Investigation of the Impact of OBE-Based Teaching Reform on Students’ Learning Experiences: From the Perspective of Self-Determination Theory

Abstract
This study employed a questionnaire survey method and utilised the Self-Determination Theory as a theoretical framework to simulate students’ “needs”. The aim was to investigate the impact of OBE-based teaching reform on students’ academic achievement, satisfaction, autonomy, competence, and relatedness. The study used a quasi-experimental research design with 80 students from Changzhi Medical College as the sample and found that OBE teaching can improve students’ academic achievement, especially for middle and low-performance students. It can improve students’ satisfaction with the course and relatedness experience.

Keywords: outcome-based education, self-determination theory, academic achievement, learning satisfaction

Introduction
In order to improve the quality of audio and video program production courses, scholars have put forward various solutions, among which Outcome-Based Education (OBE) has a certain impact on the educational concept and talent training of universities. OBE is an educational concept that is oriented towards students’ Academic Achievement. It requires educators to break the traditional subject-oriented
education concept, set professional training objectives and graduation require-
ments in reverse according to the needs, then construct the curriculum system and
redesign the teaching objectives and teaching process of a single course (Wang,
2020). Therefore, it is worth paying attention to whether OBE impacts students’
learning and what kind of impact it will have. This study used Self-Determination
Theory (SDT) as the theoretical framework and questionnaire survey to explore
the influence of OBE on the Academic Achievement, Learning Satisfaction and
learning experience of different student groups.

Outcome-Based Education (OBE) was first proposed by Spady (1994). He
believed that OBE could improve students’ probability of success in the expected
life. It paid more attention to students’ practical experience. OBE is more innova-
tive than the traditional education model. It focuses on what students get from
learning and whether the results are conducive to students’ success rather than
how students learn and when they learn. Once OBE was put forward, it was widely
recognised by academic and educational circles.

In the late 1990s, teaching reform based on OBE was implemented in Canada,
the United States, New Zealand, South Africa, and Australia. At the same time,
there have been many studies based on OBE curriculum reform in different
disciplines, such as the study on English curriculum (Berlach & O’Neill, 2008),
the study on industrial training (Osman et al., 2009), research on engineering
curriculum (Hegde & Rao, 2015), etc.

In addition, many scholars have discussed the influence of the OBE concept on
educational philosophy, teaching concept, curriculum design and other aspects.
For example, Malan (2010) believes that the OBE concept is an eclectic educational
philosophy that draws the essence from the previous methods and builds it into
a new visionary system. Killen (2000) explores some of the fundamental principles
of OBE-based education and relates them to the Australian school and vocational
education context to help teachers understand how to translate the theory and
philosophy of OBE into practical action in lesson planning, teaching and student
learning assessment.

In China, there have been attempts and related research on teaching reform
based on the OBE concept in computer software and application, foreign lan-
guages, architectural science, engineering, etc. Educators in various professional
fields discussed the OBE concept and the teaching reform based on it from the
basic concept, characteristics, implementation principles and main contents, and
compared it with traditional education.

There are relatively few researches on teaching reform combining the OBE con-
cept with audio and video program production course. Yan (2019) elaborated on
the necessity of teaching reform of current TV program production course based on the OBE concept, and explored the teaching reform based on the OBE concept from the perspectives of students’ abilities, evaluation criteria, curriculum design, etc. Wang (2020) suggested that the course reform of audio and video program production should be: reverse design and reshape the teaching system; Positive implementation, change teaching methods; Classroom empowerment, deepening independent and innovative learning.

According to Ryan and Deci (2000), Self-Determination Theory (SDT) is a kind of motivation theory, which attempts to explain people’s internal “needs”, which might affect their experience and performance in a specific environment, such as the learning process. According to SDT, Autonomy, Competence, and Relatedness are the three basic innate psychological needs. These three qualities are “essential to support the optimised operation of natural growth and integration trends, as well as constructive social development and personal well-being” (Joo et al., 2013).

SDT was chosen as the framework to test whether and how the OBE affects students’ Autonomy, Competence, Relatedness, Academic Achievement and Learning Satisfaction.

The following are specific research questions:

RQ1: Does the implementation of OBE help improve students’ Academic Achievement?

RQ2: Does the implementation of OBE help improve students’ Learning Satisfaction?

RQ3: Does the implementation of OBE help to enhance the three dimensions of SDT in the learning process of students, namely Autonomy, Competence, and Relatedness?

Research Methodology

Research Background

In recent years, with the rapid development of media technology and the constant update of media platforms, the trend of fine differentiation of media use by audiences has become increasingly apparent, which puts forward higher requirements for all types of media content production. As an important part of media content production, Audio and Video Programs still have a very wide range of audience groups in the present when media content is extremely rich. All kinds of media platforms of audio and video programs have high expectations for practitioners’
practical ability and experience, especially the ability of professionals to solve real problems.

For a long time, courses related to Audio and Video Program Production have been important content for students majoring in media in colleges and universities to learn. However, in the talent market, a contradiction exists between students’ employment difficulties and employers’ recruitment difficulties. Behind this, the university talent training work and social employers’ talents must be disconnected. In the talent training of college media majors, Audio and Video Program Production Courses undertake the dual tasks of cultivating students’ practical ability and content production and communication skills (Wang, 2020). However, there are many problems in traditional Audio and Video Program Production Courses, such as outdated teaching content, old-fashioned teaching design, single assessment method and evaluation standard (Yan, 2019). On the one hand, the teachers under the traditional teaching mode cannot break through the barriers of indoctrinate-type education. Thus, it is difficult to improve the teaching quality. On the other hand, it is difficult for students to maintain a high enthusiasm for practical elective courses, which cannot arouse students’ active interest in practice. In the current media revolution, it is an urgent problem how to improve students’ practical ability in the teaching process of relevant courses, so that students can be qualified for the job requirements as soon as possible after stepping into the job, how to alleviate the disconnection between college talent training and social talent demand, improve the current situation of college students’ “excess theoretical knowledge but insufficient practical ability” to the greatest extent, and train more talents to adapt to the development of media in the new era.

Sample

This study used the convenience sampling method to sample 80 students learning the audio and video program production course at Changzhi Medical College. The students were from two classes (40 students each) in the same major. Convenience sampling can provide a feasible and cost-effective solution in situations where the target population is difficult to access, or the sample size is relatively small (Cook et al., 2000).

Instruments and Procedures

The instruments in this study mainly include tests of Academic Achievement, tests of Learning Satisfaction, and tests of the three dimensions of SDT. The details are as follows:
The students’ Academic Achievement includes two parts: pre-test results and post-test results. The pre-test score is the score of the first assignment at the beginning of the course, and the post-test score is the final score of the students at the end of the course, which is composed of the process evaluation (accounting for 40%) and the final assignment score (accounting for 60%).

Learning Satisfaction was measured using the “Satisfaction” subscale in the widely used Standardized Instructional Material Motivation Survey (IMMS) (Keller, 2010), consisting of 4 questions.

Specifically, the measurement of the participants’ Autonomy referred to the work of Standage et al. (2003) with some adjustments. The Competence measurement questions for the students were drawn from McAuley’s et al. (1989) Intrinsic Motivation Inventory (IMI) scale, with appropriate adjustments. Relatedness was measured with reference to the acceptance subscale of the Need for Relatedness Scale (Richer & Vallerand, 1998). This scale, originally developed to assess kinship needs in the workplace, was modified in this study to ask questions such as: “With the other students in this class, I feel supported” and “With the other students in this class, I feel listened to” and so on. After the test, the three dimensions of SDT and the Learning Satisfaction questionnaire have good reliability and validity (Tables 1 and 2).

### Table 1. Reliability and Validity Test

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Items</th>
<th>Unstd.</th>
<th>S.E.</th>
<th>Z</th>
<th>P</th>
<th>Std.</th>
<th>Cronbach’a</th>
<th>CR</th>
<th>AVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAT</td>
<td>S1</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.740</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>S2</td>
<td>0.802</td>
<td>0.140</td>
<td>5.709***</td>
<td></td>
<td>0.664</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>S3</td>
<td>0.853</td>
<td>0.132</td>
<td>6.489***</td>
<td></td>
<td>0.751</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>S4</td>
<td>1.002</td>
<td>0.163</td>
<td>6.156***</td>
<td></td>
<td>0.714</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AUT</td>
<td>A1</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.771</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A2</td>
<td>0.993</td>
<td>0.196</td>
<td>5.066***</td>
<td></td>
<td>0.579</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A3</td>
<td>1.030</td>
<td>0.135</td>
<td>7.634***</td>
<td></td>
<td>0.842</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A4</td>
<td>0.896</td>
<td>0.155</td>
<td>5.771***</td>
<td></td>
<td>0.653</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM</td>
<td>C1</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.441</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>C2</td>
<td>1.582</td>
<td>0.435</td>
<td>3.640***</td>
<td></td>
<td>0.794</td>
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<td></td>
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<tr>
<td></td>
<td>C3</td>
<td>1.129</td>
<td>0.402</td>
<td>2.811 0.005</td>
<td></td>
<td>0.445</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>C4</td>
<td>1.867</td>
<td>0.519</td>
<td>3.598***</td>
<td></td>
<td>0.759</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>REL</td>
<td>R1</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.744</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>R2</td>
<td>1.059</td>
<td>0.169</td>
<td>6.272***</td>
<td></td>
<td>0.721</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>R3</td>
<td>1.198</td>
<td>0.166</td>
<td>7.207***</td>
<td></td>
<td>0.824</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>R4</td>
<td>1.156</td>
<td>0.161</td>
<td>7.161***</td>
<td></td>
<td>0.819</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
As shown in Table 1, Cronbach’s α of all variables was higher than the minimum critical value of 0.70, and the combined reliability (CR) was greater than 0.7, indicating that the scale in this study had high reliability. Secondly, the factor loading and mean variance extraction (AVE) of all variables in this study were all greater than 0.7 and greater than 0.5, which were statistically significant, so the aggregate validity of the scale was good.

In Table 2, the bold diagonal letters represent the square root of AVE, and the triangular numbers below the diagonal represent the Pearson correlation of each dimension. The square root of the AVE of each variable is greater than the correlation coefficient of each variable, indicating that each variable has good discriminative validity.

This study took two natural classes from the same school and the same major offering the course of Audio and Video Program Production as the research samples. The number of students in both classes is 40. The students in the two classes had similar enrolment results and were taught by the same teacher. One of the classes served as a control group and another class acted as an experimental group.

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>REL</th>
<th>COM</th>
<th>SAT</th>
<th>AUT</th>
</tr>
</thead>
<tbody>
<tr>
<td>REL</td>
<td>0.881</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM</td>
<td>0.761</td>
<td>0.781</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAT</td>
<td>0.839</td>
<td>0.768</td>
<td>0.718</td>
<td></td>
</tr>
<tr>
<td>AUT</td>
<td>0.803</td>
<td>0.733</td>
<td>0.710</td>
<td>0.843</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Control Group</th>
<th>O1</th>
<th>O2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental Group</td>
<td>O1</td>
<td>X</td>
</tr>
</tbody>
</table>

Note: O1 Pre-test  
O2 Post-test  
X Teaching reform based on OBE

Figure 1. Procedure of the study

Figure 1 shows the procedure of the study. The students in the control group accepted the traditional teaching method. The experimental group carried out the teaching reform based on the OBE concept. The students in the experimental
group were told the overall task of the course before the class began, and the assignment of every class began to be arranged at the beginning of each class. The main content of the course was to tell the students how to better complete the assignment of this class. Students will work in groups of 2 to complete the assignment after class. In the next class, the teacher will comment on the students’ work and discuss with them how to do it better.

$O_1$ is the grade of the first assignment at the beginning of the course (The score is graded by multiple teachers and the average score is taken as the final grade). Students in each class are divided into three clusters based on their pre-test scores. Specifically, the higher third of students who scored were in the higher cluster, the middle third were in the medium cluster, and the lower third were in the lower cluster. And $X$ is the teaching process based on the OBE concept, lasting one semester. $O_2$ is the final test, which mainly includes three parts: (1) final score of the final assignment (The score is also graded by multiple teachers), (2) the Learning Satisfaction survey, and (3) survey of three dimensions of SDT.

**Data Analysis**

SPSS26.0 was used as a tool for data analysis by the following methods:

An independent sample t-test was used to measure the impact of OBE teaching reform on students’ Academic Achievement, Learning Satisfaction, and Self-determination.

Analysis of Covariance (ANCOVA) was used to re-validate the impact of OBE teaching reform on students’ Academic Achievement by taking into account students’ prior Academic Achievement (based on pre-test scores), i.e., to eliminate potential biases due to differences in students’ levels of prior Academic Achievement, thus producing more reliable results.

Analysis of Variance (ANOVA) was used to investigate the influence of OBE teaching reform on academic achievement, Learning Satisfaction and three dimensions of SDT of students with different learning bases (based on pre-test results).

**Results**

**Academic Achievement**

Regarding academic achievement, this study aimed to investigate whether the teaching reforms based on OBE contributed to improving student Academic
Investigation of the Impact of OBE-Based Teaching Reform

Achievement compared to the control group, and its impact on student clusters with different learning bases.

Figure 2 describes the test results of the experimental group and the control group in this study. The average scores of the pre-test in the control and the experimental groups are close to each other, the final scores of the experimental group show a greater improvement in Academic Achievement than the control group. In order to further verify this conclusion and clarify the influence of previous grades on final grades, this study used t-test and ANCOVA analysis to conduct an in-depth analysis of the data.

Table 3. Independent Sample T-test Results of Academic Achievement

<table>
<thead>
<tr>
<th>Assessment Tests</th>
<th>t(df)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test</td>
<td>0.111(78)</td>
</tr>
<tr>
<td>Post-test</td>
<td>-3.401(78) **</td>
</tr>
</tbody>
</table>

Note. **significant at the 0.01 level

Table 3 describes the results of the independent sample T-test for the Academic Achievement of the experimental and control groups. Levene method was used to test the homogeneity of variance, p>0.05, so the variance is homogeneous.

As shown in Table 3, there was no statistically significant difference between the scores of the two groups in the pre-test, indicating that the experimental and
control groups had similar cognitive levels at the beginning of the course. In a post-test at the end of the course, students in the experimental group scored higher than those in the control group, and there was a statistically significant difference between them.

With students’ pre-test scores as the covariable, ANCOVA was used to re-verify the research results to examine whether there was a statistically significant difference in improving students’ academic scores between the two groups after excluding the influence of students’ pre-test scores.

Table 4. Results of Covariance Analysis of Academic Achievement

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groups</td>
<td>1</td>
<td>33.828</td>
<td>0.000</td>
</tr>
<tr>
<td>Pre-test</td>
<td>1</td>
<td>139.621</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Table 4 shows that both students’ pre-test scores and the implementation of OBE teaching reform will impact students’ scores. In other words, after excluding the influence of pre-test scores, OBE teaching reform will still impact the improvement of students’ scores.

As for the impact of OBE teaching reform on students’ Academic Achievement in different clusters, this study studied the improvement of Academic Achievement based on the score difference between the pre-test and the post-test.

Figure 3. The Average Score Difference between the Pre-Test and Post-Test for Students in Different Clusters
As shown in Figure 3, after one semester’s study, the students’ scores have been improved. Specifically, in the control group, students with high pre-test scores improved their scores more, but those with medium and lower clusters improved their scores less. In contrast, all groups in the experimental group (regardless of higher, medium or lower clusters) showed greater improvement in the post-test.

According to the results of ANOVA, there were statistically significant differences in the score improvement of students with different clusters in the control group \([F(2,37)=19.174, p=0.000<0.01]\), and the score improvement of students in higher cluster was significantly higher. It may be because the course is a non-examination course and the medium and poor students have limited input into the course. There was no statistically significant difference in the scores of students from different clusters in the experimental group \([F(2,37)=2.413, p=0.103>0.01]\). In other words, OBE teaching reform makes the Academic Achievement improvement of students in medium and lower clusters almost equal to that of students in higher clusters, or it can make greater progress in the Academic Achievement of students in medium and lower clusters \((p=0.000<0.01)\).

**Learning Satisfaction**

With regard to Learning Satisfaction, this study aims to investigate whether OBE teaching reform will improve students’ Learning Satisfaction in the learning process, and whether students in different clusters will be affected to different degrees. Levene method was used to test the homogeneity of variance, \(p>0.05\), so the variance is homogeneous.

<table>
<thead>
<tr>
<th>Table 5. Independent Sample T-Test Results of Learning Satisfaction</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Groups</strong></td>
</tr>
<tr>
<td>CG</td>
</tr>
<tr>
<td>EG</td>
</tr>
<tr>
<td>(t(df))</td>
</tr>
</tbody>
</table>

Note. **significant at the 0.01 level, CG: Control Group, EG: Experimental Group

As shown in Table 5, there was a statistically significant difference in Learning Satisfaction between the experimental and control groups.

In order to reveal whether OBE teaching reform has a different impact on the student population of different clusters, this study adopted ANOVA to analyse the Learning Satisfaction of three clusters in the control group and the experimental
group, and adopted an independent sample t-test to analyse the Learning Satisfaction between different groups and the same clusters. No statistically significant difference was found.

**Three Dimensions of SDT**

Regarding the three dimensions of SDT, this study aims to investigate whether OBE teaching reform will improve students’ sense of Autonomy, Competence, and Relatedness in the learning process, and whether students in different clusters will be affected to varying degrees.

![Comparison of Average Scores in Three Dimensions of Student SDT](image)

**Figure 4.** Comparison of Average Scores in Three Dimensions of Student SDT

As shown in Figure 4, students in the experimental group scored higher on all three dimensions than those in the control group.

<table>
<thead>
<tr>
<th></th>
<th>Autonomy</th>
<th>Competence</th>
<th>Relatedness</th>
</tr>
</thead>
<tbody>
<tr>
<td>High clusters [t(df)]</td>
<td>-0.433(24)</td>
<td>-1.211(24)</td>
<td>-3.006(24) **</td>
</tr>
<tr>
<td>Medium clusters [t(df)]</td>
<td>-0.078(26)</td>
<td>-0.7501(26)</td>
<td>-1.159(26)</td>
</tr>
<tr>
<td>Low clusters [t(df)]</td>
<td>-0.964(24)</td>
<td>-0.323(24)</td>
<td>-2.115(24) *</td>
</tr>
</tbody>
</table>

**Table 6.** Independent Sample T-Test Results of the Three Dimensions of SDT of Same Cluster

Note. **significant at the 0.01 level, *significant at the 0.05 level**
As shown in Table 6, with respect to the three dimensions of SDT, the scores of students in the experimental group and the control group in the sense of Relatedness showed statistically significant differences. Therefore, it can be seen that implementing OBE enables students to better meet their needs in the sense of Relatedness. It may be because OBE enables students to actively participate in completing tasks. The division of labour and cooperation in this process, as well as the communication with teachers after completing tasks, significantly impact the sense of Relatedness, which is an important part of their inner feeling.

Finally, three dimensions of SDT were analysed for students in different groups and the same cluster. The results showed a statistically significant difference between higher and lower clusters’ scores on Relatedness. It indicates that, compared with students with a medium learning foundation, OBE can significantly improve the sense of Relatedness of students with good and poor Academic Achievements.

Conclusions

This paper analyses the influence of OBE-based teaching reform of Audio and Video Program Production on students’ learning experience and the following conclusions were obtained:

1. In terms of the improvement of Academic Achievement, the implementation of OBE can benefit students as a whole, especially students with medium and poor Academic Achievement can achieve more significant improvement in Academic Achievement.

2. OBE can improve students’ Learning Satisfaction with the course. It proves that OBE creates a more attractive learning environment for students, thus increasing their Learning Satisfaction, which helps students to stay motivated during the course study.

3. OBE can satisfy the intrinsic motivation needs of students in the sense of Relatedness, especially for students with higher and lower grades. It may be because both higher and lower performers tend to value collaborative activity processes with their peers. In the traditional teaching process, these practical activities in cooperation with classmates are often only a minor part of classroom activities, and the relevant experience of students is not obvious. However, OBE makes collaborative tasks a major part of the curriculum and makes it clear that all students need to be actively involved. The higher performers enjoyed helping others, and the lower performers found
that the process contributed to their ability and achievement improvement, so their level of Relatedness was significantly higher.

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References


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