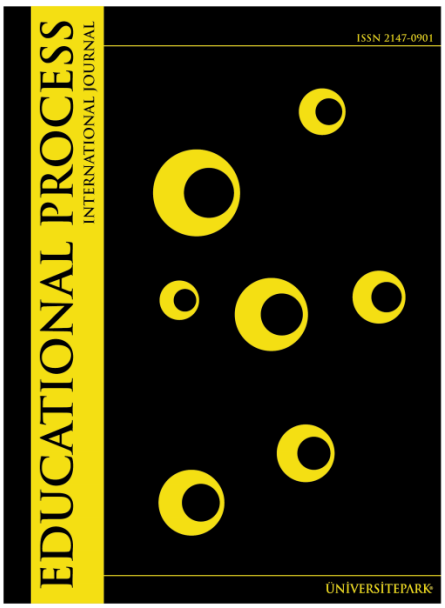


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# Why are There Different Grading Practices Based on Students' Choice of Business Major?

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**Abstract**

There is a considerable amount of focus on the grading systems applied in higher education, as it is an important tool for ranking undergraduate students' in terms of their academic success. Several studies have suggested that different grading practices exist among various colleges. This is also the case in Norway, even though the intention is to ensure that the same score is awarded independent of the individual institution. This study will explore the grading practices within a business school in Norway. Since the students can choose different pathways in their third year of undergraduate study, the academic composition of students can vary. Students with good grades mostly prefer Accounting or Finance, whilst those performing below average tend to select Marketing or Management. This composition variance causes differences in the grading pattern, as it is relative easier to achieve a good grade where the peer students are less qualified. This also has a gender effect, since females generally opt to study Marketing or Management, hence the average female student may benefit from a less rigorous grade assessment within these fields.

**Keywords:** Grading practice, higher education, business school, business courses, gender.

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## Introduction

Academic grading standards are important. It is the most widely used method for ranking students and sending correct signals to employers and those administering graduate education programs. Two students who perform equally in a subject are supposed to receive the same grade. Therefore, the Norwegian Ministry of Education has invested considerable resources to ensure similar grading practices are applied throughout the country by introducing the ECTS (European Credit Transfer and Accumulation System) grading scale system. All colleges and universities must follow this scheme and practice it in such a way that it provides equal treatment for students across educational institutions. To receive a Grade B in a certain subject should carry the same value independent of the educational institution where the student studied. The ECTS grading system is as shown in Table 1.

**Table 1.** ECTS Grading System

| *Grade* | *%* | *Description* | General, qualitative description of evaluation criteria (see: https://www.ntnu.edu/studies/grading) |
|---|---|---|---|
| F | | Fail | A performance that does not meet the minimum academic criteria. The candidate demonstrates an absence of both judgement and independent thinking. |
| E | 10 | Sufficient | A performance that meets the minimum criteria, but no more. The candidate demonstrates a very limited degree of judgement and independent thinking. |
| D | 25 | Satisfactory | A satisfactory performance, but with significant shortcomings. The candidate demonstrates a limited degree of judgement and independent thinking. |
| C | 30 | Good | A good performance in most areas. The candidate demonstrates a reasonable degree of judgement and independent thinking in the most important areas. |
| B | 25 | Very good | A very good performance. The candidate demonstrates sound judgement and a very good degree of independent thinking |
| A | 10 | Excellent | An excellent performance, clearly outstanding. The candidate demonstrates excellent judgement and a high degree of independent thinking. |

A centralized national body (The Norwegian Universities and Colleges Admission Service) is responsible for the administration of admission applications to undergraduate studies in Norway. Admission is mainly based on the applicant's GPA (Grade Point Average) score from upper secondary school.

One challenge faced by this system is that the number of enrolled students varies by educational institution and subject area. For instance, in the area of business studies, there are regional colleges where all of their applicants are successful in accessing the course of study they applied for, whilst at other schools there can be considerable competition for a limited number of places. At the most popular institutions, there can be more than four applicants for each place available. Since the enrolment criterion is the applicants' GPA, students must gain a sufficiently high score at school in order to be offered a place at the most attractive colleges and universities. The quality of the students' academic skill found

among regional colleges is mixed, and this probably has an effect on the grading praxis. Teachers at study programs that recruit the better qualified students tend to be stricter in their grading evaluations than those recruiting lesser qualified students. Although the guidelines state that equally similar performances should be rewarded equally across all colleges, in practice this does not seem to always happen (Møen & Tjetla, 2010; Strøm, Falch, Gunnes, & Haraldsvik, 2013). There can be substantial differences in the grading assessment of students among various education institutions within the same academic field. One does not follow the intention with the national norm.

The purpose of this study is to investigate whether or not different grading practices exist within a single business school in Norway. There is no single homogeneous group of students enrolled across undergraduate study programs at the Norwegian University of Science and Technology (NTNU) Business School. This has an influence on the students' choice of course major in their third year. Students with good mathematical and academic skills prefer specialization in finance-type subjects, whereas those with a fear of mathematics or perform poorly in this subject area tend to opt for non-quantitative courses such as Marketing or Management. The highest achieving students tend to study Finance or Accounting, whilst students achieving grades below the mean value mostly prefer studying non-quantitative majors such as Management or Marketing. The same pattern has also been noted at other Norwegian business schools (Aggarwal, Vaidyanathan, & Rochford, 2007).

Since there is a selection of disciplines studied by students depending on their chosen major, third-year study programs can have a diverse composition of students. In the current study, we wanted to find out if this diversity has any influence on the grading practices of the school. Specifically: Does the grading system vary based on the chosen major? Does the heterogeneity of third year students impact on the grading standard? How does the students' choice of major influence the grading policies?

*Grading System – Why Are There Different Practices?*

Students deserve to be treated equally and to be graded on the basis of their performance. Therefore, the grading standard aims to be comparable across different institutions. It is also important that grades maintain value over time (Sadler, 2009).

It is challenging to achieve a homogenous and objective grading practice according to the national norm. In Norway, the major type of exam for undergraduate business students is comprised of multiple questions with short answers or few questions requiring long-handed answers (essays), and is based on the writing of individual anonymous papers. The course requirements that determines the grades awarded, and the practices of this process vary depending on the subject area. This is different from, for example, American colleges, where different grade components are used and where multiple-choice questioning contributes considerably to the overall exam grade (Walstad & Miller, 2016). In addition, there is no grade inflation phenomenon in Norway, or not to the extent that may be found in the United States (Rojstaczer & Healy, 2012).

Since exams are based on answering questions, it is not easy to obtain an absolute grading system. Mathematics and courses that are highly quantitative tend to be stricter than non-quantitative courses that utilize open questions (Rojstaczer & Healy, 2012). Therefore, if there is no consensus among the instructors about what the criteria should be, the results will likely be different grading estimations (Sadler, 2005).

Using a relative grading system based on weighted components of various questions in the exams paper, the grading praxis is dependent on the assessments made by instructors. One cannot easily assume that a grade awarded by one instructor is equivalent to a grade assigned by another instructor from the same field. In this section, we will take a closer look at factors that may explain some of the differences seen in grading judgement.

The study of Barth, Liu, and Wells (2009) concluded that the grades awarded to students of Marketing or Management were significantly higher than those from Accounting or Finance. On the other hand, Hahn (2018) found no significant gap in grading practice between different majors in the areas of Finance, Management, and Marketing. However, he did identify a significant diversity between Accounting and Management. Aiken (1963) reported that, if the admission standards were raised, the grading standard would also shift in such a way that the real grade level would remain unchanged.

Three reasons are put forwards for the differences in grading practices, and these are explored in the following subsections.

*Students' Motivation, Preferences and Reward*

Grades provide a reward for students, and teachers use this in response to changes seen in the performance among their students, and can have the effect of motivating students to study harder. However, the system depends on the credibility of the grades (Sadler, 2009), and therein the grading process itself. Instructors can have different preferences and can each use and apply this tool differently (Ahn, Arcidiacono, Hopson, & Thomas, 2018). The composition of students and the exam form for different courses might also have an impact on the choice of grading policy parameters.

The grading system can have an influence on the choice of major. According to Sabot and Wakeman-Linn (1991), the level of grades is the most important factor in students seeking to take further or more advanced courses in the same field. If a student receives a low grade in an introductory course to a topic, it will probably reduce the possibility of the student furthering their studies in that area. If there is problem recruiting sufficient applicants for a specific major, this can in turn affect how the instructor may apply the grading scale (Ahn et al., 2018). The instructor's choice of grading practice can in effect manipulate students' effort and achievement (Bonesrønning, 2004; Bonesrønning & Opstad, 2015).

*Different Standards Practices Among Teachers*

The literature (e.g., Kezim, Pariseau, & Quinn, 2005; Sonner, 2000) indicates that temporary part-time instructors tend to award higher grades than do full-time faculty members, with significant differences found after controlling for the effect of other factors. One explanation could be that teachers hired on a semester-by-semester basis might fear being replaced. Achieving higher grades is an indicator that the necessary schoolwork has been completed. Additionally, good grades could be said to keep students happier. Therefore, there is a possibility of certain instructors being tempted to award better grades than some students actually deserve.

This impact factor increases if the faculty member subsequently uses student evaluations to appraise their own teaching effectiveness (Eiszler, 2002). By awarding students higher grades, this can help instructors to accumulate a higher number of satisfied

students, and thereby improve their instructor rating (Marini, Shaw, Young, & Ewing, 2018). There can be a direct link between the grades an instructor awards and the students' assessment report, and this factor can matter to the grading practice; which both Clayson, Frost, and Sheffet (2006) and Hoefer, Yurkiewicz, and Byrne (2012) confirmed by finding a significant positive relationship between the grades and the response students gave in their instructor evaluations. If the instructor was strict in the grading practice, and their students received lower grades than average in this subject compared to others, the students might complain and/or provide a poor evaluation of their instructor. A faculty dean or administrator might be unsure about the skills of an instructor, and of course, out of pure self-interest, no instructor wants to be in such a position. According to Clayson et al. (2006), many instructors assume there is a direct link between the grades the teacher gives the students and the students' assessment report. It is reasonable to believe this matter for the grade practice and this effect can cause grade inflation. According to Bonesrønning (1999), teacher grading valuations are closely related to the characteristics of teachers (e.g., age, skills, education, preferences, gender, etc.). Although the goal is an equal grading system, different kinds of instructors can apply differing grading practices.

*Differences in the Composition of Students*

Student programs that involve academically weaker students tend to award less stringently-enforced grades, and therefore, programs with above average grading practices are considered to be academically more challenging (Godor, 2017). Marini et al. (2018) found a significant difference in grading consideration among certain disciplines, depending on the composition of the students.

The expected grades in a study program major are dependent on the academic skill level of the student. If the instructors are applying the ECTS scale in grading practice (see Table 1), the probability of obtaining different grades depends largely on the composition of the students. Since about 10% of students will receive Grade A, it can be much tougher to manage that among academically well-qualified students with equally good performances than among a class of academically weaker students. By distributing the grades according to the ECTS scale, students enrolled to majors where the students are academically weaker than average over the entire sample will expect better grades than in their introductory course. Equally, the opposite would be the case for those who select a major attracting the most accomplished students.

According to Hu (2005), grading disparity across the disciplines can have an impact on student course choices and can also lead to course grade inflation.

## Methodology and Findings

In the current study, data were gathered from undergraduate business students at the Norwegian University of Science and Technology's (NTNU) Business School. The course portfolio is almost the same across the first two years for all enrolled students. However, in their third year of study, students can select among different majors depending on their preference. In this research, we will explore how this influences the grading practices in four different majors: Management, Marketing, Accounting, and Finance. Table 2 presents the data for a period of four years (2013-2016), with each major having around 200 students per year, and provides data from a compulsory course for each major. Undergraduate students

enrolled to another business major area can also elect these same courses, although relatively few students make use of this opportunity (approx. 10%); with the exception of Marketing and Management, where the overlap is approximately 40%. The effect of this practice means that some students are reported several times in the data.

**Table 2.** Data Statistics

| | *Performance* | *SD* | *GPA* | *% Male* | *n* |
|---|---|---|---|---|---|
| Finance | 3.48 | 1.20 | 52.17 | 56 | 279 |
| Accounting | 3.18 | 1.61 | 51.67 | 38 | 155 |
| Marketing | 3.09 | 1.14 | 51.74 | 38 | 442 |
| Management | 3.10 | 1.27 | 51.71 | 29 | 306 |

The average grade is seen to be higher for the Finance major, when compared to the other disciplines. There are small differences in the students GPA scores. However, the gender composition varies, with males overrepresented in Finance (56%), whilst underrepresented in Management (29%). To a greater extent, males tend to prefer the subject of Finance, whilst females tend to select Management. Overall, the male student ratio at the school is approximately 42%, with more females than males attending the NTNU Business School.

In Table 3, we explore the difference in the students' compulsory course performances based on their chosen major program. A significant difference in outcomes appears in favor of those who chose a major in either Accounting or Finance. This corroborates the findings of a study by Fairchild and Hahn (2019). The gap is substantial in the area of Statistics and Mathematics, with a similar trend shown for Quantitative Business and for Accounting. However, a more mixed picture appears for the non-quantitative courses, with finance-type courses also showing on top.

**Table 3.** Differences in grades based on selected major

| *Compulsory Courses by Discipline Area* | *ALL* | *MEAN DIFFERENCE* | | | |
|---|---|---|---|---|---|
| | | *MGMT* | *MKT* | *ACC* | *FIN* |
| *Statistics & Mathematics* | | | | | |
| Business Math | 2.8 | -0.9 | -0.6 | +0.4 | +0.8 |
| Business Statistics | 2.8 | -0.8 | -0.7 | +0.5 | +0.9 |
| *Quantitative Business* | | | | | |
| Business Economics | 2.6 | -0.8 | 0.6 | +0.4 | +0.6 |
| Macroeconomics | 3.1 | -0.6 | -0.4 | +0.3 | +0.7 |
| Microeconomics | 3.1 | -0.5 | -0.5 | +0.4 | +0.6 |
| Financial Analysis & Investment | 2.2 | -1.1 | -0.7 | 0 | +1.4 |
| *Accounting* | | | | | |
| Financial Accounting | 2.9 | -0.7 | -0.5 | +0.3 | +0.7 |
| Managerial Accounting | 3.0 | -1.0 | -0.5 | +0.5 | +0.7 |
| *Non-quantitative* | | | | | |
| Introduction to | 2.9 | -0.2 | 0 | 0 | +0.1 |

| *Compulsory Courses by Discipline Area* | *ALL* | *MEAN DIFFERENCE* | | | |
|---|---|---|---|---|---|
| | | *MGMT* | *MKT* | *ACC* | *FIN* |
| Marketing | | | | | |
| Organizational Management | 2.9 | -0.2 | -0.1 | +0.3 | +0.3 |
| Organizational Psychology | 2.9 | 0 | -0.1 | 0 | +0.3 |
| Business Law | 3.0 | -0.2 | -0.3 | +0.4 | +0.3 |
| *Mean – All* | 2.8 | -0.8 | -0.7 | +0.3 | +0.8 |
| Notes: F:0, E:1, D:2, C:3, B:4, A:5<br>MGMT: Management. MKT: Marketing, ACC: Accounting, FIN: Finance | | | | | |

Table 4 presents the mean grade letter for all compulsory courses the two first years, split by the selected major. The pattern is quite clear, with students enrolled to a Finance major on average showing almost one grade letter (+0.84) higher than the mean performance for all common courses across all four discipline areas. For those enrolled to Management, the opposite effect is seen, with the same difference, but as negative (-0.84) rather than positive. Students enrolled to Marketing underperform (-0.67) relative to the mean value, but the impact is less that seen for Management. Accounting students also perform better than average, with a gap of just over one-quarter (+0.27) of a grade letter. Summarily, the ranking for Finance comes out on top, followed by Accounting, then Marketing, and with the lowest being Management. Based on independent sample *t*-test, all the differences are strongly statistically significant when compared to the mean value of all students.

**Table 4.** Independent sample *t*-test of mean grade based on chosen major

| *All students (N = 909)* | | *Management* | | *Marketing* | | *Accounting* | | *Finance* | |
|---|---|---|---|---|---|---|---|---|---|
| *Mean grade* | *SD* | *Diff.* | *t-value* | *Diff.* | *t-value* | *Diff.* | *t-value* | *Diff.* | *t-value* |
| 2.86 | 1.035 | -0.84 (0.067) | -12.55 *** | -0.67 (0.065) | -10.36 *** | +0.27 (0.09) | +3.02 *** | +0.84 (0.069) | +12.08 *** |
| Notes: Standard Error (*SE*) in parenthesis , *, ** and *** denote significance at the 10%, 5% and 1% level, respectively. Two tails assuming equal variance | | | | | | | | | |

The next step was to see if the student composition variations impacted on the grading practices. The method chosen was to investigate the gap in the performance of all students between their chosen subject area and their compulsory course. The equation applied for this test is as follows:

$\Sigma \Delta ij = Xij$ = (Achievement chosen course third year) *ij* - (Achievement for similar introduction course) *ij*

(where *i* = student *i*, and *j* selected major course)

Where there are no differences in the grading practice, the difference from the expected mean is zero. According to the results shown in Table 4, students from the lowest

performing group (Management) received, on average, a grade letter that was 0.4 higher in their selected course compared with their introductory course. This effect was seen as 0.15 for Marketing, but for Accounting and Finance, however, this difference was negative, and was strongest for Finance (-0.27).

**Table 5.** Performance gap between major course and introductory course

| *MAJOR* | *M* | *SE* | *Confidence interval* | | | |
|---|---|---|---|---|---|---|
| | | | *Lower* | *Upper* | *Significance level* | *n* |
| *Management* | +0.412 | 0.0985 | +0.16 | +0,67 | 99% (***) | 262 |
| *Marketing* | +0.154 | 0.0622 | +0.039 | +0.29 | 95% (**) | 383 |
| *Accounting* | -0.138 | 0.1173 | -0.029 | 0.00 | 80% | 137 |
| *Finance* | -0.273 | 0.0665 | -0.45 | -0.10 | 99% (***) | 249 |

Notes: *, ** and *** denote significance at the 10%, 5%, and 1% level, respectively

The statistical confidence interval is significant negatively at the 99% level for Finance, and correspondingly positively for Management. For Marketing, the probability that the mean value of the difference is positive (with upper and lower values as +0.29 and +0.039) is 95%. For Accounting, on the other hand, we have to lower the confidence interval to 80%. The interpretation is that there is an 80% certainty that the true mean values of the divergence of the grade letter in the major course and introductory course is negative. These results are illustrated graphically in Figure 1 through to Figure 4.

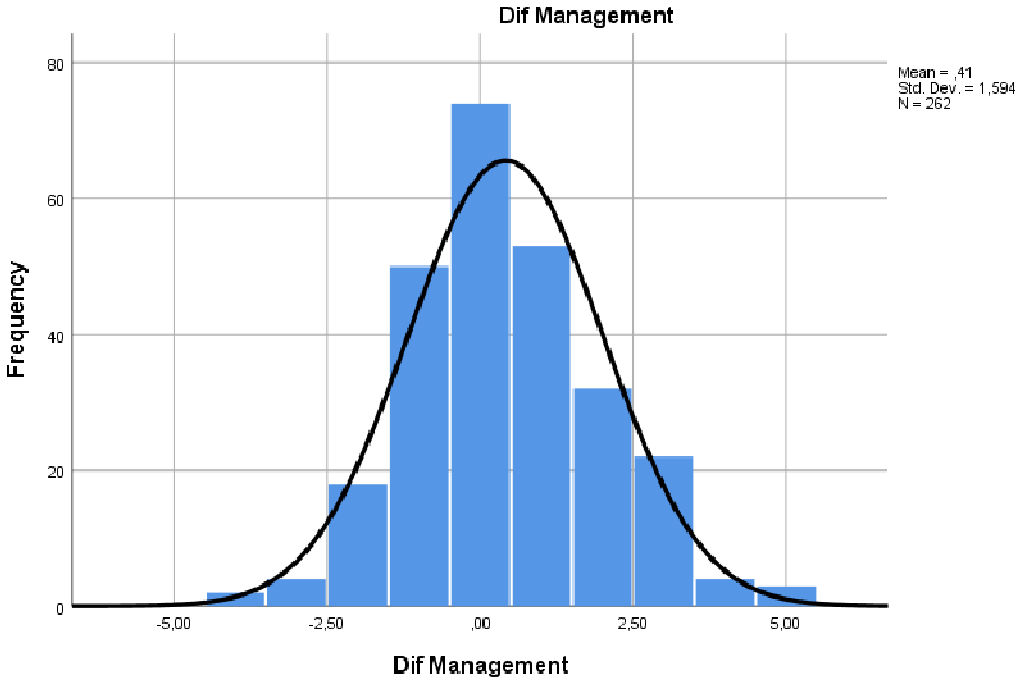


**Figure 1.** Difference between performance in major management course and introductory course

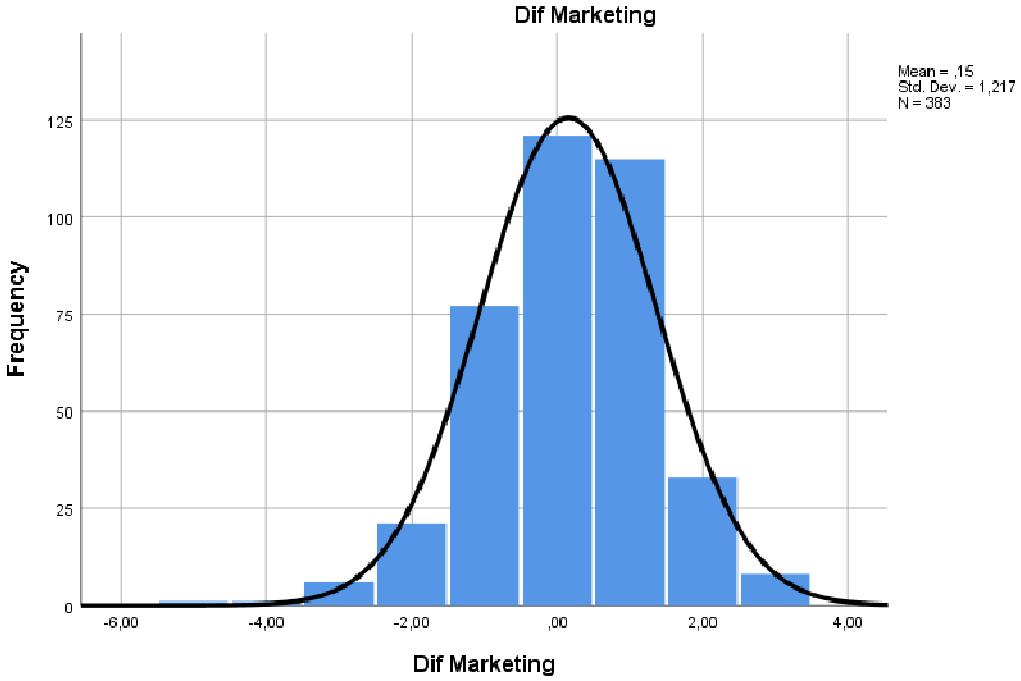


**Figure 2.** Difference between performance in major marketing course and introductory course

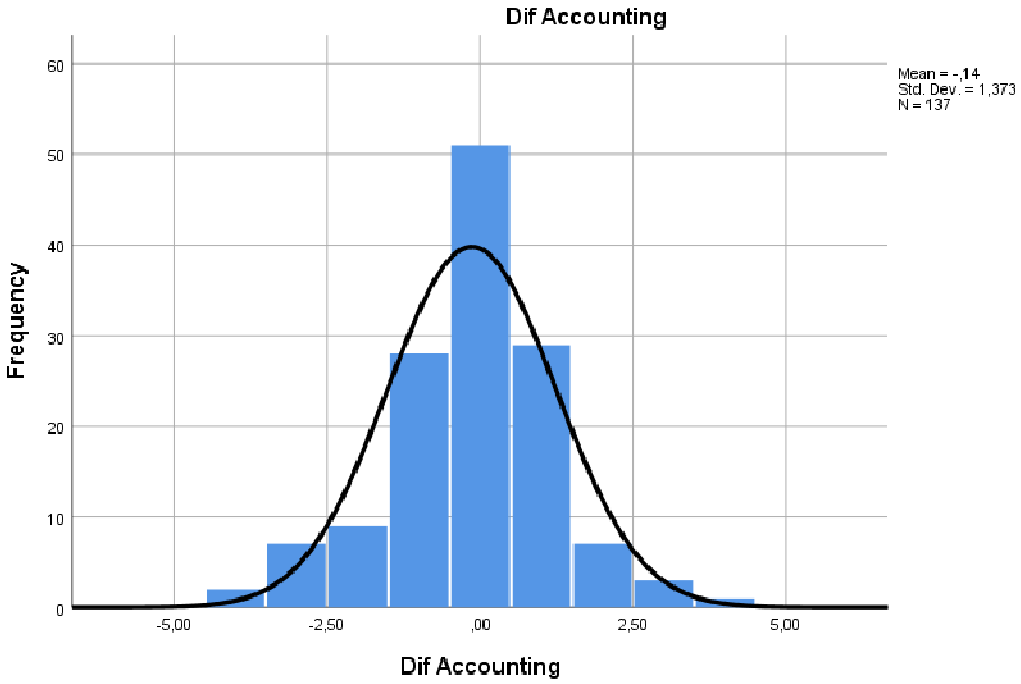


**Figure 3.** Difference between performance in major accounting course and introductory course

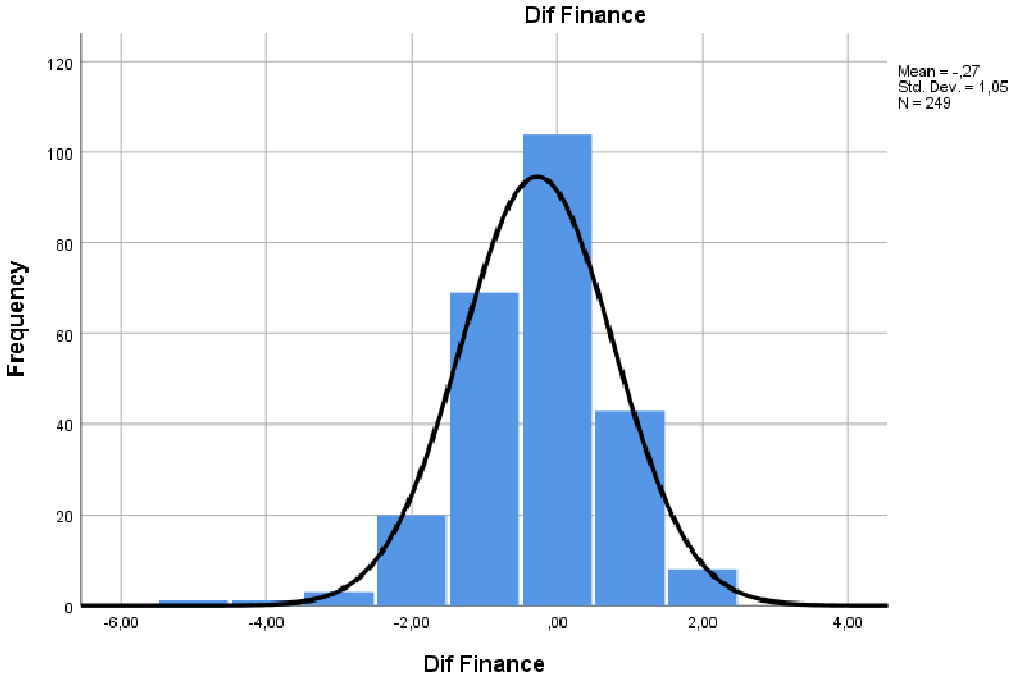


**Figure 4.** Difference between performance in major finance course and introductory course

**Table 6.** Descriptive statistics for mean results from NTNU Business School and standard *t*-test for equality of mean based on gender (assuming equal variance)

| | **All** | ***SD*** | **Female** | **Male** | **Diff.** | ***SE*** | ***t*-value** | **Sig. level** |
|---|---|---|---|---|---|---|---|---|
| **Introductory courses** | 2.86 | 1.035 | 2.80 (466) | 2.94 (348) | -0.134 | 0.060 | -1.89 | 0.06 * |
| **Major third year** | 3.25 | 1.191 | 3.27 (448) | 3.23 (335) | 0.036 | 0.086 | 0.411 | 0.68 |

Notes: *, ** and *** denote significance at the 10%, 5%, and 1% level, respectively

There is a substantial gap between the mean grade letter in third year "major courses" and the "introductory courses." Furthermore, there is a significant gender gap of 10% in favor of males for the introductory courses. Using the same test for the mean performance for the chosen major courses, this gender gap disappears. In fact, females performed better, but the difference was not found to be significant.

## Discussion

The directive of the Norwegian grading system is that students who achieve the same result will receive equal grades, independent of their enrolment qualification. This is important for the students, for their application to more advanced academic program or courses, and also for prospective employers. The consequence of different grading practices can be that one prioritizes the wrong candidates, and thereby resulting in resource inefficiencies and inequalities. The findings of this study suggest that not only do different grading evaluations exist amongst colleges, but also that they can exist within the same institution. There is a strong indicator of different grading habits based on the students' chosen business major, and many factors can explain this gap.

This paper focuses on the composition of the student population. The undergraduates' choice of major during their third year of study is based on their academic skills. This study documents that the business majors can be ranked by academic success, with Finance coming first, following by Accounting, then Marketing, and finally Management. It is suggested to be of no coincidence that there is the same significant position of differences seen in the students' achievement of their "major courses" (see Table 5) and the ranking of performance in their "introductory courses" (see Tables 3 and 4). This is a strong indicator that the participants' qualifications in the field influence how instructors rate their students. This also appears to be the case even where the same instructor teaches both the major and associated introductory courses. Courses with the most successful students achieve the highest mean grades. However, our assessment revealed that the divergence was not sufficiently wide to explain the variance in the participants' qualifications. The implication is, therefore, that differing grading practices exist. If a student decides to attend a major that tends to attract talented applicants, the consequence is that the students are required to make significantly greater efforts in order to achieve the same grade as in the introductory course to the same field. The opposite is the case for fields that tend to be chosen by students considered as being academically weaker. In such cases, even with less effort put into their major courses than for their introductory course, a student could expect to achieve the same grade.

There can be different explanations for this effect. First, the instructor is mostly unaware of the student composition based on the selected major as no official information regarding this is made available. Second, it is easier and more comfortable for the instructor to follow the composition of the ECTS grading system. The result in the current study was therefore found to be in line with expectations. If there are deviations from the expected distribution of grades, the instructor might report why it is so to their students, to their colleagues, and to the faculty dean or other senior level administrators; but this involves additional work. Third, the grading result can be seen as an indicator of the students' performance. If a student achieves a lower outcome compared to other courses or to that of the ECTS scale, some may consider this may be due to poor standards of lecturing. In many subjects, it is the instructor alone who determines the students' grades. Even where an external examiner is involved, the instructor can often influence the final grades since they hold responsibility for setting the exam questions. However, due to financial constraints, this scheme is under economic pressure. Unlike many other colleges, the NTNU Business School has retained the system whereby it uses two examiners. Either way, the instructor might have self-interest in awarding relatively good grades. Therefore, it makes sense even where the academic qualifications of students are lower to maintain an appropriate distribution of grades; which makes it is easier for a student to achieve a given score if the distribution of the students is academically weaker.

Systems with differing grading practices among major courses can cause students to behave strategically. If students are unsure as to which major course to select, they may take into consideration how easy it is perceived to achieve good grades for the disciplines they are considering. A study program where it is perceived as being easier to achieve good grades will likely attract more students. On the other hand, the most skilled students might avoid such subjects due to a perceived poor reputation as being the "easy option."

Data from the current research suggests that male students generally academically outperform their female counterparts, but that the impact is not statistically significant (at the 10% level). This was seen to be especially applicable in quantitative fields of study, where there appeared to be a gender gap in performance. In economics-based courses, some studies have shown that male students academically outperformed their female peers (Johnson, Robson, & Taengnoi, 2014; Mavruk, 2019), whilst females performed academically better in non-quantitative courses (Friday, Friday-Stroud, Green, & Hill, 2006). This trend was also found to apply to students at the NTNU Business School (Opstad & Årethun, 2020). There was also a gender difference noted in the courses taken; with female students tending to opt for majors such as humanities and education, whilst male students largely selected the sciences or engineering fields. Overall, therefore, females students are less likely to select majors that are based on finance (Zölitz & Feld, 2019).

One main reason why the gender gap disappears for the major courses in the third year of undergraduate study in Norwegian business schools is the change in student composition. Females tend to choose non-quantitative courses, where the grade evaluation is perceived to be more lenient, whilst males tend to prefer finance-based subjects, with a reputation for having a more strenuous grade rating. This situation results in a relatively better level of achievement for the average female student when compared to their male counterparts. Other researchers (e.g., Keiser, Sackett, Kuncel, & Brothen, 2016; Mattern, Sanchez, & Ndum, 2017) have also reported the same phenomenon.

## Limitations and Further Research

The data in the current study were sourced from a single business school in Norway. No data was collected to look for reasons other than the differing student composition to explain the differences in grades awarded for introductory and chosen major courses. This limitation could therefore be addressed as an issue in future studies.

## Conclusion

The findings in the current study were not found to corroborate the conclusion of Aiken (1963), who reported that if admission standards are raised, grading standards will also shift in such a way that the actual grade level remains unchanged. It would therefore appear that the distribution of grades does not sufficiently take into account the different enrolment qualifications within and among educational institutions. This is a challenge since it can send the wrong signals to employers and to admission administrators of further or more advanced study programs, and hence lead to incorrect prioritization being applied. Such a situation goes against the Norwegian national goal of applying equivalent grading practices regardless of college or admission criteria.

Since the study showed that female students prefer to attain their undergraduate business degree in a subject area known for less rigorous grade awards, female students (unlike males) on the whole achieve better grades than predicted.

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