How Behaviorism Can Help Provide Insight into MOOCs in the Chinese Education Market

Jiangye Zhu*

Xi'an Eurasia University, Xi'an 710065, Shaanxi Province, China

*Corresponding author: Jiangye Zhu, zhujiangye@eurasia.edu

Abstract: In recent years, online education has grown rapidly and expanded globally. As an undergraduate student, the author took part in massive open online courses (MOOCs) as an elective. While enjoying the convenience of high-tech distance education, the author also became aware of its shortcomings. For instance, when students are confused about a certain topic, they are unable to clarify with their instructors in real time since most of the time, recorded instructional videos are used. Students also tend to listen passively during lessons, indicating that they may not absorb information or "positively reinforce" what they know or have learned. When discussing the characteristics of MOOCs, the author hopes to demonstrate how online education may influence traditional teaching and serves as an excellent complement to conventional classrooms.

Keywords: MOOCs; High-tech distance education; Conventional classroom

1. Introduction

Through the study of behaviorism theory, some of the core ideas of behaviorism can be used to promote online education. These can be reflected in the five main stages of behaviorism: observation, imitation, repetition, reinforcement, and acquisition. This article mainly deals with two research concepts of behaviorism, which include "stimulus and response" as well as "positive reinforcement." This article first describes the background of the rapid development of massive open online courses (MOOCs) in Chinese universities and discusses the author's learning experiences in elective MOOCs during his undergraduate studies, in order to link the "immediacy" of online education with behaviorism. The second part of this article introduces readers to the main ideas of behaviorism and how it contributes to our understanding of the learning process. The last part of this article includes the application and suggestions of the behaviorist learning theory and teaching principles that Skinner proposed as a method to improve MOOCs.

2. The author's learning experience with MOOCs during undergraduate studies

In 2008, several Canadian professors, including Stephen Downes and George Simens, were the first to propose the concept of MOOC [1]. MOOC expanded online course offerings and provided greater access to a range of colleges and universities. By 2012, Stanford University, Harvard University, Massachusetts Institute of Technology, and other higher learning institutions had launched online course platforms. Course hosting platforms represented by edX, Coursera, and Udacity appeared one after another [2,3] and are rapidly spreading across the world. In 2013, Tsinghua University officially launched China's first MOOC. As of April 2017, China's four major MOOC platforms are covering 11 different disciplines, excluding military science, with a total of 3,039 courses being offered [4].

According to the Chinese College English Curriculum Requirements [5], China's education market still adheres to the "achievement-based model" although government departments and educational personnel are aware of the importance of comprehensive development and have begun to call and implement a series of measures to improve the existing education environment. From the author's experience, the goal of local education in China from age 5–12 until the period before stepping into university is to pass the college entrance examination. Therefore, students tend to rely on teachers in their daily learning practices rather than developing their ability to learn independently. In this section, the author will share his learning experience of an elective English writing course offered on a MOOC platform during his undergraduate studies in a Chinese university.

In order to develop better study habits and enhance his independent learning ability, the author took an elective English writing course on a MOOC platform during his undergraduate studies. The course has 12 separate videos, and students are required to watch and complete the exercises as well as the final exams during the semester to obtain credits. All the videos have the fast forward, pause, and rewind functions. Students can review the knowledge points that they are not familiar with and pause the video while taking notes. In that way, there is no need for students to be concerned about keeping up with the teacher's pace. The duration of each video ranges from 45–50 minutes. During the video, teacher-student interaction is occasionally interspersed, similarly to traditional classrooms. It is mainly divided into two forms of interaction: (1) the first type comes from the questions posed by the teacher in the video; due to the lack of timely feedback from the teacher, the author and other students from the same class tend to disregard these questions; (2) the second type of interaction comes from the automatic pop-up test questions that appear when the video is playing. Generally, the writing class focuses on fill-in-the-blanks and multiple-choice questions to test new knowledge points. These simple brainstorming and mouse operations reflect the limitations of the platform in testing students' learning. Upon receiving the "correct answer" response, students gain a sense of satisfaction and feel empowered in their learning. After the end of each video, the students participating in the English writing class can access the comment board, which will appear on the screen below. It provides students with the opportunity to ask the teacher questions directly and offers a platform for peer communication.

The advantage of multimedia is that it is not limited by time and space. The author once asked about the usage of attributive clauses on the comment board. A classmate from another school answered this question very promptly and enthusiastically. Her friendly behavior inspired the author's enthusiasm for resource sharing. However, because the "comments" interaction is not included in the final assessment, it is challenging to guarantee learners' participation during online courses. At the end of the semester, the final grade of the English writing course is entirely based on the final essay. Due to the particularity of online education, factors such as attendance rate and students' performance that should be considered in the traditional sense are not being reflected in the final grade. Online teaching platforms, such as MOOCs, help students develop their independent learning ability and improve their time flexibility. However, they do not have the capacity to respond positively to students' learning behavior, and the drawbacks that interfere with the learning behavior are also exposed.

3. Overview of Skinner's behaviorism theory
3.1. Main ideas of the behaviorist learning theory
At the beginning of the 20th century, the behaviorist learning theory began to develop in the field of linguistics, and it has become one of the leading schools of applied linguistics [6]. Based on a series of closely controlled animal and human experimental studies, numerous learning principles and laws have been discovered and proposed [7]. The behaviorist learning theory views learning as a "connection" behavior between the external stimulus, which is received by the individual, and their internal response. It is also a

connection process between new superficial knowledge and learner's internal knowledge network. These scholars believe that everyone's learning behavior is an individual's response to external environmental stimuli (learning materials), and acquisition is a natural response of the human brain after learning new knowledge from the outside world. They regard the acquisition of new knowledge as a stimulus brought by the external environment and consider individual behavior following the stimulation as a response. All the personal actions in the new knowledge environment are acquired. Therefore, even if the external environment is the same (the stimuli received), the responses (transition process and learning results) of different individuals will not be similar. A non-native language acquisition process can be regarded as an "operant" process that accepts stimuli continuously and uninterruptedly as well as responds as expected; that is the process of being stimulated, acting, obtaining results, or achieving goals. If the creation of this process is satisfactory, the language learner will choose to repeat this process; at this time, the "positive response" gets "reinforced." When this process is used in teaching, repeating the operation to obtain a positive response, which can ultimately achieve the target result, is termed "positive reinforcement" in behavioral learning theory.

American psychologist John Broadus Watson established the behaviorist learning theory in the early 20th century. Influenced by the work of Edwin Guthrie, Edward Thorndike, and Burrhus Frederic Skinner, the behaviorist learning theory has been dominant in the United States for more than half a century. Skinner pushed the boundaries of behavioral learning theory in his research and made a significant contribution to this field. He put forward the principle of operant conditioning and conducted a systematic study on the principle of reinforcement. The teaching mechanism and teaching program designed by Skinner based on the principle of operant conditioning had enormous global influence.

3.2. The practice of behaviorist learning theory in teaching

In language teaching, the behaviorist learning theory may be succinctly summed up as having five key development stages: observation, imitation, repetition, reinforcement, and acquisition [8]. The specific manifestation of "observation" is in the teaching materials and classroom behaviors. "Imitation" refers to repeating "effective" positive actions. According to Liu Lihong [9], reinforcement must be positive and optimistic in the process of language learning, and positive "reinforcement" is the key to "acquisition"; negative reinforcement means that accusations and criticisms cannot achieve their "acquisition" purpose.

According to the "stimulus-response" concept of the behaviorist learning theory, students should create one or more opportunities to provide external stimuli to promote learning responses. Therefore, in actual teaching practice, in addition to arranging opportunities to promote learning, "immediate" feedback is also an influencing factor that improves teaching effects. Teachers provide timely input following students' response to external teaching stimuli. This response and evaluation will strengthen students' response actions positively. The language learning experience in universities embodies the behavioral learning theory. Students are provided with a learning environment surrounded by foreign languages and objects that can be imitated and observed, and they are obliged to repeat these "imitations" and perform fittingly as an affirmation of their learning behavior [10]. The timeliness of this kind of affirmation has also primarily affected students' learning outcomes.

4. Applying Skinner's programmed instruction to curriculum improvement

The behavioral learning theory believes that learning is a purposeful and strategic activity. Using the "stimulus-response" and "positive reinforcement" concepts can effectively bring out the features of online education, with special attention given to the "immediateness" of MOOCs' curriculum design. Skinner designed his programmed instruction by dividing the teaching materials into fragmented learning units, from simple to complex. This approach encourages students to learn at their own pace and level while

providing individualized teaching materials (arranged in a specific order and in small steps). Starting from these principles and putting forward suggestions on MOOC curriculum reform will be conducive to improving students' online learning outcomes.

4.1. Improve curriculum design through the small steps principle

The small steps principle is the main principle for writing programmatic textbooks as proposed by American psychologist BF Skinner. It calls for compartmentalizing students' learning goals into many incremental steps. Students will achieve their ultimate goals by completing a series of small steps. The purpose is to control students' learning process and allow them to respond in time to reduce mistakes [7]. Teachers can divide the learning content into hierarchical course units according to the teaching goals and the course's inherent logic. Learners can follow the principle of gradual learning progress and gradually transition from straightforward content to tasks that require deeper thinking. The division process is not detailed or prescriptive. It should be decided according to the teaching contents, teaching tasks, and learners' levels. In online courses such as MOOCs, most of the course units are presented by teachers through videos. Generally, a class will not exceed half an hour. The course will break down each knowledge point according to the content's logical relationship with the rest of the curriculum. Past lessons are reviewed, and upcoming topics are foreshadowed, conferring a sense of cohesion to the overall course content.

Each step must be taught in order, building upon knowledge gained in the previous step [11]. Usually, at the end of the video, the key and challenging questions are presented to the students, and the answers will be provided just in time for them to move on to the next stage. As there is little difference in the video's difficulty before and after the course (according to its internal logical arrangement), it is easier for students to succeed in learning these small increments, thereby building their self-confidence [9].

4.2. Improve curriculum design through the principle of immediate response

Timely feedback refers to the timely notification of the action's result to the actors through a specific form. Adopting appropriate reinforcement methods as soon as the behavior occurs achieves the best incentive effect [12]. Following an action, even a simple feedback may reinforce it. Therefore, students' correct responses should be affirmed and encouraged in various ways in the teaching process. The improvement of MOOC in the context of behaviorism should also focus on "instant response" [13].

In the teaching practice, Skinner's operant conditioned reflex points out that when learners respond to external stimuli, they need to know as soon as possible if their response is correct and whether their behavior merits repeated reinforcement. Many MOOC videos will have fragmented quizzes to encourage students to review the knowledge they have learned at any time, check their understanding, and enhance their knowledge of the course's content. This frequent, light-touch mode of reviewing will improve the quality of learning and detect problems at an early stage. After the end of the video, the supporting after-school exercises play a role of "striking while the iron is hot." By allowing students to participate in self-test, the system enables students to know at once if their understanding is correct through system correction. "Instant reinforcement and confirmation" on learning behaviors, which is an effective measure to establish self-confidence in learning, not only helps students "review the past and learn the new" as well as strengthen and consolidate good learning behaviors, but also provides instructors a good sense of students' knowledge level.

4.3. Improve curriculum design through self-paced principles

Compared with traditional classroom teaching, online learning has several advantages. In a classroom environment, it is impossible to implement personalized tutoring according to students' individuality and differences, as all students are given group instruction in one style. Online courses allow students to decide

their own pace of learning, allowing and encouraging learners to take up courses according to their educational background, prior knowledge, and learning pace. It returns learning autonomy to students, so that they can adjust and control their own learning experiences, while taking into consideration of their learning efficiency and knowledge reserve. In traditional Chinese classrooms, a class's overall teaching progress is consistent due to the limitations of time and space. For broad interests, students cannot request to change the teaching progress according to their circumstances and preferences. Due to the affordances of its online platform, MOOC has inherent technological advantages. Students can "pause" and "fast forward" at any time during the lesson can replay the "micro-course" as needed. This feature enables students who have faster absorptive capacity and higher learning efficiency to engage in the next stage of learning at a faster rate; students will not forget the materials due to time delays or experience fatigued and lose enthusiasm with prolonged learning. Students with weak foundation or have difficulty mastering new knowledge can flexibly arrange their learning time, review unfamiliar sections at any time, and efficiently and selectively play these videos as needed. The return of learning autonomy to students allows them to make independent learning plans based on their different learning styles and prior knowledge. This creates a comfortable learning environment and complements the after-school exercises of MOOCs. While being strengthened over time, it will further improve learning motivation, help students develop good learning habits, and stimulate their enthusiasm.

4.4. Improve curriculum design through the principle of positive response

The principle of positive response emphasizes the need to strengthen and consolidate students' learning responses in time. Students are always in a state of active learning. Only when students actively embrace teaching materials can they be encouraged to participate in additional learning activities and truly master knowledge. On the contrary, students can only passively absorb knowledge in classrooms. Interacting with the instructor is a crucial factor that leads to dissatisfaction with online distance education models, such as MOOCs. In online classrooms, students cannot promptly raise questions about the content of the video. Even if they respond after reflecting, they have already missed window of opportunity for respond to be "positively strengthened." Therefore, in improving MOOC content, instructors should consider incorporating real-time thinking questions into their videos, such as subjective questions, multiple-choice questions, and those relating to right and wrong judgements. This method is conducive to students who need encouragement to think when watching the teaching videos. It allows students to make immediate responses to the questions and ensures that their responses are validated immediately, so that they can maintain a proactive learning state. MOOC videos are broken up into short micro-videos through the improvement suggestions of the "small steps" principle [14]. The advantage is that long course contents can be condensed into a shorter time, thus securing students' attention. In teaching activities with the purpose of "learning," effective interaction with questions interspersed in micro-videos can "awaken" students' independent thinking, stimulating them to respond to new knowledge [15].

5. Conclusion

Based on the above principles, it is possible to draw several lessons from applying traditional classroom teaching concepts to online educational settings. Skinner designed his programmed instruction in the 1930s, which became popular in American education circles in the early 1960s. These ideas have withstood the test of time and are still valid today. It cannot be denied that MOOCs' emergence has left a significant impact on traditional teaching models. Nevertheless, it will take time to determine whether Western teaching theories can be applied to Chinese educational practice. In spite of that, out of the urgent need for education reform, the mainstream view is that the dominant power of education should gradually shift from teachers to students. The amalgamation of MOOC curriculum design and behaviorism can improve students'

independent learning ability, stimulate their enthusiasm, and transform the impact of online education on traditional classrooms into an excellent support for traditional teaching models.

Disclosure statement

The author declares no conflict of interest.

References

[1] Haber J, 2014, MOOCs, The MIT Press, Cambridge MA.

[2] Asif AL, 2019, Research on User Experience Quality Monitoring and Management Technology for Cloud Platform, dissertation, Harbin Institute of Technology.

[3] Zhong BL, Fang F, 2015, The Development of "MOOC" and the Reform of University Talent Training Model. China Higher Education, 2015(21): 24–28.

[4] Zhao YC, 2018, A Survey of College Students' Satisfaction with MOOC and Its Influencing Factors. Higher Education Research, 2018(2): 73–78.

[5] Chinese Ministry of Education, 2007, College English Curriculum Requirements, Shanghai Foreign Language Education Press, Shanghai.

[6] Yang XH, Zhou XZ, Li YF, 2018, Research on Teaching Quality of Online Open Courses in Colleges and Universities from the Perspective of Value Subject Needs. China Audio-visual Education, 2018(7): 45–51 + 61.

[7] Chong DL, Zhi LY, Xi TH, 2003, Dictionary of Psychology, Volume 2, Shanghai Education Press, Shanghai.

[8] Yan L, 2009, On "Behaviourist Learning Theory," the Guiding Significance of Foreign Language Learning. Foreign Languages and Foreign Language Teaching, 6(2): 33–36.

[9] Li HL, 2020, The Application of Behaviorist Learning Theory in Improving MOOC Course Design. Journal of Zhangzhou Vocational and Technical College, 22(3): 26–30.

[10] Ping X, 2020, Research on the Application of MOOC-based Blended Learning in English Subject Education Curriculum. Frontiers of Foreign Language Education Research, 3(2): 43–49.

[11] Yang X, Zhou X, Li Y, 2018, Research on Teaching Quality of Online Open Courses in Colleges and Universities from the Perspective of Value Subject Needs. China Audio-visual Education, 2018(7): 45–61.

[12] Li GZ, 2002, The Learning Theory Foundation of Network Course Design. Distance Education, 21: 21–22.

[13] Shu QL, 2018, An Empirical Study on the Dynamic Adaptive System of Second Language Acquisition. Journal of Shaoguan University (Social Sciences), 1: 101–104.

[14] Yan LY, 2017, College English Teaching Model Innovation and Information Transformation in the Era of Big Data. Foreign Language Audio-Visual Teaching, 2017(4): 56–58.

[15] Ying CZ, 2018, A Survey of College Students' Satisfaction with MOOC and Its Influencing Factors. Higher Education Research, 2018(2): 73–78.