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# Research on the Dissemination and Influencing Factors of Big Data and Artificial Intelligence Related Courses in Colleges and Universities–Taking MOOC as an Example

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**Abstract:** The rapid development of information technologies such as artificial intelligence, Internet and big data has promoted the deep integration of technology and education, especially the rise of large-scale online courses, which provides a great opportunity for curriculum teaching reform in colleges and universities. At the same time, artificial intelligence, as a cutting-edge technology, has good development prospects and has become a popular professional course in colleges and universities, artificial intelligence technology has become the focus of subject education in many universities. The combination of online education and AI courses will also greatly enhance the enthusiasm of users and expand the dissemination scope of big data and AI related courses. Based on the grounded theory and technology acceptance model, this paper obtains the users' perception evaluation of learning MOOC big data and artificial intelligence courses through field interviews, summarizes the core categories, constructs MOOC user acceptance model, collects sample data by questionnaire and makes an empirical study. It is found that perceived usefulness, expectation confirmation and primary communication effect have a significant positive impact on the secondary communication effect, and the content quality and socialization interaction indirectly affect the secondary communication effect of MOOC curriculum by affecting the primary communication effect.

**Keywords:** Artificial intelligence; User behavior; MOOC

## 1 Introduction

Artificial intelligence (AI) was born in the 1950 s. At first, AI could only calculate, store and transmit information. Then, AI began to imitate people's information perception function, resulting

in great changes in human production and lifestyle. At present, emerging technologies represented by 5G, big data and artificial intelligence are in a period of highly active and intensive innovation, and an innovation network layout of interdisciplinary convergence, symbiosis and sharing of artificial intelligence has gradually formed. At the same time, as cutting-edge technologies, big data and artificial intelligence have good development prospects and become the focus of popular professional courses and discipline education in colleges and universities.

"Online education" and "online learning" have always been the focus of the education industry from germination to development [1]. The combination of online education and AI courses will also greatly enhance the enthusiasm of users and expand the dissemination scope of big data and AI related courses. As an online learning platform with a large audience, Massive Open Online Courses (MOOC) has been continuously introduced into college teaching activities because of its perfect functions, rich types of courses and large number of learners [2]. Colleges and universities use MOOC platform as a teaching auxiliary unit to provide students with autonomous learning opportunities, meet students' knowledge needs, and promote the dissemination and sharing of knowledge. Although MOOC has attracted much attention as a new thing, its application and dissemination have become a more practical problem. What factors are playing an important role in the process of MOOC communication in universities has become the focus of subsequent research on the construction of MOOC in Colleges and universities.

## 2 Research Design

### *2.1 Research Object*

This empirical study on the dissemination and influencing factors of big data and AI MOOC course takes college teachers and students as the survey object, mainly for the following reasons: (1) As of June 2021, the number of online education users in China has reached 325 million, accounting for 32.1% of the total Internet users, college teachers and students are an important part of online education users; (2) As the main audience of MOOC platform, college teachers and students use MOOC more frequently. Therefore, their use experience and feedback can play a certain role in optimizing MOOC learning experience and expanding communication ability.

This paper selects five universities: Wuhan University, Huazhong University of Science and Technology, Central China Normal University, Huazhong Agricultural University, and Wuhan Institute of Technology. According to the requirements of qualitative research methods of grounded theory, set the interview place, adopt the method of random sampling, and finally select 36 college students and 10 teachers as the interview objects.

### *2.2 Research Method*

This paper uses the grounded theory research method to obtain first-hand information through the combination of in-depth interview and focus group interview [3]. The interview was conducted from September 8 to September 20, 2021. Before the formal interview, a semi-structured interview outline was formed by referring to relevant literature [4], and guiding questions related to the service quality of mobile library were set. The interview was conducted from two aspects: the behavior of relevant communicators in the communication of MOOC big data and AI courses, and the attitude and behavior of the recipients. The interview contents are shown in Tab. 1.

**Table 1:** Outline of interview

| Number | Problems |
|---|---|
| 1 | Through which channels did you learn about MOOC courses on big data and AI? |
| 2 | How many MOOC courses on big data and AI have you studied (taught)? What are the reasons for learning (Teaching) these courses? |
| 3 | Do you insist on completing the selected courses? What is the driving force for you to insist on completing? If you don't finish it, what's the reason/Do you still want to continue teaching MOOC courses on big data and AI? What is the driving force for you to adhere to? |
| 4 | In the process of learning (Teaching) MOOC courses, where do you feel most satisfied and most dissatisfied? |
| 5 | What factors do you think may affect the dissemination of MOOC courses on big data and AI? Please give an example. |
| 6 | What did you (students) gain from MOOC courses on big data and AI course? What impact does it have on your study and life? |
| 7 | What impact do you think the learning effect of learning MOOC courses on big data and AI will have on your (students) next choice? |
| 8 | What do you think are the advantages and disadvantages of MOOC courses on big data and AI compared with traditional courses? |
| 9 | Will you recommend it to students or friends to use MOOC courses on big data and AI to further expand the influence of MOOC courses on big data and AI? |
| 10 | What do you think MOOC courses on big data and AI need to be improved? |

During the interview, first of all, it is necessary to determine whether the interviewees have used MOOC and whether they are familiar with the operation and plate setting of MOOC, then conduct the interview around the semi-structured outline, and record the interview content in the form of text and recording. The interview methods include personal in-depth interview and focus group interview. We conducted 10 personal in-depth interviews for 20–30 min each; 7 groups of focus group interviews, each 30–40 min, with 2–6 interviewees, a total of 46. The interview was conducted in a relaxing and comfortable place, which achieved good results and obtained rich and reliable first-hand data.

### *2.3 Category Extraction and Analysis*

#### *2.3.1 Open Coding*

Open coding is mainly to disrupt and decompose the obtained original data, and then recheck and summarize, in order to summarize and refine new concepts from the original sentences of the research object [5]. In this paper, 384 original sentences were obtained by dividing, recombining and refining the concept of data sentences. After labeling, conceptualizing and categorizing the 384 original sentences, 162 preliminary concepts were obtained, and 13 categories were obtained by further categorizing, respectively: convenience of content and form, content richness, content brand effect, diversity of ways, system stability, information accuracy, sense of use, timeliness of content, system interactivity, experience, system simplicity, social influence, system function completeness. The open coding process is shown in Tab. 2.

**Table 2:** Open coding

| Original material statement | Initial conceptualization | Categorization |
|---|---|---|
| Under the MOOC teaching mode, we can have more time to independently study big data and AI courses. | Autonomous learning | Convenience of content and form |
| We can freely arrange the time and place of learning big data and AI courses by using MOOC platform, which is very convenient. | Freedom in time | |
| I like the teaching of big data and AI courses in the form of MOOC, mainly because I can arrange my time more flexibly. | Flexible time | |
| Through searching, the learning resources of big data and AI courses provided by MOOC are also very rich. | Abundant resources | Content richness |
| Most of the teachers on the MOOC platform come from famous schools, so that we can feel the style of famous teachers without leaving home. | Famous teacher | Content brand effect |
| I think it is also very important whether the teachers who teach big data and AI courses on the MOOC platform come from famous schools. | Elite effect | |
| The teaching form of big data and AI courses provided by MOOC platform is very novel, which also changes the dull situation of traditional courses. | Novel form | Diversity of ways |
| If I am interested in the content of big data and AI courses offered by MOOC platform, I will actively use the platform for learning and convey this information to others. | Interesting content | |
| Many big data and AI courses provided by MOOC platform I saw were taught by playing videos, and the form was too single. | Single forms | |
| When watching MOOC teaching videos related big data and AI, there will be a problem that the teaching progress cannot be displayed. | Web display | System stability |
| When learning big data and AI courses using MOOC platform, you will have a bad impression if you can't open the course video or flash back. | Response speed of web page | |
| If the video is often stuck and cannot be clicked during the online learning of MOOC courses on big data and Tab. 1 AI, the sense of use will be very poor. | System stability | |

(Continued)

**Table 2:** Continued

| Original material statement | Initial conceptualization | Categorization |
|---|---|---|
| During the video learning of big data and AI course on MOOC platform, it is easy to be disturbed by the social information in the network and sometimes can't concentrate. | Learning not concentrated | Information accuracy |
| When conducting MOOC online search about big data and AI courses, the accuracy of information is also very important. | Accurate information | |
| Hope the big data and AI courses released on the MOOC online platform match my requirements and meet my own learning needs. | Demand matching | |
| In the course of learning big data and AI on MOOC platform, it's best if you can help me finish my homework and pass the exam. | Information content meets the needs | |
| Adding MOOC courses will aggravate our learning tasks. We need to watch videos after class, complete homework, and collect a lot of data to participate in the course discussion. We feel the task and pressure heavy. | Heavy learning tasks | Sense of use |
| If the online big data and AI teaching videos provided by MOOC take too long, I won't watch them. | Length of teaching time | Timeliness of content |
| In the process of learning big data and AI courses using MOOC platform, I hope some teachers can reply online in time. | Promptly interaction | System interactivity |
| The online learning of MOOC courses on big data and AI needs to register personal information. I'm worried about harassing calls or advertisements. | Personal privacy | Experience |
| During the online learning of MOOC courses on big data and AI, if there is a risk of disclosing personal information, I will stop using it immediately. | Privacy risks | |
| During the online learning of MOOC courses on big data and AI, if the registration process is too cumbersome, I will not better recommend it to others. | Easy system operation | System simplicity |
| If the online learning page setting of MOOC big data and AI course is not easy to operate, it will not be used frequently. | Page concise | |
| Before joining big data and AI course on MOOC platform, I will look at the number of people who have learned big data and AI courses. If there are a large number of people, I feel that the course quality may be better. | The influence of other people | Social influence |

(Continued)

**Table 2:** Continued

| Original material statement | Initial conceptualization | Categorization |
|---|---|---|
| Student comments under the big data and AI courses on MOOC platform will also affect whether I watch the course. | Others' comments | |
| When I use MOOC to study big data and AI courses, I pay more attention to whether the interface has navigation instructions, operation help and other functions. | System function | System function completeness |
| When using MOOC online platform for video learning of big data and AI courses, if the system has more humanized functions, it will further promote my online learning. | Customization function | |

### *2.3.2 Axial Coding*

Axial coding integrates a higher level of abstract categories through analysis of the concepts formed by open coding and the relationship between concepts [6]. Through further refining the data, this study obtains five main categories: perceived usefulness, content quality, social interaction, self-efficacy and Expectation Confirmation. These five main categories show the relationship between independent categories. The main category and category logic formed by axial coding are shown in Tab. 3.

**Table 3:** Axial coding

| Main category | Independent category | Category logic |
|---|---|---|
| Perceived usefulness | System simplicity | The more concise the interface of MOOC platform about big data and AI course, the better its communication effect. |
| | Complete system functions | When college students use MOOC to study big data and AI courses, they feel that the more complete the functions provided by MOOC platform, the more conducive to the dissemination of relevant courses. |
| Content quality | Convenience of content and form | The online learning of big data and AI course provided by MOOC has free time and place and convenient form, which is conducive to more convenient learning for college students, which will promote its further dissemination. |
| | Timeliness of content | Big data and AI course online learning video time provided by MOOC should be set reasonably. |
| | Content richness | MOOC courses on big data and AI can provide rich teaching resources for college students. |
| | Content Brand Effect | Famous schools and teachers play a key role in the selection of teaching videos for MOOC courses on big data and AI. |

(Continued)

**Table 3:** Continued

| Main category | Independent category | Category logic |
|---|---|---|
| Social interaction | System interactivity | The more interactive the MOOC platform system is, the more it can attract college students to use the platform to learn big data and AI courses, and it is also more conducive for college students to share it with others. |
| | Social influence | The recommendation or influence of external students or teachers will also promote college students to learn MOOC courses and improve their communication effect. |
| Self-efficacy | Diversity of ways | The more diverse the teaching methods of MOOC courses on big data and AI, the more interested and confident college students are to complete the course. |
| | Information accuracy | The more the video information provided by MOOC courses on big data and AI meets the needs of college students, the more confident college students are to learn the courses. |
| | System stability | The more stable the MOOC platform system is, the more conducive it is for college students to learn big data and AI courses. |
| Expectation confirmation | Sense of use | College students can feel satisfied after learning the big data and AI courses provided by MOOC platform |
| | Experience | After experiencing the big data and AI courses provided by MOOC platform, college students can well achieve their expected goals. The better the sense of experience, the more likely they are to be recommended to others. |

### *2.3.3 Selective Coding*

The task of selective coding is to systematically deal with the relationship between categories, determine the core category and secondary category, and form a grounded theory based on category relation. Core categories emerge naturally in open coding, and their main characteristics are: ①Core; ②Explanatory; ③Frequent reproducibility; ④It is easy to relate to other variables and has significance [7].

Through the progressive coding of selective coding, it is found that each main category focuses on the communication effect of big data and AI MOOC courses, so "the communication effect of big data and AI MOOC Courses" is defined as the core category. The relationship structure between the main categories and the representative statements of the respondents are shown in Tab. 4:

**Table 4:** Relational structure of selective coding

| Typical relationship structure | The connotation of relation structure | Representative sentence of interviewees |
|---|---|---|
| Content Quality→ Communication Effect of MOOC Courses on Big Data and AI | The big data and AI course resources provided by the MOOC platform will affect the cognitive judgment of college teachers and students on the MOOC platform, which will affect the choice of MOOC related courses by college teachers and students, it will also affect the publicity and promotion of the course by college teachers and students and its communication effect | Course quality is the core competitiveness of MOOC platform. Only when the resource content is rich and comprehensive, can I feel that the quality of course content provided by this platform is very high, which can promote me to learn more knowledge (Resource Richness→Communication Effect of MOOC Courses on Big Data and AI) |
| Perceived Usefulness→ Communication Effect of MOOC Courses on Big Data and AI | The perceived usefulness of MOOC platform is a subjective factor affecting college teachers and students to use MOOC for big data and AI course learning. The simplicity of the platform system and the completeness of functions will affect college teachers and students' choice of MOOC courses, which will also be conducive to the further dissemination of MOOC courses | Now all kinds of online learning platforms are doing well. If I can use the big data and AI courses simply and quickly provided by MOOC platform, I think this is useful for me, and I will also recommend it to relevant classmates and friends(simplicity→usefulness) |
| Social Interaction→ Communication Effect of MOOC Courses on Big Data and AI | Before college teachers and students contact the big data and AI courses provided by MOOC platform, the recommendation of external personnel to college teachers and students and relevant social evaluation will also promote the dissemination of MOOC courses | When choosing MOOC courses on big data and AI courses, the comment area under the course and the number of participants in the course will play a key role in my choice, which will also affect whether I recommend it to others (Social Influence → Social Interaction) |

(Continued)

**Table 4:** Continued

| Typical relationship structure | The connotation of relation structure | Representative sentence of interviewees |
|---|---|---|
| Self-efficacy → Communication Effect of MOOC Courses on Big Data and AI | When college teachers and students use MOOC platform to study big data and AI courses, if they think that using this platform can improve the learning effect, they can recommend it to others. | When I use the MOOC platform to study relevant big data and AI courses, I feel that this course can provide a variety of learning methods and enhance my interest and confidence in learning big data and AI courses, I will use it frequently, which will help me further learn relevant knowledge of big data and AI(Way Diversification→Self-efficacy) |
| Expectation Confirmation→ Communication Effect of MOOC Courses on Big Data and AI | After learning about the big data and AI courses provided by MOOC platform, when they think the knowledge they have learned meets their expectations, college teachers and students will better recommend it to others while learning by themselves, it can be better transmitted | After learning the big data and AI course provided by MOOC platform, the content I learned is consistent with the course described by the teacher. Then I will feel that this course is good, and I will carry out certain dissemination and recommend it to my classmates and friends (Self-perception → Expectation Confirmation) |

### *2.3.4 Theoretical Model*

The theory finally formed by grounded theory is called substantive theory. It is not completely equivalent to the formal theory formed by quantitative research. Formal theory is considered to be a systematic theory that transcends specific situations and can be widely tried. The substantive theory is the revelation of specific phenomena and their internal relations [8].

Build the model according to the story line obtained by three-stage coding, as shown in Fig. 1.

The basic function relationships contained in the model are: content quality, perceived usefulness, social interaction, Expectation Confirmation and self-efficacy. These five main categories have an impact on the communication effect of college big data and AI MOOC courses. Content quality includes four sub categories: convenience of content and form, content richness, content brand effect and timeliness of content; Socialized interaction includes two sub categories: system interactivity and social influence; Perceived usefulness includes two sub categories: system simplicity and system function completeness; Expectation Confirmation includes two sub categories: sense of use and experience; Self efficacy includes three sub categories: diversity of ways, information accuracy and system stability.

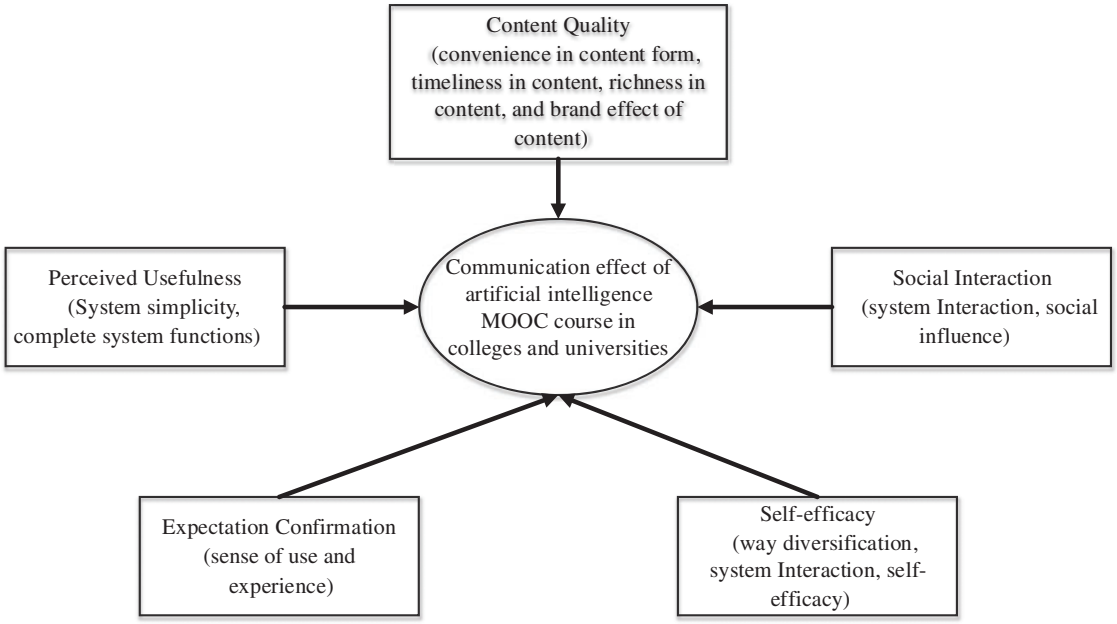


**Figure 1:** Influencing factors model of MOOC course communication effect based on user perception

### *2.3.5 Theoretical Saturation Test*

In order to ensure the reliability of the research, it is necessary to test the theoretical saturation of the coding results. Theoretical saturation means that the theory tends to be saturated when the data that can not further develop the characteristics of a certain category can not be obtained. After coding the previous data, this study selects samples for the second in-depth interview. This time, three students are selected for the interview. The interview time is about two hours, forming a new first-hand data. Through the sorting and analysis of the data, no new categories appear, indicating that the coding has reached theoretical saturation.

## 3 Research on Influencing Factors of MOOC Course Communication Effect of Big Data and AI in Colleges and Universities

### *3.1 Model Construction*

Combined with the coding results of grounded interview, considering that "learners' ability and level" and "platform and curriculum characteristics" will affect the effect of MOOC big data and AI courses in the communication process, three variables, self-efficacy, content quality and socialized interaction are added; the communication effect refers to the changes in the recipient's psychology and behavior before and after the action of the transmitted information [9]. The two-level effect theory of communication holds that the ultimate purpose of communication, that is, the social premise of communication, can be achieved only when the transmitted information is sent to the receiver's psychological system to transform the information into mentality energy, which is externalized or released into the receiver's behavior and produce practical results. The transformation of information into psychological energy is the premise of effective communication and an indispensable key procedure in the process of communication. Therefore, in this study, the primary communication effect and secondary communication effect in the secondary effect theory are introduced as variables to build

a model to systematically study the relevant factors affecting the communication effect of MOOC courses, and build a research model as shown in Fig. 2.

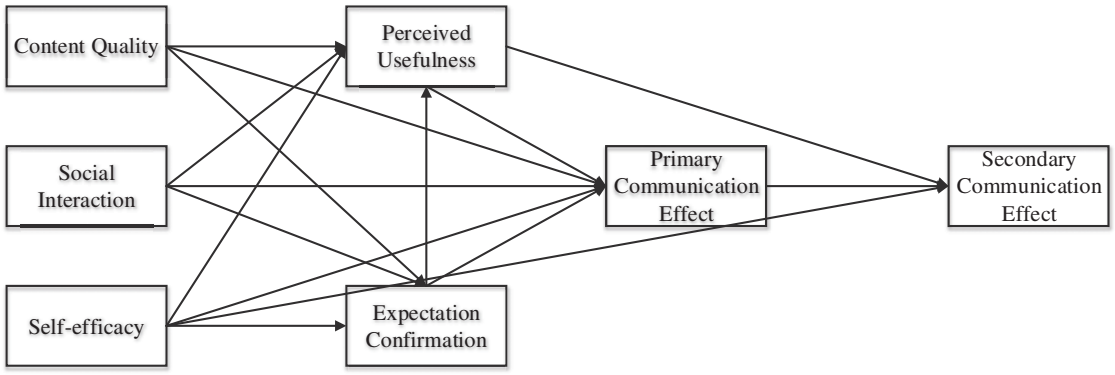


**Figure 2:** MOOC big data and AI course communication effect influencing factor model

### *3.2 Hypothesis*

The model variables of this study include three parts: platform and course characteristic variables, self-efficacy and information system model variables. The specific discussion and assumptions are as follows:

#### *3.2.1 Platform and Course Characteristic Variables*

(1) Content Quality

Content quality refers to the quality of big data and AI courses provided by MOOC platform, mainly involving video quality, chapter arrangement, key and difficult points and other relevant information [10]. If MOOC platform users perceive that the content quality of MOOC courses is high, and its updates are timely, it will enhance users' cognition of the content quality of MOOC big data and AI courses, so as to improve their perceived usefulness and expectation confirmation level. Moreover, the MOOC big data and AI course content quality is high, users can get better satisfaction, and it will also be more conducive to improve the primary communication effect of MOOC courses (Lin, et al., 2012 [11]; Cheng, 2014 [12]). Thus, we hypothesize that

H1. The content quality of MOOC big data and AI courses positively influences the perceived usefulness of MOOC users.

H2. The content quality of MOOC big data and AI courses positively influences the expectation confirmation of MOOC users.

H3. The content quality of MOOC big data and AI courses positively influences the primary communication effect of MOOC users.

(2) Social Interaction

Social interaction refers to the interaction between users and teachers and other participants in the process of learning big data and artificial intelligence courses on the MOOC platform, including: interacting with teachers and other learners through commenting or giving likes to on course content; through communicating and interacting with teachers and students in the MOOC big data and artificial intelligence courses discussion area; forwarding and sharing MOOC big data and artificial

intelligence courses. MOOC is different in form from traditional teaching methods. Users need to interact with teachers through the network, solve problems in the learning process, interact with other users in the virtual community, deepen their understanding of knowledge, and better master knowledge. If user interaction with teachers and other learners can be positively responded and supported, the user-perceived usefulness, expectation confirmation level, and dissemination effect of MOOC big data and artificial intelligence courses will be improved. Therefore, we hypothesize that

H4. The social interaction between MOOC big data and AI courses positively influences the perceived usefulness of MOOC users

H5. The social interaction between MOOC big data and AI courses positively influences the expectation confirmation of MOOC users

H6. The social interaction between MOOC big data and AI courses positively influences the primary communication effect of MOOC users

### *3.2.2 Self-efficacy*

Learners' self-efficacy refers to learners' self-assessment of whether they can use their abilities to complete learning tasks [13]. In the MOOC learning process, if the user has a positive self-evaluation of his future learning achievements, he will be more active in the learning process, be more determined to complete the MOOC big data and AI course learning, actively complete various tasks in MOOC learning with a better attitude, and well understand and master the course knowledge points, and finally achieved good course results. On the one hand, when users' self-efficacy continues to increase, they are more likely and willing to recommend the MOOC courses they have learned to others, which is conducive to the preliminary dissemination of MOOC big data and AI courses; On the other hand, the stronger the user's sense of self-efficacy, the greater the possibility of digest knowledge after learning big data and AI courses, which will help to promote the further dissemination of course content and enhance its dissemination effect. Thus, we hypothesize that

H7. The self-efficacy of MOOC big data and AI course users positively influences the perceived usefulness

H8. The self-efficacy of MOOC big data and AI course users positively influences the expectation confirmation

H9. The self-efficacy of MOOC big data and AI course users positively influences the primary communication effect

H10. The self-efficacy of MOOC big data and AI course users positively influences the secondary communication effect

### *3.2.3 Information System Model Variables*

(1) Perceived Usefulness

Perceived usefulness refers to the degree to which users perceive the use of information systems to improve their performance [14]. In MOOC learning environment, if users perceive that using MOOC big data and AI course services can improve their learning efficiency, deepen their understanding and mastery of knowledge, and enhance users' sense of usefulness, the more useful they perceive, the more likely they are to recommend them to their classmates and friends for use and learning, so as to enhance the communication effect of MOOC big data and AI courses. Moreover, they will better digest the

knowledge they think useful, which will also be conducive to the in-depth dissemination of MOOC big data and AI courses. Thus, we hypothesize that

H11. The perceived usefulness of MOOC big data and AI course users positively influences the primary communication effect of the courses

H12. The perceived usefulness of MOOC big data and AI course users positively influences the secondary communication effect of the courses

(2) Expectation Confirmation

Expectation confirmation means that the user will compare the actual use expectation with the expectation before use. If the actual use expectation is higher than the initial expectation, the user's expectation confirmation level will be higher [15]. Bhattacherjee(2001a) [16], Bhattacherjee(2008) [17] found that Expectation Confirmation affects users' cognition of the usefulness of the information system. If the course quality and learning expectation provided by the MOOC platform exceed the users' expected level, the users' Expectation Confirmation level is higher, which will improve the users' perceived usefulness. When the quality and learning expectation of big data and AI courses provided by MOOC platform exceed the user's expected level, users will most likely recommend MOOC courses to people around them for learning, so as to improve the communication effect of MOOC big data and AI courses. Thus, we hypothesize that

H13. The expectation confirmation of MOOC big data and AI course users positively influences their perceived usefulness

H14. The expectation confirmation of MOOC big data and AI course users positively influences the primary communication effect of the courses

(3) Communication Effect

The information transmitted by the online open class can only pass through the viewer's sensory organs and act on their psychological system, which is in line with the viewer's psychological choice, convert the received information into mentality energy, and produce the primary communication effect of the information dissemination of the online open class; and in the viewer's own practice and topic interaction, the mentality energy is externalized into behavior to produce a visible social communication effect, which is the secondary communication effect [18]. Thus, we hypothesize that

H15. The primary communication effect of MOOC big data and AI courses positively influences the secondary communication effect

### *3.3 Questionnaire Survey*

This paper collects data by means of network questionnaire. The questionnaire includes two parts of information: one is the survey on the basic situation of MOOC users, and the other is the specific variable measurement scale. Based on the mature scale at home and abroad, combined with the characteristics of MOOC big data and AI course education, the variable measurement scale is designed, and the scale is improved according to the opinions of experts, the final scale was formed.

The questionnaire was distributed through the online questionnaire platform, and users who had studied big data and AI related courses on the MOOC platform were invited to fill in the questionnaire with the help of wechat, QQ and other social media. Finally, 223 valid questionnaires were recovered. Among them, men accounted for 40.4% and women accounted for 59.6%. The educational background included undergraduate (82.5%) and master's degree (17.5%); The weekly learning time is divided into less than 1 h (51.6%), 1–3H (39.9%), 3–5 h (4.5%) and more than 5 h (4%);

The duration of use is divided into less than 3 months (67.3%), 3–6 months (17.9%), 6–12 months (5.4%) and more than 12 months (9.4%). It can be seen that the survey sample covers all kinds of people who study MOOC big data and AI courses at different times. It is representative and can be analyzed in the next step.

### *3.4 Analysis*

Smartpls2.0 was used to test the reliability and validity of the questionnaire, cronbach ' s $\alpha$ values are all greater than 0.6665, which is within the acceptable range(Chin, 1998 [19]), the composite reliability of each variable is greater than 0.7960, indicating that the measurement model has good reliability (Fornell, et al., 1981 [20]), can be used for the next regression analysis.

Smartpls2.0 is used to verify the model path, and the results are shown in Fig. 3. According to the model path coefficient and its significance level, only the hypothesis "H5: The social interaction between MOOC big data and AI courses positively influences the expectation confirmation of MOOC users, and the other 14 assumptions are tenable, as shown in Tab. 5.

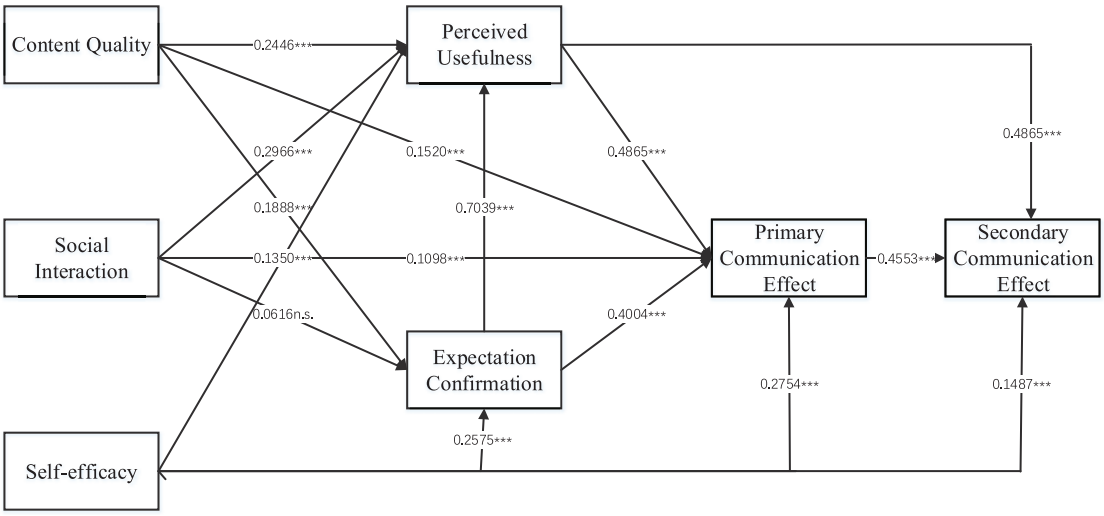


**Figure 3:** Model path coefficient value and significance level

**Table 5:** Model hypothesis verification

| Hypothesis | Model path | Path coefficient | t Value |
|---|---|---|---|
| H1: The content quality of MOOC positively influences the perceived usefulness of MOOC users. | CQ→PU | 0.2446*** | 6.0241 |
| H2: The content quality of MOOC positively influences the expectation confirmation of MOOC users. | CQ→EC | 0.1888*** | 5.6384 |

(Continued)

**Table 5:** Continued

| Hypothesis | Model path | Path coefficient | t Value |
|---|---|---|---|
| H3: The content quality of MOOC positively influences the primary communication effect of MOOC users. | CQ→PC | 0.1520*** | 3.5562 |
| H4: The social interaction positively influences the perceived usefulness of MOOC users | SI→PU | 0.2966*** | 10.2958 |
| H5: The social interaction positively influences the expectation confirmation of MOOC users | SI→EC | 0.0616n.s. | 1.7818 |
| H6: The social interaction positively influences the primary communication effect of MOOC users | SI→PC | 0.1098*** | 2.7129 |
| H7: The self-efficacy of MOOC users positively influences the perceived usefulness | SE→PU | 0.1350*** | 4.5691 |
| H8: The self-efficacy of MOOC users positively influences the expectation confirmation | SE→EC | 0.2575*** | 5.8460 |
| H9: The self-efficacy of MOOC users positively influences the primary communication effect | SE→PC | 0.2754*** | 10.4740 |
| H10: The self-efficacy of MOOC users positively influences the secondary communication effect | SE→SC | 0.1487*** | 4.4223 |
| H11: The perceived usefulness of MOOC users positively influences the primary communication effect of the courses | PU→PC | 0.4865*** | 17.7269 |
| H12: The perceived usefulness of MOOC users positively influences the secondary communication effect of the courses | PU→SC | 0.2351*** | 7.5382 |
| H13 The expectation confirmation of MOOC users positively influences their perceived usefulness | EC→PU | 0.7039*** | 35.0383 |
| H14: The expectation confirmation of MOOC users positively influences the primary communication effect of the courses | EC→PC | 0.4004*** | 10.6712 |
| H15: The primary communication effect of MOOC course positively influences the secondary communication effect | PC→SC | 0.4553*** | 17.0091 |

Note: ps: ***, $p < 0.001$; n.s, $p > 0.05$.

Perceived Usefulness ($\beta = 0.2351$, $p < 0.001$) and Primary Communication Effect ($\beta = 0.4553$, $p < 0.001$) significantly and positively affect the Secondary Communication Effect of MOOC courses on big data and AI, Expectation Confirmation indirectly affects the Secondary Communication Effect of MOOC courses on big data and AI by affecting Perceived Usefulness and Primary Communication Effect, which is consistent with the relevant research conclusions on the continuous use of information systems. From the perspective of path coefficient, the Primary Communication Effect of big data and AI courses in MOOC has a greater force on the Secondary Communication Effect, reaching 0.4553, and the force of Perceived Usefulness on the Secondary Communication Effect has reached 0.2351. For each unit of user's Perceived Usefulness, its Secondary Communication Effect will increase by 0.2351;

for every unit increase in Primary Communication Effect, its Secondary Communication Effect will increase by 0.4553.

Content Quality has a significant positive impact on Perceived Usefulness ($\beta = 0.2446$, $P < 0.001$), Expectation Confirmation ($\beta = 0.1888$, $P < 0.001$) ($\beta = 0.1520$, $P < 0.001$), Social Interaction has a significant positive impact on Perceived Usefulness ($\beta = 0.2966$, $P < 0.001$) and Primary Communication Effect ($\beta = 0.1098$, $P < 0.001$), the impact of Social Interaction on users' Expectation Confirmation did not reach a significant level. From the perspective of path coefficient, the force of Content Quality on Perceived Usefulness is large, which is 0.2446.

Self-efficacy has a significant positive impact on Perceived Usefulness ($\beta = 0.1350$, $P < 0.001$), Expectation Confirmation ($\beta = 0.2575$, $P < 0.001$), Primary Communication Effect ($\beta = 0.2754$, $P < 0.001$) and Secondary Communication Effect ($\beta = 0.1487$, $p < 0.001$).

## 4 Discussion and Conclusion

### *4.1 Conclusion*

Through the interview on the acceptance of College MOOC big data and AI course users, this paper extracts variables, constructs theoretical models, and puts forward corresponding research hypotheses. Combined with relevant theories, this paper collects data to empirically verify the relevant influencing factors of MOOC big data and AI course communication effect, so as to provide practical data support for follow-up research.

The research data show that content quality, social interaction, self-efficacy, perceived usefulness and Expectation Confirmation all have a certain impact on the development of college big data and artificial intelligence courses on MOOC platform. In order to further improve users' acceptance of MOOC big data and artificial intelligence courses and enhance the influence of MOOC college big data and artificial intelligence courses among teachers and students, this paper mainly puts forward targeted suggestions from three aspects: user needs, content quality and user experience, so as to provide some reference and suggestions for promoting the dissemination and user acceptance of college big data and artificial intelligence courses in MOOC environment.

### *4.2 Development Countermeasures and the Suggestions*

#### *4.2.1 Meet User Needs and Improve Perceived Usefulness*

Under the learning environment of MOOC courses on big data and AI, the mobile and convenient characteristics of MOOC attract users to learn not only in traditional course, but also in online courses for consolidating the knowledge they have learned and expand their knowledge. Users form their Expectation Confirmation, Perceived Usefulness and Evaluation of Satisfaction during and after use. The more MOOC courses on big data and AI meet their own expectations, the higher the users' Expectation Confirmation. Good Perceived Usefulness and better Primary Communication Effect will enhance the Secondary Communication Effect of MOOC courses. At the same time, users' Perceived Usefulness will enhance the user experience, so as to improve the Primary Communication Effect. Therefore, the producers and providers of MOOC courses on big data and AI need to strive to meet the practical needs of university users' online learning, enhance users' Perceived Usefulness, attract users to use fragmented time for online learning, and improve the utilization of online learning resources.

#### *4.2.2 Improve Content Quality and Encourage Interactive Communication*

When users of MOOC courses on big data and AI conduct online learning, the Content Quality of the courses will positively affect users' Perceived Usefulness of the course, the Expectation Confirmation after use and its Primary Communication Effect, thus affecting the Secondary Communication Effect of MOOC courses on big data and AI. Social Interaction refers to the communication and interaction between users, teachers and other learners in the learning process of MOOC courses on big data and AI. It can help users solve the problems and puzzles they encounter in learning. Through discussion with teachers and other learners, they can deepen their understanding and mastery of learned knowledge, and enhance their Perceived Usefulness and Satisfaction. MOOC is an online classroom where advantageous schools promote their excellent courses online for more people to learn. While paying attention to the Content Quality, MOOC should also attract the active participation of users, strengthen the interactive communication between users and teachers and other scholars, activate the online learning atmosphere, help users better participate in it and master the course knowledge.

#### *4.2.3 Create A Successful Experience and Enhance User's Confidence*

The learning of online MOOC courses on big data and AI is different from the traditional classroom face-to-face teaching. Users need to use mobile terminal equipment and mobile network for learning. If users believe that they can deal with various problems encountered in the learning process with their own ability, it will positively affect their sense of Self-efficacy and Expected Results, so as to enhance their Expectation Confirmation level, then affect their Perceived Usefulness and Primary Communication Effect, and finally affect the Secondary Communication Effect of MOOC courses on big data and AI. Therefore, in order to expand the influence and dissemination scope of big data and AI courses, users should enhance their successful experience and self-confidence; Secondly, we should enhance the emotional communication and interaction between teachers and users, other learners and users. The guidance of teachers and the communication and discussion between users and other participants will spark their thoughts and improve their enthusiasm and self-confidence; In addition, users' self-monitoring ability should be enhanced, Users' self-monitoring is conducive to users' self-summary and self-growth, enhance their sense of Self-efficacy, and finally improve the effect of users' online learning [21].

### *4.3 Limitations and Future Directions*

Although this paper discusses the influencing factors and paths of MOOC big data and artificial intelligence course dissemination, there are still some deficiencies that need to be improved in the follow-up research. Firstly, this paper explores the possible influencing factors and the relationship between influencing factors through the interview method, but the number of interviews is small, and the extraction of influencing factors may not be comprehensive enough. In the follow-up, it is necessary to expand the scope of interviews and improve the preciseness of the research. Secondly, the courses communication effect proposed in this paper is a dynamic and continuous process. In the follow-up research, the cross time point survey method should be used for longitudinal tracking test.

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