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Original Paper

The Effect of Opposite-Gender Preference in Teachers' Grading

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Abstract

Higher education plays an important role in passing on of knowledge, and grading from teachers to students may significantly affect these students' development in the future. Gender preference has been extensively explored in various domains. A common question is whether gender preference exists in teachers' grading. If so, would teachers give students of the opposite gender a higher grade without noticing this opposite-gender preference? A survey was conducted between 2020 and 2021, and a total of 1,604 student scores were collected. The independent samples t-test and ANOVA were performed to test the collected data. This study found that first, female teachers, compared to male teachers, gave significantly higher scores ($p < 0.000$). Second, male teachers' grading was not affected by the gender of their students ($p = 0.067$). Third, female teachers gave male students, compared to female students, significantly higher scores ($p = 0.003$). These preliminary findings suggest that opposite-gender preference may exist. However, this study only collected simples from teachers and students from the department of design, and therefore, it is not clear yet whether the above preference can be observed in all education settings.

Keywords

Gender Preference, Opposite-Gender, and Teachers' Grading

1. Introduction

Higher education plays an important role in passing on of knowledge, and the grades of college students represent their professional competency according to their teachers. College grades in fact affect students' application for jobs or admission to graduate schools. Fairness in grading has been extensively investigated in research (Song, 2018). Helms (2006) explored fairness in grading among different ethnic groups. Ghanbari (2019) examined the grading standard of the writing assessment for

English as a Foreign Language (EFL). Yoo et al. (2019) adopted a cross-group design to investigate fairness in English proficiency grading. De Mena-Ramos et al. (2019) studied differences in knowledge in different academic disciplines. All the studies above showed that regardless of the domain, fairness is an issue in grading that needs to be addressed.

Aside from fairness of grading, gender is another widely explored topic. In the past, Asian countries are patriarchal; it was, for example, hard for women to get promoted in the workplace. As a result, gender studies are important for achieving gender equality. Lin (2019) pointed out that teachers' attitude toward gender is affected by their own gender. Nomura et al. (2022) investigated the traditional concepts of gender and the anticipated gender characteristics. Many studies have shown that gender inclusiveness is critical in group collaboration, and gender stereotypes are likely to compromise gender roles in society (Chance, 2021; Carbajal-Obando et al., 2022).

There are experts who have examined if gender influences students' learning performance and the association between gender and teaching. Chen (2020) suggested that females and males are good at different subjects. That is, in certain disciplines, females perform better than their male counterparts, as reflected by grades. Henderson (2015) conducted his investigation in the disciplines of mathematics and found that males performed better than females in math. Therefore, each gender is likely to have its own strengths and weakness depending on the academic discipline. Gary-Maple (2021) demonstrated that gender differences exist in mathematics as well.

In terms of gender bias, it has been extensively studied in various fields. Lin (2019) investigated gender-related issues in the military and found that females receive more attention than males do in the force. Evans (1997) found that in nursing, males' position were often higher than females', suggesting that in nursing, males may enjoy more advantages because of their gender than their female counterparts do. There are also studies showing that females do not get a better job or higher income as they receive more and more education. The barriers of 'doing gender' also prevent a fully egalitarian division of roles (Garcia-Roman, 2021).

In terms of education, fairness is an important principle when teachers grade their students. However, does the gender of students affect a teacher's grading of the students? If gender preference exists, are teachers may aware of giving students of the opposite gender a higher grade? This study examines opposite-gender preference in teachers' grading. The findings can provide educators some useful information.

2. Method

This study examined whether teachers grade their students consistently regardless of the gender of the students. Both male and female teachers were asked to provide scores of their students for this study to test the effect of opposite-gender preference on students' scores. In this study, the independent variable is whether the students and the teacher who graded them are of the same or the opposite gender. The dependent variable is student scores. The control variable is the college students at technology college.

2.1 Subjects

This study invited four teachers of the department of visual communication design: two males and two females. These four teachers in average had taught for more than ten years. Their average teaching response was greater than 4.0 (5-point Likert Scale; 1 the lowest point, while 5 the highest). One of the four teachers had been awarded for teaching excellence numerous times. This study selected teachers who were objective and stable to eliminate grading bias of personal reasons.

2.2 Samples

This study asked the four above-mentioned teachers to provide their students' scores. From 2020 to 2021, they had generated 1,604 scores for visual communication design students. These scores were generated for design, laws, management, and humanities related courses. There were 426 scores from male students and 1,178 scores from female students.

2.3 Statistics

This study assessed the data using the independent samples t-test and ANOVA. The independent samples t-test and ANOVA were chosen because the objective of this study is to examine if there is any gender difference in students' scores.

3. Result

3.1 Descriptive statistics

There are four basic variables: gender, the semester, the academic system, and the field of the course. A total of 1,604 student scores were collected and used. In terms of gender, there were 426 scores from male students (26.56%) and 1,178 scores from female students (73.44%). In terms of the semester, 54.49% of the scores were from the fall semester, while 45.51% of the scores were from the spring semester. As for the variable of the academic system, scores from the day department accounted for 94.26% of all scores collected, while scores from the night department accounted for 3.93%. Last, for the field of the course, design accounted for 75.68% of the scores, humanities accounted for 4.55%, law accounted for 12.16%, and management accounted for 7.61%. See Table 1.

Table 1. Descriptive Statistics of Study Variables

No.	Items	Sub-items	N	%
1	Gender (Students)	Male	426	25.56
		Female	1178	73.44
2	Semester	Fall	874	54.49
		Spring	730	45.51
3	Academic system	Day department	1512	94.26
		Night department	63	3.93
		Graduate School	29	1.81

4	Field of the course	Design	1214	75.68
		Humanities	73	4.55
		Law	195	12.16
		Management	122	7.61

3.2 Statistical tests for basic variables

As shown in Table 1, this study performed the independent samples t-test and ANOVA on gender, the semester, the academic system, and the field of the course these four variables in sequence.

3.2.1 Gender

In terms of the gender variable this study found a significant difference between male and female students in the average scores ($p < 0.000$). Female students' average score (83.299) was significantly higher than male students' score (78.730). Moreover, the standard deviation (SD) of female students' scores was smaller than of male students'. This finding revealed that female students' learning result was more stable than male students'. See Table 2.

Table 2. Test on the Effect of Gender

Gender (Students)	Mean	Standard Deviation	T-Value	P-Value	Comparison Result
Male	78.730	13.667	-	-	-
Female	83.299	9.130	-	-	-
Independent Samples T-Test	-	-	-6.403	0.000	Female > Male

3.2.2 Semester

In terms of the semester variable, this study found no significant difference between the fall semester and the spring semester in the average scores ($p = 0.277$). Moreover, their SDs were close. See Table 3.

Table 3. Test on the Effect of Semester

Semester	Mean	Standard Deviation	T-Value	P-Value	Comparison Result
Fall	81.820	10.263	-	-	-
Spring	82.404	11.229	-	-	-
Independent Samples T-Test	-	-	-1.087	0.277	No significant

3.2.3 Academic system

For the academic system variable, this study found a significant difference between the day department, the night department, and the graduate school in the average scores ($p < 0.000$). From the highest to the lowest, it was the graduate School (87.965), the day department (82.272), and the night department (75.888). It was also found that the higher the average score was, the lower the SD was. For example, the graduate school had the highest average, but its SD was the lowest (4.460). As for the night department, it had the lowest average score, but its SD was the highest (12.940). See Table 4.

Table 4. Test on the Effect of Academic System

Academic System	Mean	Standard Deviation	T-Value	P-Value	Comparison Result
Day Department	82.272	10.481	-	-	-
Night Department	75.888	12.940	-	-	-
Graduate School	87.965	4.460	-	-	-
ANOVA (Tamhane)	-	-	21.734	0.000	Graduate School > Day department > Night department

3.2.4 Field of the course

As for the field of the course variable, this study found a significant difference between design, humanities, and management ($p < 0.000$) in the average scores. The data were further analyzed by Tamhane, and the result showed that management had the highest score, while the other three fields of courses, i.e., design, humanities, and law, had similar scores (Management > Design = Humanities = Law). This finding suggested that the average score of management-related courses were significantly higher than the average scores of courses of other fields. See Table 5.

Table 5. Test on the Effect of the Field of the Course

The Field of the Course	Mean	Standard Deviation	F-Value	P-Value	Comparison Result
Design	81.837	10.793	-	-	-
Humanities	79.041	11.941	-	-	-
Law	79.989	10.720	-	-	-
Management	89.729	3.413	-	-	-
ANOVA (Tamhane)	-	-	26.580	0.000	Management > Design = Humanities = Law

3.3 The effect of gender of the teacher on grading

To determine if there was a significant difference in grading between male and female teachers, this study performed an independent samples t-test on scores given by male vs. female teachers. This study found that female teachers in average gave a higher score (84.127) than their male counterparts did, and their SD was lower (8.766). This finding suggested that the range of scores given by female teachers was smaller. The independent samples t-test result suggested a significant difference between female and male teachers' grading ($p < 0.000$). The average of scores given by female teachers (84.127) was greater than the average of scores given by male teachers (80.085). See Table 6.

Table 6. The Effect of the Gender of the Teacher on Grading

Gender (Teachers)	Mean	Standard Deviation	F-Value	P-Value	Comparison Result
Male	80.085	12.002	-	-	-
Female	84.127	8.766	-	-	-
Independent Samples T-Test	-	-	-7.713	0.000	Female > Male

3.4 Teachers' grading of students of the opposite vs. same gender

This study further tested whether the students graded were of the same or opposite gender of the teacher would affect the teacher's grading. For the original scores of male and female students, the average was 83.299 for female students and 78.730 for male students. To eliminate differences in scores because of the gender of the students, this study first standardized the scores of male and female students to 84 points and then used the independent samples t-test to analyze differences between male

and female teachers in their grading.

3.4.1 Grading by male teachers

For scores given by male teachers, this study found no significant difference between male and female students in their average scores (p = 0.067). This finding suggests that male teachers when grading their students were not affected by the gender of the students. However, for male teachers, the SD of opposite-gender students were significantly smaller than the SD of same-gender students (i.e., male students). See Table 7.

Table 7. Grading by Male Teachers

Gender (Students)	N	Mean	Standard Deviation	T-Value	P-Value	Comparison Result
Male	223	80.414	16.363	-	-	-
Female	587	82.563	9.998	-	-	-
Independent Samples T-Test		-	-	-1.835	0.067	No significant

3.4.2 Grading by female teachers

As for scores given by female teachers, this study found a significant difference between male and female students in their average scores (p = 0.003), which suggests that when female teachers graded their students, they gave male students, compared to female students, significantly higher scores (87.932 vs. 85.425). However, for female teachers, the SD of same-gender students (male students) were greater than the SD of opposite-gender students. See Table 8.

Table 8. Grading by Female Teachers

Gender (Students)	N	Mean	Standard Deviation	T-Value	P-Value	Comparison Result
Male	203	87.932	11.106	-	-	-
Female	591	85.425	8.120	-	-	-
Independent Samples T-Test		-	-	2.956	0.003	Male > Female

3.4.3 Testing teacher gender and student gender interaction

This study further used ANOVA to examine whether there was a significant difference in the scores of the following four groups:(1) male teacher and male student (MTMS), (2) male teacher and female

student (MTFS), (3) female teacher and male student (FTMS), and (4) female teacher and female student (FTFS). The ANOVA result suggests that the difference was significant ($p < 0.000$). The data were further tested by Tamhane, and the result was FTMS > FTFS > MTFS = MTMS. See Table 9.

Table 9. ANOVA for Teacher Gender and Student Gender Interaction

Four Groups	N	Mean	Standard Deviation	F-Value	P-Value	Comparison Result
MTMS	223	80.414	16.363	-	-	-
MTFS	587	82.563	9.987	-	-	-
FTMS	203	87.932	11.106	-	-	-
FTFS	591	85.425	8.120	-	-	-
ANOVA (Tamhane)	-	-	-	24.709	0.000	FTMS > FTFS > MTFS = MTMS

4. Discussion

This study examined a total of 1,604 student scores, and these scores were generated between 2020 and 2021. The objective here is to use cross comparison to investigate whether male and female teachers' grading was affected by the gender of their students.

This study has the following findings: First, in terms of the gender of the students, female students' scores were significantly higher than male students' ($p < 0.000$). Secondly, for the semester variable, this study found no significant difference between the fall and the spring semester in students' average scores ($p = 0.277$). Third, in terms of the academic system, graduate students' scores were higher than day department students', while day department students' scores were higher than nigh department students' ($p < 0.000$). Fourth, when examining the field of the course, this study found that scores from management-related courses were higher than scores from courses of the other three fields ($p < 0.000$).

From testing the effect of opposite gender between a teacher and his or her students, the study result here shows that first, female teachers, compared to male teachers, gave students significantly higher scores ($p < 0.000$). Second, male teachers' grading was not affected by the gender of their students ($p = 0.067$). Third, for female teachers, they gave male students, compared to female students, significantly higher scores ($p = 0.003$).

According to the data collected in this study, female teachers when grading may implicitly give male students higher scores. Although male teachers' grading was not affected by the gender of their students ($p = 0.067$), the p-value suggested that the difference by gender was close to significant. This finding suggests that teachers when grading their students may not be aware of opposite-gender preference.

Theoretically, teachers when grading students should not be biased by the gender of their students, but if such preference indeed exists, then it is an issue that needs to be addressed by educators.

One weakness of this study is that the samples collected were too centralized; most of the samples were from teachers and students of the design department. Moreover, only few teachers provided scores of their students, which may also bias the study result. Therefore, the researchers of this study would like to apply for national research grants to carry out large-scale and long-term data collection to verify whether opposite-gender preference exists in teachers' grading practices and decisions. If gender bias truly exists, the next step is to reduce such preference in grading.

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