

# Research of Classroom Interaction based on the UMU Interactive Learning Platform

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## Abstract

**This paper focuses on the problems of narrow beneficial coverage of interaction, single form of classroom interaction applied in the traditional classroom interaction and insufficient depth of interaction content, and it uses NVivo qualitative analysis software to analyze students' interactive content of a lesson produced on the UMU interactive platform, and explore the realization of classroom interaction based on BYOD and UMU. The results show that: (1) The online classroom interaction based on UMU helps to mobilize the enthusiasm of students to participate in classroom interaction and broaden the benefited range of classroom interaction. (2) The online classroom interaction based on UMU helps to enrich the interactive form of classroom teaching. (3) The Online classroom interaction based on UMU helps to improve the efficiency of classroom interaction and expand the depth of students' participation in classroom interaction. We hope this paper can provide a useful reference for teachers to improve the interaction effect of classroom teaching and effectively achieve teaching goals.**

## Keywords

**Classroom Interaction, Bring Your Own Device, Interactive Learning Platform, Qualitative Analysis.**

## 1. Introduction

Classroom interaction, also known as teaching interaction or instructional interaction, is an indispensable part in teaching activities. Classroom interaction is an event occurring between students and learning environment, which includes the communication between students and teachers, students and students, as well as the interaction between students and various materialized resources.<sup>[1]</sup> Meanwhile, classroom interaction is the main factor to mobilize the participation in the class process and form a benign interaction between them around the realization of instructional objectives.<sup>[2]</sup> Combining the two, it is not difficult to see that classroom interaction not only emphasizes the interaction between the participants, interactive behavior, learning resources and environment, but also cannot ignore the importance of the instructional objective. Classroom interaction needs to focus on how to achieve instructional objectives more effectively and adopt appropriate interactive modes.

Generally, the traditional classroom interaction mainly refers to the communication and discussion between teachers and students on the teaching topic and content in the classroom, which can not only help students make a definite learning goal, but also help teachers understand students' mastery of the learning content, so as to adjust the teaching progress in time. The participants, the content, the behavior and the space-time are synchronous and consistent, which facilitates the close and timely communication between teachers and students, promotes the emotion between teachers and students, and enhances the class cohesion. However, there are still some deficiencies in traditional classroom interaction in the classroom. Firstly, due to limited time, the number of students participating in the classroom

interaction is limited to few individuals, while the rest of the students are in a silent state. Secondly, the interactive mode between teachers and students is single, mainly oral interaction, so the expression and communication is relatively simple, which affects the extensive expansion of interactive content. Thirdly, due to the limited class time and the narrow participating range of the interaction, it is difficult to effectively realize the in-depth exploration of the classroom interactive content, which hinders students from further understanding and mastering the learning content and affects the teaching quality and effect.

The publication of Education Informatization 2.0 Action Plan signifies that education informatization in China has stepped from Period 1.0 to Period 2.0, and the era of Education 2.0 has brought the stage of technology and education "additive" into the stage of "integration", which is more in-depth and comprehensive. [3] With the help of policy guidance, financial and technical support, the vast majority of schools in China have allocated modern information teaching equipment, installed wireless network resources and carried out extensive information-based teaching and training for teachers. Most of educational researchers try to solve and make up for the shortcomings in teaching by constantly applying information technology to optimize education. The study tries to use UMI to support classroom interaction among students in class for solving the problems of traditional interaction, collect and analyze interactive data through UMI in order to improve the quality of classroom interaction and optimize the effect of teaching and learning.

## 2. Methodology

### 2.1. Research Method

Qualitative research is considered to be an activity of using researchers themselves as research tools and taking various data collection methods in natural situations to explore social phenomena as a whole, mainly using inductive method to analyze data and form theory, and gaining explanatory understanding of their behavior and meaning construction through interaction with research objects.[4] Accordingly, qualitative research emphasizes the process, situation and concreteness of research, and has a holistic and explanatory understanding of the "quality" of things. NVivo11 is a computer-aided qualitative analysis software developed and designed by QSR company, which supports the analysis of different types of data, including texts, graphics, sounds and videos, etc., whose advantage is its powerful coding function. NVivo 11 is used to analyze the interactive content and form different coding levels, and then we make a holistic understanding of the classroom interaction among students.

### 2.2. Research Object

BYOD is the abbreviation of bring your own device, refers to that teachers and students choose and use portable mobile terminal devices with multimedia network function to carry out teaching activities according to their own wishes, so as to improve teaching efficiency and learning effect. This research specially refers to the mobile intelligent terminals represented by smart phones and tablet computers. The development of information technology provides great convenience and possibility for "situational" teaching activities. Teachers and students can fully tap the practical value of various technical equipment including smart phones, tablet computers, wearable devices and virtual reality devices in teaching. This breaks the boundaries of traditional teaching in and out of class, online and offline, learning and work, and realizes the seamless integration of learning and life. It is not only the concrete manifestation of the explicit form of blended learning, but also the internal requirement of learning situational nature.[5]

At present, the mobile intelligent terminal represented by smart phones and tablet computers integrates various technologies such as multimedia, wireless network and mobile communication. It has changed from traditional communication tools to diversified tools

integrating communication, entertainment, and work, and has become a sharing tool for students' learning and communication. In addition, relying on smart phones and tablet computers, the educational app, with its large display screen, powerful interactive features, good user experience and convenient network communication, has quickly won the favor of the majority of learners. The UMU interactive learning platform is an interactive educational APP which is easy to use, full-featured and free of charge, and it is accepted and applied to interact in class by teachers and students. [6]

In this study, 31 students from class J of college I of Y University in the southwest of China are taken as research objects. Taking a real compulsory public course teaching as a case study, the course using UMU as an interactive aid is selected for research and analysis, and the teaching time is one lesson about 45 minutes. Due to they have practiced UMU for the past weeks, the students are familiar with the function of BYOD and UMU.

### 2.3. Data Collection

The teaching activities of teachers and students are constantly promoted around the instructional objectives. After the interactive theme is determined, the teacher encourages all students to express their views and opinions through UMU. Although face-to-face oral interaction is also involved, it occupies a small proportion of the whole classroom interaction in the class. Therefore, the online classroom interaction based on UMU is mainly analyzed in this article.

In class, the teacher initiates two discussions on "The relationship between education and technology" and "Can technology replace teachers?" by UMU. The purpose of the online interaction is to expand the content of this chapter and further help students understand the nature of technology, the relationship between technology and education, and so on. The online open interaction of "Can technology replace teachers?" is taken as an example to analyze the benefited range, breadth and depth of online interaction. The teacher sets this discussion as a compulsory part, and each student must submit his/her opinion to get points; at the same time, the teacher allows anonymous views and mutual praise and evaluation between classmates. Meanwhile, the discussion topic is explained and noted by the teacher to help the students understand the discussion topic clearly. After completing the above preparation, all students are invited to publish their ideas and opinions on UMU through their own devices synchronously and interact with each other within 5 minutes.

Under the condition that the class time remains unchanged, UMU can support synchronous online interaction for many students, and the teacher guides all students to participate in the synchronous online interaction in the given time. The opinions submitted by the students in real time can be seen by teachers and students in the classroom through the electronic screen, which promotes mutual praise, evaluation and exchange among students, and also helps teachers check the progress of discussion at any time and dynamically adjust the discussion.

After centralized submission of the views, UMU operated by the teacher displays the number of interactive participants and the total number of submissions on the electronic screen. Statistics show that a total of 45 submitted opinions that two students sent their own opinions twice and peer responses are 12 times) and 159 mutual praises among students are published within 5 minutes on UMU.

### 2.4. Data Extraction Strategies

In this study, we download the data saved by UMU after class to avoid disturbing the progress of the class teaching, use NVivo 11 to code the textual materials submitted by students, and obtain the content of "Can technology replace teachers?". After obtaining the textual materials for collective discussion, we carefully read all the submitted opinions, decompose, label and code them, and get the core meaning of the students. The coding is classified to form sub-nodes,

and then each node is classified to form tree-like nodes with hierarchical relationship, and the students' views are analyzed to understand the students' mastery of technology.

### 3. Results

According to the background data of UMU, it is found that the proportion of students' participating in classroom interaction is 100%. Each student has published his/her own views on the topic and participated in the interaction on UMU. Based on learning about technology last week, students further learn technology and form new understandings on technology. Classroom interaction should promote the deep understanding of principles and concepts through effective information interaction, so as to achieve the purpose of promoting learning. [7] Many students not only make the judgment whether technology can replace teachers, but also further elaborate their own views through the platform.

Table 1: The students' views on the interactive topic

Parent Node	Child Node	Reference Point	Reference Point Example
I	1.Technology can replace teachers	17	Technology can reduce teachers' pressure.
	2.Technology cannot replace teachers	48	If robots are used to teach, the cost is too high.
II	1.View on technology	11	Technology has to be developed by human beings.
	2.View on the practice subject	46	Students learn to be human first and then to learn.
	3.View on value and emotion	8	Modern people pursue science, technology and humanistic spirit.

Professor Mang Li once pointed out that it is not easy to accurately answer the question what is technology. People's understanding of technology is constantly changing, and there is no unified conclusion on the understanding of technology. [8] Students' views on technology confirm this statement. Students' views can be divided into two categories which include the above five sub-themes formed by labeling and coding according to students' views: views on technology can replace teachers; views on technology cannot replace teachers; views on technology; views on practice subject; views on value and emotion, as shown in Table 1.

### 4. Conclusions and Discussions

This study based on the combination of BYOD and UMU tries to solve the prominent interaction problems in traditional classroom interaction, with qualitative analysis software of NVivo 11 and qualitative research method, analyses all the content of the classroom interaction from UMU, and draws the following conclusions:

Firstly, all students participate in the classroom interaction through UMU within a given time, which not only ensures the fairness of classroom interaction, but also plays a certain role in mutual supervision of students' learning and thinking, and saves time compared with traditional face-to-face oral interaction. Classroom interaction online among students breaks

the traditional classroom interaction which is limited to the interaction between few students and teachers, and is conducive to mobilize synchronously all students to carry out multi-dimensional content discussions in an effective time.

Secondly, from the perspectives of students' discussion, students' understanding of technology is not limited to the concepts in textbooks. Students' understanding of technology extends five sub-themes, and so far we can conclude that students have an open, personalized and comprehensive understanding of technology.

Thirdly, students' discussion of the topic deepens the analysis of the advantages and disadvantages of technology, the influence on teachers and students, and emotion and value. With the online evaluation between students' peers and the guidance of teachers, the discussion content will be gradually advanced, helping students to deepen the content of discussion gradually. Furthermore, it will also help students to achieve in-depth thinking and exploration, and make preparations for students' independent learning.

Education informatization provides material basis for classroom interaction, improves the shortcomings of traditional classroom interaction, provides favorable support for students' learning, and helps teachers and students to achieve instructional objectives effectively. At the same time, the teacher plays an irreplaceable role in helping the students understand knowledge, inspiring students to think, guiding students to interact, regulating the progress of discussion, and instructing students to achieve learning objectives etc.

## 5. Limitations and Future Research

This study uses NVivo qualitative analysis software to analyze the interactive content of a classroom generated on UMU. The classroom interaction based on UMU solves the problems of narrow beneficial coverage, insufficient depth of interactive content and single interactive form in traditional classroom interaction to some extent. However, the research object is the teaching interactive content of a certain classroom based on UMU, so the research sample has limitations. It is necessary to increase research objects later, extend the research time, and improve the analysis of the teaching interactive effect based on UMU.

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