

Learning Motivation, Class Engagement, and Academic Performance in Mixed-Grade Classes at Wenzhou-Kean University

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The European Conference on Arts & Humanities 2024
Official Conference Proceedings

Abstract

Many foreign elementary schools or universities apply the mixed-grade class model while having a lecture, which means students from different grades are taught in one section. This teaching model is rare in China but common at Wenzhou-Kean University. Learning motivation and class engagement are two significant factors that influence students' academic performance. This study aims to investigate the correlation between learning motivation, class engagement, and students' academic performance in mixed-grade classes and determine whether students' high learning motivation and class engagement could predict good academic performance. This quantitative study collected 169 students' responses from Wenzhou-Kean University, using a validated questionnaire to evaluate students' learning motivation, class engagement, and academic performance. This study uses convenience sampling to collect data and analyze it by SPSS. Pearson correlation reveals that learning motivation and class engagement positively correlate with students' academic performance in general and among students of different grades. The Linear regression found that learning motivation and class engagement could predict academic performance of different ages. One-way ANOVA finds no significant differences among different year grades regarding the three main variables, but this hypothesis should be retained due to the limitation of lack of sample. With these results, students can have a clearer insight and a comprehensive understanding of improving their academic performance in a mixed-grade class. This study also has significance for educators in China, as it can provide some practical teaching concerns and try different educational models while teaching mixed-grade classes.

Keywords: Learning Motivation, Class Engagement, Academic Performance, Mixed-Grade Class, Education Mode

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1. Introduction

Nowadays some universities apply the mixed-grade class model, which means there are students from different grades in a single section and taught by one professor. That is an obvious and general phenomenon in Wenzhou-Kean University when there are lots of courses that apply this model. But will the performance students from different grades be the same? Bekiryazıcı (2015) pointed out that it might be difficult for teachers to teach as students from different levels have different abilities, backgrounds, and interests. Also, as they are students from different grades, they might have some difference in learning experience, learning ability and self-awareness etc. They can have different level of learning ability at the same time. Also, will the learning motivation and academic performance of students be different when the grades of students are different? Within class engagement, academic performance, and learning motivation, do those variables have any connections and relationships? Quail and Smyth (2014) had mentioned that the impact of mixed-grade class on different student's outcome in academic and social aspects were ignored. It is important to figure out these questions.

As Cornish (2018) claimed 'Mixed-grade' and 'mixed-age' are broad terms for referring to classes with students who are not all the same or a very similar age. It is similar but different from what is referred to here. Students don't have to be of different ages, but they should be in different grades. For example, in Wenzhou-Kean University there will be classes have sophomore, junior, and senior students all together. The learning motivation and academic performance are not sure. Also, the kind of class may affect those variables.

In order to fill the knowledge gap, our research group investigated students who currently take or have taken a mixed-grade class at Wenzhou-Kean University. When most students here have this experience, it is convenient to collect data. After analyzing data those unknown questions can be figured out.

Relevant Items

Learning Motivation. Some studies have found there are some relationships between learning motivation and academic performance. Kusurkar et al. (2012) collected data from 383 medical students of VU University Medical Center Amsterdam, found that learning motivation would affect academic performance positively when related to average grade points. Pascoe et al. (2018) also thought "Intrinsic motivation is associated with better academic performance". Salili et al. (2001) mentioned that culture and context both have influence on student motivation and learning.

Class Engagement. Konold et al. (2018) tested through multilevel multi-informant structural model on a sample of 60441 students and 11442 teachers in 298 high schools, found that student academic achievement is directly related to student engagement, and it can be an intervening factor. Finn & Zimmer (2012) also emphasized the importance of student engagement in academic achievement, while engagement is composed by many factors in behaviour and psychology.

Academic Performance. From previous literature it can be found that academic performance would have relationships with learning motivation and class engagement. They will be more factors than that. Li & Qiu (2018) mentioned that family's educational background affect students academic achievement. Blazar & Kraft (2016) also found that teacher and teacher's teaching effort have impact on student learning outcomes.

1.1 Statement of the Problems

This study aims to investigate how students from various grades perform academically, their learning motivation and class engagement in mixed-grade courses at Wenzhou-Kean University. Specifically, this study will be based on the following research questions:

- 1.1.1 What is the profile of students in mixed-grade classes?
- 1.1.2 What's the relationship between student's academic performance and class engagement in mixed-grade classes?
- 1.1.3 What's the relationship between student's motivation level and academic performance in mixed-grade classes?
- 1.1.4 What's the relationship between student's motivation level and class engagement in mixed-grade classes?
- 1.1.5 Does students' motivation level predict academic performance in mixed-grade classes?
- 1.1.6 Does students' class engagement predict academic performance in mixed-grade classes?
- 1.1.7 Is there a difference in class engagement, academic performance, and motivational level among students of different grades?

1.2 Research Objectives

This study aims:

- 1.2.1 To explore the profile of students in mixed-grade classes.
- 1.2.2 To find out the correlation between students' academic performance and class engagement in mixed-grade classes.
- 1.2.3 To explore the correlation between student's motivation level and academic performance in mixed-grade classes.
- 1.2.4 To identify the correlation between students' motivation level and class engagement in mixed-grade classes.
- 1.2.5 To search students' motivation levels to predict academic performance in mixed-grade classes.
- 1.2.6 To verify if students' class engagement predicts academic performance in mixed-grade classes.
- 1.2.7 To determine the difference in class engagement, academic performance, and motivational level among students of different grades.

1.3 Hypothesis

H01: There will be no significant correlation between the student's class engagement and academic performance in the mixed-grade class.

H02: There will be no significant correlation between students' academic performance and motivation level.

H03: There will be no significant correlation between the student's class engagement and motivation level.

H04: Students' learning motivation can't predict their academic performance in the mixed-grade class.

H05: Students' class engagement can't predict academic performance in mixed-grade classes.

H06: There is no significant difference in class engagement, academic performance, and learning motivation level among students of different grade in mixed-grade class.

1.4 Significance of the Study

This study is meaningful to a large group of people, like students, professors, and educational institutions. This study explores the underlying correlations between class engagement, motivational levels, and academic performance. Students, especially students who are already in a mixed-grade class, can refer to these correlations to optimize their learning preferences. This study provides new methods to improve students' academic performance, like increasing class engagement and promoting learning motivation. Professors, especially professors who are already teaching a mixed-grade class, can refer to this study to change their teaching methods to improve the overall teaching quality and generate the most suitable methods for students of all grades. For educational institutions, like universities, they can choose whether to apply the mixed-grade classes method according to the result of our study. If mixed-grade classes have a positive influence on students' academic performance, it means it can be generalized to be more widely used.

1.5 Definition of Terms

Mixed-Grade Classes. The same as multi-age classroom or composite classes. Students of different ages from different grades are gathered into one classroom and taught by one teacher.

Learning Motivation. “is often defined as being intrinsic, where learners are interested in the course content, or extrinsic, where learners are interested in earning a course grade or credit” (Styer, 2009). In this study, we use Diversity of Strategies for Motivation in Learning (DSML) to measure students' learning motivation.

Class Engagement. “refers to the degree of attention, curiosity, interest, optimism, and passion that students show when they are learning or being taught, which extends to the level of motivation they have to learn and progress in their education” (Great Schools Partnership, 2016).

Academic Performance. “is the measurement of student achievement across various academic subjects. Teachers and education officials typically measure achievement using classroom performance, graduation rates, and results from standardized tests” (Ballotpedia, 2022).

2. Research Methodology

2.1 Research Design

According to the research problem, this study aims to investigate how students from various grades perform academically, their learning motivation and class engagement in mixed-grade courses at Wenzhou-Kean University. This study will explore students' profiles in mixed-grade classes, the correlation between students' academic performance and class engagement, the correlation between students' motivation levels and academic performance in mixed-grade courses, and the correlation between students' motivation levels and class engagement. This study inserts 5 Null Hypothesis:

H01: There will be no significant correlation between the student's class engagement and

academic performance in the mixed-grade class; H02: There will be no significant correlation between students' academic performance and motivation level; H03: There will be no significant correlation between the student's class engagement and motivation level; H04: Students' learning motivation can't predict their academic performance in the mixed-grade class; H05: Students' class engagement can't predict academic performance in mixed-grade classes. To test the Null Hypothesis, this study will utilize a quantitative research method to examine the correlations and regressions among variables. To explain the correlations and regression of these variables, the nature of this study is explanatory research.

2.2 Respondent and Sampling

To collect data quickly and comprehensively from Wenzhou-Kean University students, this study allocates an online standardized questionnaire to collect data. This questionnaire lasted a month to collect data from students from different year levels, course levels, and colleges. This study has collected 170 respondents' answers. The target population of this study is students at Wenzhou-Kean University. The sample in this study is randomly selected from Wenzhou-Kean University, and the sampling method is randomly distributed online.

2.3 Research Instruments

This study utilized a standardized and validated online questionnaire involving four parts: respondents' profiles, academic performance assessment, class engagement assessment, and students' learning motivation assessment. The questionnaire consists of closed-end questions, including multiple-choice questions and scale-choice questions. The first part of the questionnaire collects respondents' basic information regarding their major, year grade, and course level. The second part of the questionnaire examines students' academic performance levels using the Likert scale. The third part is class engagement level measurement, and the fourth is learning motivation level measurement.

2.4 Data Analysis

This study aims to reach six research objectives by adopting descriptive statistics to analyze respondents' profiles in mixed-grade classes (objective 1) and utilizing inferential statistics to find out the correlation between students' academic performance and class engagement in mixed-grade courses to determine the relationship between students' motivation level and academic performance in mixed-grade courses, to identify the relationship between students' motivation level and class engagement in mixed-grade classes (objectives 2-4). Besides, this study will also utilize regression to search whether students' motivation levels predict academic performance in mixed-grade classes and to verify if students' class engagement predicts academic performance in mixed-grade classes (objectives 5 and 6). The online questionnaire was randomly allocated among different WeChat groups, and researchers also applied collective administration to collect data. The researcher obtains captive students from GE, Business Law, and Management Science courses.

2.5 Establishing Quality

The degree to which data functions for its intended purpose is known as data quality. This implies that the information should produce the desired result (Sagacity, 2023). Meanwhile, high-quality data serves as the basis for study and the secret to its eventual production. This

study utilized simple random sampling to reduce sample error as much as feasible. This study's research instruments include a standardized, validated questionnaire to ensure validity. The survey questions guarantee that respondents won't learn about the outcome. In terms of the questionnaire's substance, it is easily comprehensible, and the questions' profundity gradually increases. The content of this questionnaire is straightforward and provides both Chinese and English interpretations.

2.6 Limitations of the Study

The main limitation of this study is the low response rate of students since it only collected 170 respondents' answers. The results' outcome lacks accuracy in generalizing the target population. Since this study applies a quantitative research method and uses closed-ended questions, it lacks the opportunity for spontaneous responses. Moreover, this study used collective administration to collect data, so the respondents would fill in the answers quickly, which may impact the results' accuracy.

3. Results and Discussion

This chapter will present data analysis and results based on 169 respondents' answers; SPSS analyzes these data, making the data valid and accurate.

3.1 The Basic Information of the Respondents

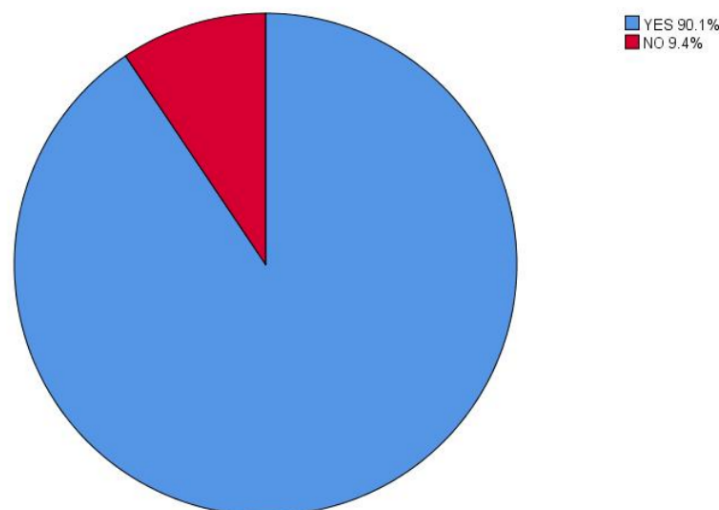
Table 1: Descriptive of Respondents' Profile

Variables	Category	Frequency	Percentage
school	College of Business & Public Management	121	71.2%
	College of Liberal Arts	32	18.8%
	Michael Graves College	11	6.5%
	College of Science, Mathematics and Technology	2	1.2%
	Others	3	1.8%
Year-level	Freshman	34	20.0%
	Sophomore	70	41.2%
	Junior	36	21.2%
	Senior	29	17.1%
Gender	Male	61	35.9%
	Female	103	60.6%
	Others	5	2.9%
Cumulative GPA	2.0-2.5	11	6.5%
	2.6-3.0	15	8.8%
	3.1-3.5	38	22.4%
	3.6-4.0	105	61.8%

This study has collected 169 students' responses; among these respondents, as can be seen in Table 1 71.2% of the students are business majors, which could represent most students regarding the major category. This study emphasized different year-grade students' learning motivation, academic performance, and class engagement level, so the data or year level is essential. Among the 169 respondents, 20.0% are freshmen, 41.2% are sophomores, 21.2% are juniors, 17.1% are seniors. Sophomore students dominate the sample, and sophomore students could take courses with higher and lower-year grades. This study involves 35.9% male respondents and 60.6% female respondents. GPA (Grade Point Average) is one of the

indicators for evaluating students' academic performance in this study. The majority of respondents, 61.8%, have a GPA between 3.6 and 4.0 (one decimal place), 22.4% have a GPA between 3.1 and 3.5, and 15.3% have a GPA lower than 3.0.

Figure 1: Percentage of Respondents' Teaching Mode



The mixed-grade class teaching form can be found at Wenzhou-Kean University, and Figure 1 shows that among 169 respondents, 90.1% have taken mixed-grade classes during their previous year in WKU. 9.4% of respondents have not taken the mixed-grade course currently. This could prove that mixed-grade class teaching mode is common and general in WKU, ranging from general education to specialized courses.

3.2 Descriptive of Respondents' Class Engagement, Academic Performance, and Learning Motivation

Table 2: Descriptive of Respondents' Class Engagement, Academic Performance, and Learning Motivation

	N	Mean	Std. deviation	Interpretation
Academic performance	169	3.69	.64	Average
Learning motivation	169	3.53	.54	Average
Class engagement	169	3.83	.63	Average
Valid N	169			

As shown in Table 2, N=169 respondents' academic performance, class engagement, and learning motivation levels are interpreted as average with the mean=3.69 and standard deviation=.64 regarding academic performance, mean=3.83 and standard deviation=.63 regarding class engagement level, and mean=3.53 and standard deviation =.54 regarding learning motivation. These three indicators show respondents' average level in these three dimensions.

3.3 Correlation Between Class Engagement and Academic Performance

Table 3: Correlation of Respondents' Class Engagement and Academic Performance

		Academic performance	Class engagement
Academic performance	Pearson Correlation	1	.776**
	Sig.(2-tailed)		.000
	N	169	169

** . Correlation is significant at the 0.01 level (2-tailed).

Table 3 indicates that the two-tailed Pearson correlation results suggested that the two variables, respondents' academic performance and class engagement, have a strong positive relationship, $r(168) = .776$, $p < .01$. Therefore, the null hypothesis one can be rejected. A strong positive correlation exists between students' academic performance and class engagement in the mixed-grade class.

Table 4: Correlation of Academic Performance and Class Engagement among Different Grades

Categorical variables		The Pearson correlation between performance and engagement	Sig. (2-tailed)	N
The year-grades of respondents	Freshman	.771**	.000	34
	Sophomore	.793**	.000	70
	Junior	.784**	.000	36
	Senior	.754**	.000	29

** . Correlation is significant at the 0.01 level (2-tailed).

Table 4 demonstrates that the relationship among students of different grades is different, though generally, there is a strong relationship in the mixed-grade class. The two-tailed Pearson Correlation indicates that the correlation among sophomore students is the strongest with $r(69) = .793$, $p < .05$, and senior students have the weakest correlation with $r(28) = .754$, $p < .05$. Selime (2014) has pointed out that the students and their feeling of belonging, behavioral involvement, and cognitive engagement are related to academic performance. The study also argued that higher quality learning outcomes were correlated with a sense of belonging which could affect the outcome of class engagement (Selime, 2014). Sophomore and junior students are usually more active in class since they have a strong intrinsic motivation to get a better grade and have a relatively strong sense of belonging to the university compared to the freshman and senior students.

3.4 Correlation Between Learning Motivation and Academic Performance

Table 5: Correlation of Respondents' Learning Motivation and Academic Performance

		Learning motivation	Academic performance
Learning motivation	Pearson Correlation	1	.455**
	Sig.(2-tailed)		.000
	N	169	169

** . Correlation is significant at the 0.01 level (2-tailed).

Table 5 demonstrated that the two-tailed Pearson correlation results suggested that the two variables, respondents' academic performance and learning motivation, have a moderate positive relationship, $r(168) = .455$, $p < .01$. Therefore, the null hypothesis two can be rejected. A moderate positive correlation exists between students' academic performance and learning motivation in the mixed-grade class.

Table 6: Correlation of Academic Performance and Learning Motivation Among Different Grades

Categorical variables		The Pearson correlation between performance and academic learning motivation	Sig. (2-tailed)	N
The year-grades of respondents	Freshman	.352*	.041	34
	Sophomore	.378**	.001	70
	Junior	.595**	.000	36
	Senior	.534**	.000	29

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Table 6 shows that the correlation among grade students gradually increased from freshmen to seniors. The one-tailed Pearson correlation shows that freshmen have a relatively weak correlation at $r(33) = .352$, but juniors have a relatively significant strong correlation at $r(35) = .595$. The different degrees of correlation could result in several factors, including the different usage of intrinsic and extrinsic motivation, students' learning target, and difficulty of course level since most juniors would take higher-level courses. At the same time, freshmen mainly emphasized language learning in their first year.

3.5 Differences Among Different Year Grade Students

Table 7: Difference of Academic Performance Among Respondents ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Academic performance					
Between Groups	.926	3	.309	.742	.529
Within Groups	68.694	165	.416		
Total	69.621	168			
Learning motivation					
Between Groups	2.038	3	.679	2.373	.072
Within Groups	47.241	165	.286		
Total	49.280	168			
Class engagement					
Between Groups	1.891	3	.630	1.555	.202
Within Groups	66.870	165	.405		
Total	68.761	168			

Table 7 reveals that the results of one-way ANOVA did not show a significant omnibus difference in the academic performance, learning motivation, and class engagement of the different year- grades at $F(3,165) = .742, p > .05$ regarding academic performance, $F(3,165) = 2.373, p > .05$ regarding learning motivation and $F(3,165) = 1.555, p > .05$ regarding class engagement, which could reflect that students from freshmen to seniors have similar academic performance, learning motivation, and class engagement.

3.6 The Correlation Between Students' Learning Motivation Level and Class Engagement

Table 8: The Correlation Between Students' Motivation Level and Class Engagement

		Learning motivation	Class engagement
Learning motivation	Pearson Correlation	1	.587**
	Sig.(2-tailed)		.000
	N	169	169

As shown in Table 8, it demonstrated that the two-tailed Pearson correlation results suggested that the two variables, respondents' class engagement and learning motivation, have a significant positive relationship, $r(168) = .587, p < .01$. Therefore, the null hypothesis three can be rejected. A significant positive correlation exists between students' class engagement and learning motivation in the mixed-grade class.

Table 9: Correlation of Class Engagement and Learning Motivation among Different Grades

Categorical variables		The Pearson correlation between class engagement and learning motivation	Sig. (2-tailed)	N
The year-grades of respondents	Freshman	.623**	.000	34
	Sophomore	.403**	.001	70
	Junior	.713**	.000	36
	Senior	.694**	.000	29

** . Correlation is significant at the 0.01 level (2-tailed).

Table 9 shows that juniors have the highest significance level in the correlation between learning motivation and class engagement, with a value of $r(35) = .713$. Also, it can be found that sophomores have the lowest significant level in the correlation between learning motivation and class engagement, which is $r(69) = .403$. It can be inferred that juniors have the most relevant relationship between learning motivation and class engagement among the four grades of students. In contrast, the sophomore has the least relevant relationship between learning motivation and class engagement. And as Lei et al. (2024) found, “Learning motivation had a significant positive effect on learning engagement.” They also mention that learning motivation had a partial mediation effect on learning engagement, while different personality traits might play a role in affecting the relationship between learning motivation and learning effectiveness (Lei et al., 2024). They have similar findings while deeply digging into the reasons behind them. When talking about students in WKU, junior and senior students might have relatively higher expectations and futures, so they have the tightest relationship in learning motivation and class engagement.

3.7 Whether Student’s Learning Motivation Predicts Academic Performance in Mixed-Grade Classes

Table 10: Regression Model of Learning Motivation and Academic Performance

Model Summary				
Model	R	R Square	Adjusted R	Std. Error of the Estimate
1	.455 ^a	.207	.203	.57487

a. Predictors: (Constant), Learning Motivation

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	14.432	1	14.432	43.670	.000 ^b
	Residual	55.189	167	.330		
	Total	69.621	168			

a. Dependent Variable: Academic performance

b. Predictors: (Constant), Learning motivation

Coefficients ^a					
Unstandardized Coefficients				Standardized Coefficients Beta	t Sig.
Model		B	Std. Error		
1	(Constant)	1.780	.293		6.073 .000
	LM	.541	.082	.455	6.608 .000

a. Dependent Variable: Academic performance

From these tables, it can be found that a linear regression was calculated to see if learning motivation (IV) predicts academic performance (DV) ($\beta=.541$). A significant regression equation was found: $F(1,167)=43.670$, $p<.05$ with an $R^2=.26$. Learning motivation can predict academic performance in mixed-grade classes.

3.8 Whether Student's Class Engagement Predicts Academic Performance in Mixed-Grade Classes

Table 11: Regression Model of Class Engagement and Academic Performance

Model Summary				
Model	R	R Square	Adjusted R	Std. Error of the Estimate
1	.776 ^a	.603	.600	.40704

a. Predictors: (Constant), Learning Motivation

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	41.952	1	41.952	253.210	.000 ^b
	Residual	27.669	167	.166		
	Total	69.621	168			

a. Dependent Variable: Academic Performance

b. Predictors: (Constant), Class Engagement

Coefficients ^a					
Unstandardized Coefficients				Standardized Coefficients Beta	t Sig.
Model		B	Std. Error		
1	(Constant)	.702	.191		3.685 .000
	CE	.781	.049	.776	15.913 .000

a. Dependent Variable: Academic performance

From these tables, it can be found that a linear regression was calculated to see if class engagement (IV) predicts academic performance (DV) ($\beta=.776$). A significant regression equation was found $F(1,167)=253.210$, $p<.05$ with an $R^2=.603$. Therefore, class engagement can predict academic performance. Lei et al. (2018) argued that a strong and positive relationship was found between student engagement and academic achievement. By meta-analysis, the relationship is affected by the method of reporting engagement, cultural value, and gender (Lei et al., 2018).

3.9 Is There a Difference in Class Engagement, Academic Performance, and Motivational Level Among Students of Different Grades

Table 12: The Mean Difference in Class Engagement, Academic Performance, and Motivational Level Among Students of Different Grades

		ANOVA				
		Sum of Squares	df	Mean Square	F	Sig.
AP	Between groups	.926	3	.309	.742	.529
	Within groups	68.694	165	.416		
	Total	69.621	168			
CE	Between groups	1.891	3	.63	1.555	.202
	Within groups	66.87	165	.405		
	Total	68.761	168			
LM	Between groups	2.038	3	.679	2.373	.072
	Within groups	47.241	165	.286		
	Total	49.28	168			

Results of one-way ANOVA show that there was no significant overall difference in academic performance of different grades' students at $F(3,165) = .742, p > .05$. There was not difference in class engagement of different grades' students at $F(3,165) = 1.55, p > .05$. Last but not least, there was not difference in learning motivation of different grades' students at $F(3,165) = 2.373, p > .05$. The result indicated that mix-grade classes won't influence students' academic performance, class engagement and learning motivation, whatever grades they are.

4. Summary, Conclusion, and Recommendation

4.1 Summary

For research question 1, as for the profile of students in mixed-grade classes, we've got 169 respondents and most of them have taken mixed-grade courses. About half of our participants are sophomores and more than half of them have a relatively high GPA (between 3.6 and 4.0).

For research question 2, there is a relationship between student's academic performance and class engagement in mixed-grade classes.

For research question 3, students' motivation levels positively correlate with their academic performance in mixed-grade classes.

For research question 4, students' motivation level and class engagement are also interacting directly. Students who have higher motivation are more willing to engage in a mixed-grade class, no matter what grades the students are.

For research question 5, students' motivation level can predict academic performance in mixed-grade classes. If students have a higher learning motivation, in return they will receive a better GPA. If students do not have much learning motivation, they are more likely to get lower grades.

For research question 6, students' class engagement can predict academic performance in mixed-grade classes. If students are more engaged in class, they tend to have a better GPA and more outstanding performance. it applies to all grade students.

For research question 7, there is no difference in class engagement, academic performance, and motivational level among students of different grades, which means mix-grade classes won't influence students learning state.

4.2 Conclusion

The hypothesis of this research is there are no relationships between students' class engagement, academic performance, and motivational level in mixed-grade classes.

According to the result of the Pearson correlation analysis, we found that there is a relationship between these three factors, and they are positively correlated. Both a high level of learning motivation and more class engagement can contribute to better academic performance.

Meanwhile, high learning motivation results in more class engagement. Furthermore, academic performance has a mutual effect with learning motivation and class engagement which means the higher academic performance, the higher learning motivation, and the more class engagement.

Last but not least, there is no difference in class engagement, academic performance, and motivational level among students of different grades, which means mixed-grade classes will not bring some educational difference to students.

4.3 Recommendation

Firstly, the result as mentioned above indicated that there are positive relationships between students' class engagement, academic performance, and motivational level in mixed-grade classes. Consequently, on condition that some students want to improve their GPA, they can improve their learning motivation, by setting up some goals and giving themselves some rewards. they can also do better by participating more in mixed-grades classes, like answering professors' questions positively and concentrating more in the classes.

Secondly, this study can dispel the misgivings of some students who want to join mixed- grade classes. Some low-grade students may feel pressure to take classes with higher-grade students with more experience and better English levels. With the result of our study, the lower grade students can choose mixed-grade classes relievedly as the class will not influence students' class engagement, academic performance, and motivational level.

It can also provide some advice for professors who teach mixed-grade classes. Sometimes the professor may be concerned that there are different grades of students in a classroom which means they have different English and knowledge levels. With the result of our study, they no longer need to worry as we found out that although students are from different grades, it doesn't influence their learning outcomes.

However, there is a remaining question. While we were analyzing the data, we discovered that the juniors' learning motivation was slightly higher than the sophomores. We are not sure if the difference in learning motivation of sophomores and juniors in mix-grade class is caused by

the mix-grade class, or rooted by their grades. It is common for juniors to have a higher learning motivation than sophomores, as they are closer to graduation and have more pressure than sophomores. Maybe in the future, we can do some interviews and determine the reason for the higher learning motivation of juniors.

Appendix : Questionnaire About Learning Motivation in Mixed-Grade Classes

I voluntarily agree to participate in this research study. I understand that even if I agree to participate now, I can withdraw at any time or refuse to answer any question without any consequences of any kind.

我自愿同意参加这项研究。我知道，即使我现在同意参加，我也可以随时退出或拒绝回答任何问题，而不会产生任何后果。

A: Profile

1. What is your major?
 - A. Finance, Economics, Marketing, Accounting etc from CBPM
 - B. Psychology, English, Communication from CLA
 - C. Biology, Chemistry, Physics etc from CSMT
 - D. Architecture, Design, etc from MGC
2. What is your year grade?
 - A. Freshman
 - B. Sophomore
 - C. Junior
 - D. Senior
3. What is the professional course level you have taken this semester?
 - A. Lower level (1000-2000)
 - B. Higher-level (3000-4000)
4. Do you have mixed-grade courses this semester? If YES, answer the following questions.
 - A. YES
 - B. NO

B: Academic performance:(1-5:SA-DA)

1. I made myself ready in all my subjects this semester in the class.
2. I pay attention and listen during every discussion in class.
3. I want to get good grades in professional courses.
4. I actively participate in every discussion.
5. I start papers and projects as soon as they are assigned.
6. I enjoy homework and activities because they help me improve my skills in the course.
7. I exert more effort when I do difficult assignments.
8. Solving problems is a useful hobby for me.

C: Class engagement: (1-5:SA-DA)

9. I feel I can take the responsibility of my own learning.
10. I have become more confident of my ability to pursue further learning.
11. I have improved my ability to use knowledge to solve problems in my field of study.

12. In my time at university I have improved my ability to convey ideas.
13. I have learned to be an effective team or group member.
14. I manage to complete the requirements of the program without feeling unduly stressed.
15. I find teaching staff helpful when asked questions.
16. I feel a strong sense of belonging to my class group.

D: Learning motivation:

1- Please indicate to which extent the following statement is true of you: 2-1-not very true of me to 5-very true of me

17. I like material that really challenges me, even if it is difficult to learn.
18. I sometimes procrastinate to the extent that it negatively impacts my work
19. I think I will be able to use what I learn in courses elsewhere in life.
20. I put less effort into studying for classes that I don't enjoy.
21. My goal is to do just enough to pass my courses.
22. I am confident that I can understand the basic concepts in courses.
23. I take course material at face value and don't question it further.
24. I am personally interested in the content of my courses.
25. I go back to previously made notes and readings to refresh my understanding of them.
26. If I get confused when studying, I take steps to clarify any misunderstandings
27. I treat the course material as a starting point and try to develop my own ideas about it

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