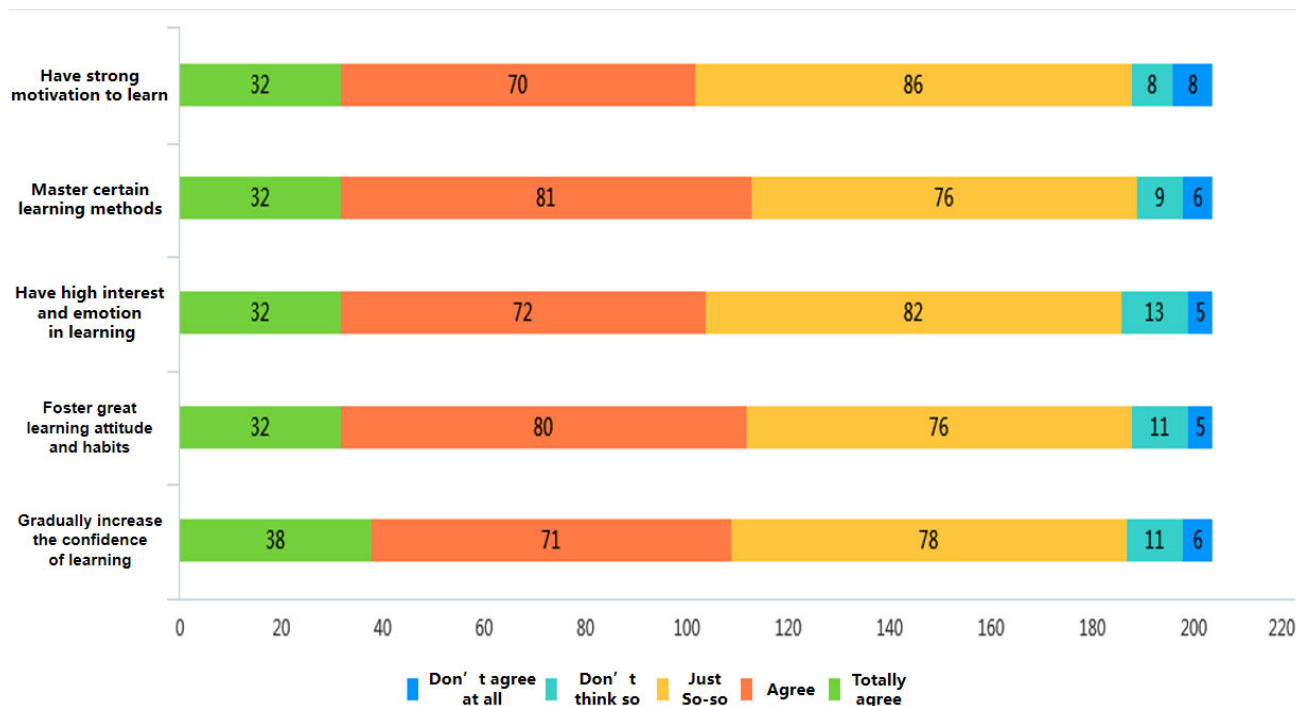


Figure 4. Relative evaluations of students' self-study effects

5.4. Lack of Teacher-student Interaction and Student-student Interaction

MOOC learning resources are generally of the following categories: Course Videos (both documents, PDF or PPT), homework quizzes, unit tests, Discussion Forum Q & a platforms, and so on. The MOOC video is recorded in advance and then uploaded to the MOOC platform after editing, so that students can review and learn new knowledge according to their own learning

needs, to some extent, this helps to improve the autonomous learning ability of some students, but teachers can not have effective real-time two-way interaction with students and students, which affects the quality of teaching to a certain extent, it's not good for students to work in a team. In addition, the course resources that the MOOC platform pushes out generally have the relatively complete course design, the data classification, the video recording, the course communication correlation system, therefore requests the teacher team that provides the course resources to pay the corresponding energy. It is difficult for the teachers who still need to complete the tasks of scientific research and administrative affairs stipulated by the school to take into account the construction and check of each link of the online course, and to realize the close interaction with students.

6. Optimization of MOOC Learning Effects for College Students

6.1. Strengthen the Ideological Construction of Students and Guide Them to Study Independently

Students should learn to learn on their own, how to seek knowledge in the process, and how to reflect on problems. College teachers should correctly guide students to develop metacognitive ability in reflective learning and improve the level of self-monitoring of learning. There are a lot of terms for autonomous learning¹, such as "Active Learning", "Autonomous Learning", "Self-Educated Learning"(SEL) , "Self-Directed Learning"(SDL) , "Self-Planned Learning"(SPL) , "Self-Managed Learning"(SML) , "Self-Supervised Learning"(SSL) and "Self-Regulated Learning"(SRL) . These theoretical terms define the concept of autonomous learning from the following nine dimensions: learning motivation and content, learning method and time, learning process and result, learning behavior, learning material environment and learning sociality. Teachers in colleges and universities should conduct classified guidance according to the characteristics of students of different grades², so that some students can change their inherent learning concepts, set up the concept of life-long learning, and improve their learning effects by using the above-mentioned active learning methods, and do a good job in time career, career, career planning for the future development of energy storage.

6.2. Attach Importance to Situational Teaching and Develop Individualized Learning

According to the theory of situated learning, students can not solve the problem only by extracting the existing knowledge, but need to reconstruct and reorganize the existing knowledge according to specific problems. The highly subjective and situational nature of knowledge determines that learning is a life-long activity, which requires students to be good at questioning, testing and criticizing knowledge. Therefore, it also requires teachers to pay attention to the construction of learning situation when teaching MOOC, and further requires students to base on the formed learning situation, using learning analysis technology, self-adaptive technology (the intelligent self-adaptive engine of MOOC learning platform) to improve the self-adaptive learning system, in order to promote and achieve students' personalized learning. In this process, we adjust constantly according to the matching degree between the learning goal and the learner's own ability³, to form correct self-efficacy judgment, stimulate learning motivation and improve students' self-efficacy (BANDURA's "Efficacy expectation"), in order to improve learning performance.

6.3. Improve the Platform Communication Mechanism, Increase the Communication Channels Between Teachers And Students

In order to deepen the communication between teachers and students, it is necessary to consolidate the interactive platform and improve the communication mechanism of the platform in order to achieve the goal of standardized interaction and efficient communication.

For example, the discussion area administrator can set the corresponding topic post according to the discussion topic's popularity, let the student participate in the discussion and study in the corresponding module topic. The communication between teachers and students is conducive to the construction of a harmonious and good relationship between teachers and students, to the promotion of teachers'ethics and teachers'ethos, to the reflection and evaluation of teaching and learning by both teachers and students, and to the improvement of students'interest in learning, also has certain promotion influence to the students'study effects. At the same time, increasing communication channels between teachers and students by setting up group chats on Qq, Wechat and other commonly used interactive software, such as displaying QR codes such as Qq and Wechat at the end of MOOC videos, or posting announcements on course discussion boards, informing QQ and other interactive software group number. In this way, even if the teacher can not reply the message in time because of the daily teaching, Scientific Research, administrative work and so on, other students can communicate and solve the problem of insufficient interaction through group chatting. In addition, according to the students'feedback expectations, some learning AIDS should be added, such as question-and-answer assistants, real-time marking of homework, and news push of professional research4.

7. Conclusion

In the context of the continuous development of MOOC era, it is particularly important to actively promote the application of information technology in education and teaching practice, effectively play the positive impact of information technology on the development of education, and discuss how to improve students' independent learning ability and MOOC learning effects. The improvement of learning effects should be based on the improvement of learners' internal driving force, supplemented by effective teaching means and hardware facilities and constantly improved, so that MOOC learning of college students can effectively serve the majority of students and effectively improve their learning effects.

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