

# Business Students Have Different Views about Their Performance and Approach to Study in Relation to Exam Formats, Depending on Attitudes Towards Digital Teaching

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Received: August 29, 2022; Accepted: September 21, 2022; Published: September 22, 2022

## Abstract

The aim of this article is to see if there are substantial differences in attitudes towards teaching methods and choice of assessment between the students who are present at campus and to those who prefer the online version. During COVID-19, we got a unique opportunity to compare the students who took the same course and had identical exams. The same questionnaire is distributed to both groups in a compulsory subject in economics at Norwegian University of Science and Technology (NTNU). The choice of method is a pairwise comparison of the mean values using T-test. The findings show a significant difference between these two groups. Those who chose to be on campus had higher Grade Point Average (GPA) at high school, and they preferred the traditional form of exams. Those who chose to follow the lectures digitally favoured multiple choice tests, or home-based 'open book' exams. This means that both teaching methods and the choice of exam forms can have a major impact on the ranking of the students.

**Keywords:** assessment formats, business schools, online teaching, performance, study habits

## 1. Introduction

The composition of undergraduates at a business school is heterogeneous. They have different academic preferences, interests, and personal characteristics. Therefore, teaching methods and the choice of exam form can have a major impact on study habits and performance in the various subjects. During the COVID-19 pandemic, there were opportunities to study this in more detail, by comparing the attitudes of students who chose lectures on campus and those who preferred a digital format for their lectures.

The COVID-19 pandemic did not give higher education (HE) institutions many choices. It was necessary to shut down face-to-face learning and switch over to remote online teaching. This change also provided opportunities to consider different alternative approaches regarding teaching practices and assessments design (Guangul et al. 2020). Traditionally, introductory courses in economics and business have been taught with students present in the classroom or auditorium. According to Walstad and Miller (2016), this method is utilised in more than 80 per cent of institutions. Overall, 14 per cent use a hybrid solution (both physically and online), and less than 5 per cent use online teaching only.

The change in teaching methods due to the pandemic has resulted in a lot of research that tries to identify the effects this has had on the students' learning and performance. Some report students have changed habits and engagements.

Not only did the form of teaching change almost overnight, but also the choice of exam form. Oral tests or assessments with physical attendance and closed textbooks were replaced with different kinds of online or home-based exams.

In Norway, the challenges of COVID-19 were tackled in various ways in HE, with either purely digital teaching or a hybrid solution; namely combining physical and digital presentation. Due to the pandemic, there were restrictions on how many students could physically attend the lectures. Online recordings of the lectures were available. Students could choose whether to be physically present, or to watch the instructor's presentation digitally. At the Norwegian University of Science and Technology (NTNU) Business School, around 250 students participate in compulsory courses at undergraduate level. During the fall of 2020, around 50 students were physically attending the lectures. It was possible to compare the attitudes of these two groups of students, by

distributing questionnaires to the students who were present and the same ones digitally to those who saw the lecture online. The focus in this study was to see if there are any differences among these two groups in terms of their attitudes and views about various kind of assignment formats. As has been stated, business students are quite heterogeneous in their academic abilities, preferences, and interests (Opstad 2019; Opstad 2020).. Therefore, it is of interest to see if there are different preferences between students who choose to be on campus and for those who select to stay away. advantage of this study is that it compares the students on the same course, who received identical instruction. This research provides useful information about how to design learning methods and the choice of exam forms.

Due to the Internet and available technology, the possibility of online teaching has dramatically increased (Crews & Parker, 2017). Many students can take subjects without physically being present on campus. This has created challenges for the traditional exam with physical attendance and closed textbook, leading to discussion about what is the best-suited form of exam. One considers using more multiple-choice tests (MCTs), as well as continuing with digital exams.

## 2. Literature Review

Switching to online learning during COVID-19 has caused challenges for some students, not only technological, but also in terms of increased levels of stress and anxiety (Biwer et al., 2021; Collazos et al., 2021). According to Unger and Meiran (2020), most undergraduate students report that online teaching is not the same as in in-classroom teaching. The rapid change has caused anxiety among a lot of the students. This is in accordance with the finding of Al-Mawee Kwayu & Gharaibeh (2021). On the other hand, online learning provides more location and time flexibility.

Bettinger et al. (2017) suggest virtual teaching is inferior to the traditional classroom instructions. Mamentu (2021) claims online teaching may not have negative impact on students' learning approach. Engelhardt, Johnson & Meder, (2021) argues that it is important to compare the change to online teaching with previous learning methods. The transformation happened suddenly and unexpectedly, and neither the students nor the instructors were prepared for this. Engelhardt et al. (2021) report 97 per cent of the institutions had no prior virtual teaching practice, and 56 per cent applied the methods without any, or only minor, preparation. Furthermore, many institutions were lacking the necessary technical tools.

According to Slack and Priestley (2022), some students find online teaching more demanding, and this results in weaker performances, while other students consider it to be more flexible, resulting in an increase of learning, and thus they give the online formats more favourable assessments.

Engelhardt et al. (2021) suggest female students outperform male students when shifting from face-to-face face instructions to online learning. However, a comparison of students' performance with online teaching during the COVID-19 and traditional teaching before the coronavirus showed mixed results (Refaat, 2020; Iglesias-Pradas, 2021). Pilotti, El-Moussa & Abdelsalam (2022) suggest a key factor for success with online teaching is the strong institutional support of the participants. Some researchers have found a significant difference to the detriment of the academically clever students that is caused by switching from classroom to remote teaching (Nazempour, Darabi & Nelson, 2022; Rodriguez-Planas, 2021). Hansen Thon & Umbach , (2021) emphasise students' attendance is positively linked to students' success. However, students who are less skilled academically tend to be less present for face-to-face teaching and they can benefit from online teaching, as it gives more flexibility. This might explain why those students perform better, when attending online teaching in economic courses.

Barrance (2019) discusses the fairness of assessments in different contexts. There might be some inconsistency in the evaluation. Some students worry about bias in grading practice, for instance by choosing oral exams. One can also find assessments that simply test students' ability to memorise, instead of their deeper understanding, knowledge, and skills. Clever students may find this to be unfair. There is a growing interest around this issue. There are obviously individual differences in attitudes and performance (Camilli, 2013). The choice of exam design influences the students' performance and ranking. For instance, there are participants who struggle to perform well and show their knowledge under stress and time pressure. Hence, they perform below their true ability. By choosing home-based exams, students suggest there is a variation of the level of assistance and tools available—like help from parents and tutors. It is challenging to ensure a balance of the different aspects of justice and fairness through the selection of the form of exam.

Some researchers have suggested that many students preferred closed-book examinations instead of open-book tests during the pandemic period (Buckley et al., 2021; Spiegel & Nivette, 2021). The students are divided as to how to handle home-based tests. Some students experience increased stress, while other students report high anxiety related to traditional examinations (Tam, 2022). Some students are less comfortable and motivated with

home-based tests compared with closed-book exams (Williams Dziurawiec & Heritage, 2018). This can have a negative impact on effort and performance (Sahu 2020). On the other hand, many students benefit from online learning and open-book tests, due to factors like flexibility and independence (Dhawan 2020). There are obviously social and individual variations in how students are coping with digital teaching and digital assignments with the open book technique during COVID-19 (Misca & Thornton, 2021). There are obviously different preferences among the students about remote or in-person teaching and, in the choice of assessment formats (Jones et al., 2021; Slack & Priestley, 2022). Some students do not find digital teaching and home-based tests to be attractive. They are less motivated, less satisfied, and perform more poorly than in the traditional methods, while other students have the opposite view. This means that the institutions' choice of teaching and assessment practice might have considerable impact on the students' performance and the ranking of the students. Opstad and Pettersen (2022) confirm this finding. Home-based exams do not favour older students and those with good grades, as well as students of theoretical mathematics from upper secondary schools. This could change the ranking of the students (Opstad, 2022).

There is a lot of disagreement in the literature regarding the effect of switching from in-class exams (ICE) to take-home exams (THE) (Bengtsson, 2019). There are advantages and disadvantages for each of the different formats. This varies in terms of whether the chosen design meets the requirements for the exam, such as fairness, the creation of a good learning environment, whether it measures the skills and knowledge of the students, and more. If there is a hard time limit, it is only possible to test part of the issues in a course. Some of the advantages of THE is that it provides a good learning experience and the possibility of testing at a higher level of the Bloom taxonomy of educational learnings objectives (for instance analysing and evaluating), it reduces anxiety, and is flexible and cost-effective (Krathwohl, 2002). Examples of disadvantages are the promotion of unethical behaviour and more hunting for answers by using textbooks and searching the Internet. With limited time, the effect may be that some students spend time looking for answers instead of using their own intelligence and analytical skills. Therefore, when switching to THE, one should ask different questions. There is no point in answering questions that can be easily found, and then directly transcribed from the textbook. Hence, THE questions should focus on a higher level of taxonomy, thus forcing students to apply a higher-level analysis and knowledge.

Researchers are divided about the impacts of THE or take-home test (THT). Some authors argue THTs stimulate good learning habits, long-time learning retention, as well as increasing the students' efforts (Haynie, 2003). Others claim THT will decrease the time students spend on their subject, and they will only read parts of the textbooks. With an open book test they can just hunt for the correct answer during the assessments (Rich Jr et al. 2014, Tsapalis & Zoller, 2003).

There are also differing views among scientists about the impact of replacing constructed response tests (CRT) with multiple choice tests (MCT) (Kuechler & Simkin, 2010). Students are divided in their view of the use of MCT, but the majority wants this type of exam. An important reason may be that they expect to achieve better grades (Chan & Kennedy, 2002; Iannone & Simpson, 2015). Opstad (2021a) claims students who have success in essay writing and like a deeper level of learning prefer CRT, while students who tend to acquire knowledge at a more superficial level and perform well with multiple-choice questions, favour MCT.

### 3. Research Questions

Using data from a business school this article seeks to answer some questions regarding students' attitudes towards remote teaching and assignment forms. The students are divided into two groups. The first group consists of students who have chosen to watch the lectures virtually during COVID-19 (online), and those who prefer to be physically present at the lecture (present). The review of previous research may indicate that these two groups are quite different and have different attitudes. This paper will investigate this topic by using research questions.

Research question 1: The two groups have different views on the benefits of attending lectures.

One can expect students who choose to attend the lectures believe that they benefit more from this choice than those who are absent.

Research question 2: Students' effort and motivation of the assignment design vary between these 2 groups.

In this study, we look at 3 exam forms multiple choice test (MCT), constructive response test (CRT) and take-home test (THT). Since the students are quite heterogeneous, the assumption is that this is reflected in the attitudes among the two selected groups.

Research question 3: There are different views among the two groups to which degree the chosen exam format catches up the students' knowledge.

The research shows that students acquire knowledge in different ways. (Barrance,2019). This may have an impact on the desired form of examination.

Research question 4: The level of anxiety and view of fairness vary among the two groups.

There is no easy answer what a fair test form is. Furthermore, there is great variation in students' anxiety related to exams. In this study, we will investigate whether these factors affect the two groups differently.

Research question 5: The ranking and students' performance of the chosen assignment various among the two groups.

Several studies show that students performance depends on the form of the exam (Opstad, 2022). The assumptions in this research are that the students in the two groups have different success.

## 4. Methodology and Data

### 4.1 The Sample

Due to COVID-19, few students at the NTNU (Norwegian University of Science and Technology) Business School were physically present (in a compulsory subject, for the 2nd year of a bachelor's degree) to answer a questionnaire about attitudes towards different forms of examination. Despite several rounds, only 51 out of about 250 students answered the questionnaire about attitudes and behaviours in different forms of examination. In order to increase the response rate, a digital questionnaire was used to follow up. Experience has shown that the response rate can be low with this approach, but we obtained answers from an additional 41 students. In total, the response rate was over 35 per cent. With responses from only 41 of the 200 who were not physically at the lectures, this is not a random sample. The data might be bias, but the survey gives a picture of students' attitudes. It is interesting to compare respondents from these two groups. Table 1 shows the distribution by gender.

Table 1. Distribution by gender

	Males	Females	Total
Digital	21	24	45
Physical	22	29	51
Total	43	53	96

Female students tend to be more physically present at the lectures. This is reflected in the survey.

About half of the students disclosed their identities. This made it possible to connect the answers to administrative data about Grade Point Average (GPA) from upper secondary school as well as achievements in some subjects.

### 4.2 Methodology

This study compared the mean for two groups, and investigated whether there are differences between the two groups of students. To see if there are significant effects, the t-test is used. The focus of this study is to compare 2 groups, then pairwise comparisons will be a suitable method for capturing differences.

The data show small gender differences. Therefore, this is not further discussed in the analysis. This study focusses on three forms of examination:

1. traditional closed-book school exam, also called constructed response test (CRT),
2. multiple choice test with closed book (MCT)
3. take-home test (THT) with open book, essay questions with about the same time limits as CRT.

We will see if attitudes towards learning outcomes, effort, and motivation are different for the 2 groups depending on kind of assessment test. A 7-point Likert scale was used in the analysis, where 1 is 'disagrees completely' and 7 is 'completely agree'.

## 5. Findings and Discussion

### 5.1 Remote Learning (Research Question 1)

As expected, there are significant differences with regard to being physically present at the lectures (Table 2). Those who highly value being there physically attend if they have the opportunity.

Table 2. Preferences of teaching, mean values (a 7-point Likert scale, standard deviation in parentheses)

Variable	All (N=96)	Online (N=45)	Present (N=51)	Diff.	Sig.
<b>Preferences</b>					
Present (I prefer to be present at the lectures)	5.26 (1.58)	4.64 (1.74)	5.79 (1.19)	-1.44 (0.30)	0.000 ***
Present versus digital (I consider being present at the lecture to be better than seeing it online)	4.52 (2.23)	3.58 (2.23)	5.33 (1.90)	-1.75 (0.42)	0.000 ***
Study at home (I prefer to study at home)	4.46 (1.739)	5.16 (3.87)	3.87 (1.66)	-1.29 (0.33)	0.000 ***

\*\*\*:  $P < 0.01$ , \*\*:  $P < 0.05$ , \*:  $P < 0.1$

Those who follow the lectures online (using online streaming), also consider the utility of the lectures to be quite high. This gets an average score of 4.64 (out of maximum of 7.0). Many of these will attend the lectures under normal conditions.

If the lecture is streamed, some students are not so eager for physical attendance. Watching the lectures online has clear advantages. You do not have to travel to the campus, and you can record the lecture to see it when it suits you. It provides much more flexibility. Here the students are divided in their views, and there is a big, significant difference in the attitude between the two groups.

### 5.2 Effort and Motivation (Research Question 2)

MCT has a positive impact on effort and motivation for the online students compared with those that chose to be present at the lecture (Table 3); the gap is statistically significant in terms of motivation. The same tendency applies to home-based exams. This form of exam leads to the greatest positive reaction of students who follow the lectures digitally, and there is a significant impact related to effort. However, for school-based exams with a few questions and closed textbook, the situation is different, but with the opposite effect. The online students are less motivated, and they reduce study effort compared to those students who are at the campus. This is an indicator of a distinction in study behaviour among the students. Those on campus respond positively to traditional school exams, while online students are more attracted to MCT and THT. This may explain why the research is so divided in the view of how different forms of examination affect motivation and effort, and without any clear conclusion (Bengtsson, 2019). This research shows that the results depend on which kind of students are included in the survey.

Students' effort and motivation are important instruments to acquire knowledge, success, and to create the optimal learning environment. Students behave differently depending on assessments' formats, grading system, their personality traits, and academic skills. There is a substantial variation among the candidates (Opstad, 2021a; Stinebrickner & Stinebrickner, 2008). For example, the response to a change in grading system or assessment will therefore vary from student to student (Bonnesrønning & Opstad, 2015; Fallan & Opstad, 2012). This is confirmed in this study.

Effort and motivation are linked. Motivation is positively correlated with effort. If the students are more interested in the subject, they tend to have higher motivation, and this has a positive impact on effort (Kim et al., 2015).

Table 3. Students' effort and motivation, mean values (7-point Likert scale, standard deviation in parentheses)

Variable	All (N=96)	Online	Present	Diff.	Sig.
<b>Effort</b> (I will study hard with this kind of assessment)					
MCT	4.13 (1.50)	4.33 (1.61)	3.96 (1.40)	0.371 (0.31)	0.113
CRT	5.53 (1.29)	5.33 (1.35)	5.69 (1.56)	-0.359 (0.26)	0.088 *
THT	5.40 (1.39)	5.62 (1.32)	5.21 (1.44)	0.411 (0.28)	0.075 *
<b>Motivation</b>					
(This assessment gives me high motivation)					
MCT	4.10	4.44	3.80	0.641	0.019 **

	(1.51)	(1.60)	(1.37)	(0.30)	
CRT	4.61	4.56	4.65	-0.098	0.376
	(1.51)	(1.50)	(1.53)	(0.31)	
THT	4.92	5.11	4.75	0.411	0.125
	(1.53)	(1.48)	(1.57)	(0.28)	

\*\*\*:  $P < 0.01$ , \*\*:  $P < 0.05$ , \*:  $P < 0.1$ .

### 5.3 Knowledge (Research Question 3)

Table 4 shows that two students groups are divided in their views about whether the different exam formats effectively examine knowledge in the subject. Online students agree more about this question regarding MCR and THT. The gap is biggest for multiple-choice based exams, and the difference is strongly statistically significant. The result is the opposite for CRT, but the correlation is not significant.

Table 4. Testing students' knowledge in the subject, mean values (7-point Likert scale, standard deviation in parentheses)

Variable	All (N=96)	Online	Present	Diff.	Sig.
<b>Knowledge</b>					
(Tests my knowledge in the subject)					
MCT	4.09 (1.53)	4.45 (1.55)	3.78 (1.46)	0.670 (0.31)	0.016 **
CRT	5.09 (1.55)	5.04 (1.55)	5.13 (1.56)	-0.090 (0.32)	0.388
THT	5.26 (1.34)	5.42 (1.36)	5.12 (1.32)	0.305 (0.27)	0.134

\*\*\*:  $P < 0.01$ , \*\*:  $P < 0.05$ , \*:  $P < 0.1$

One possible explanation is that these two groups have different ways of approaching learning. According to Chan and Kennedy (2010), MCT measures a lower level of knowledge and skills than CRT. By applying Bloom's taxonomy, MCT primarily captures level 1 of knowledge, while CRT can more easily cover higher levels of learning, such as application, analysis, and evaluation. The research of Opstad (2021b) confirms this tendency. The findings of this analysis may indicate that a much higher proportion of students in the online group put the spotlight on memorizing, learning facts, and have a more superficial approach, while many of the students in the present group are concerned with deeper forms of learning. They go more in-depth, and will analyse and understand the topics.

We see the same tendency in home-based exams. Students who have a more superficial approach to learning believe that knowledge is easily captured by looking in the textbook or searching the Internet (Rich Jr et al. 2014). These opportunities are lost at CRT. This may explain the results of this survey.

### 5.4 Anxiety and Fairness (Research question 4)

Students are much more nervous when taking traditional school exams in comparison to multiple choice assignments or home exams (Table 5). The findings suggest digitally oriented students are more anxious regarding the CRT and THT. For MCT, on the other hand, they are less nervous than the other group. The gaps are not significant in this survey.

Table 5. Anxiety and Fairness, mean values (7-point Likert scale, standard deviation in parentheses)

Variable	All (N=96)	Online	Present	Diff.	Sig.
<b>Anxiety</b>					
(I have high levels of anxiety with this kind of assessment)					

MCT	2.56 (1.50)	2.53 (1.55)	2.58 (1.47)	-0.44 (0.31)	0.444
CRT	4.89 (1.73)	5.04 (1.81)	4.75 (1.67)	0.299 (0.36)	0.201
THT	3.26 (1.59)	3.40 (1.80)	3.13 (1.39)	0.265 (0.32)	0.207
<b>Fairness</b> (The exam is fair)					
MCT	4.04 (1.61)	4.36 (1.64)	3.77 (1.55)	0.586 (0.33)	0.074 *
CRT	4.79 (1.77)	4.71 (1.73)	4.87 (1.83)	-0.154 (0.363)	0.671
THT	3.94 (1.87)	4.16 (1.88)	3.70 (1.84)	0.456 (0.41)	0.264

\*\*\*:  $P < 0.01$ , \*\*:  $P < 0.05$ , \*:  $P < 0.1$

The same pattern applies in relation to fairness. Justice and perceived justice are terms with many dimensions (Baniyadi et al., 2021). Students might find THT unfair since the ranking of the students may change due to cheating. Other reasons may be the fact that the exam design favours some characteristics, and some students feel they are not rewarded commensurately with their skills. Therefore, it is not surprising that students who are most comfortable with a specific kind of assessment consider this exam form to be fair. Hence, the mean student among the online ones perceives a MCT as being much fairer than the students present on campus. The difference is statistically significant. The same gap applies to home-based exams, but the impact is not significant. According to previous research, many home-based exams are considered to be less fair than school exams due to access to different tools and one can be tempted by unethical behaviour (Bengtsson, 2019; Opstad 2022).

##### 5.5 Expected Performance and Actual Performance (Research Question 5)

A clear difference between the two groups is also reflected when it comes to expected success (Table 6). Students on campus expect to achieve significantly better grades with the school-based exam with closed textbook. For the other two exam forms, the pattern is the opposite. Students expect to perform more poorly than the other group.

Table 6. Students' expected performance (7-point Likert scale)

Variable	All (N=96)	Online	Present	Diff.	Sig.
<b>Good performance</b> (I expect to have success)					
MCT	4.91 (1.25)	4.96 (1.19)	4.87 (1.31)	0.090 (0.26)	0.363
CRT	4.41 (1.54)	4.18 (1.70)	4.63 (1.36)	-0.477 (0.32)	0.082 *
THT	5.24 (1.19)	5.36 (1.11)	5.14 (1.26)	0.213 (0.25)	0.193

\*\*\*:  $P < 0.01$ , \*\*:  $P < 0.05$ , \*:  $P < 0.1$

As approximately half of the students have given information about their identity, it was possible to link the survey to actual results (Table 7). This results in interesting discoveries. First, the students who attend the lectures have a higher GPA (Grade Point Average) from upper secondary school than those who follow the lectures digitally. They also have higher success in the two subjects (Business Mathematics and Marketing) that were arranged in the traditional way (CRT). Even with few observations, the difference is significant for the introductory course in Business Mathematics. The assessment in Managerial Economics and Accounting was a mix of CRT and MCT (around 50 per cent of the evaluation was related to multiple choice questions). Here, the two groups perform equally. Due to COVID-19, Cost Accounting and Budgeting was organised as a home exam with letter grades. Here, the digital students have significantly higher success than those on campus.

Table 7. Actual performance, mean values (standard deviation in parentheses)

Variable	All (N=45)	Online (N=22)	Present (N=23)	Diff.	Sig.
GPA (Upper Secondary School)	52.6 (3.38)	51.7 (2.03)	53,4 (4.13)	-1.65 (0.95)	0.090 *
Business Maths (CRT, first year)	3.36 (1.31)	3.38 (1.41)	4.05 (1.12)	- 0.673 (0.38)	0.086 *
Managerial Economics and Accounting (Mixed CRT and MCT, first year)	4.02 (1.52)	4.05 (0.87)	4.00 (0.80)	0.048 (0.25)	0.850
Marketing (CRT, first year)	3.11 (0.90)	2.95 (0.87)	3.26 (0.92)	- 0.308 (0.27)	0.258
Cost Accounting and Budgeting (THT, second year)	3.32 (1.52)	3.47 (1.47)	3.20 (1.58)	0.274 (0.46)	0.557

A:5, B:4, C:3, D:2, E:1, F: 0

\*\*\*:  $P < 0.01$ , \*\*:  $P < 0.05$ , \*:  $P < 0.1$ 

This confirms that students perform differently depending on the form of the exam. There is a clear distinction between online students and campus students. Those present at the lectures have better admission qualifications, and they expect to – and actually achieve – better performance at traditional school exams. However, they do not seem to have the same success if the schools switch over to MCT or THT. Our figures may indicate that despite better qualifications from the upper secondary school, they may get lower grades compared to the online group at home-based exams. One explanation for the latter is that home-based exams provide different conditions than traditional exams, and this affects the ranking (Opstad, 2022; Opstad & Pettersen, 2022). However, there are quite a few observations in this research, so one must be careful when drawing conclusions.

### 5.6 Comparing the Two Groups of Students, an Overall Evaluation

By comparing the students who chose to appear on campus and those who preferred to watch the lectures digitally, this survey indicates that there are significant differences between these two groups. This distinction applies to various factors. The students who show up on campus believe face-to-face learning is a much better learning method than digital teaching. This group prefers the traditional form of exams, and this influences their study behaviour. These factors are linked together. When using CRT, the students expending high levels of effort and who are well motivated, feel that the scheme is fair and captures their knowledge. In accordance with previous surveys, this may indicate that this group is characterized by focussing on higher levels of learning (Bloom's taxonomy), and not just on describing and presenting facts (Bengtsson, 2019). This is probably related to personal characteristics, skills, and interest, and not least on learning approach. These students become uncomfortable with a change to MCT or THT. This is in line with previous research that the exam design influences the ranking of the students (Opstad, 2022; Opstad & Pettersen, 2022).

For the digital students, the picture is the opposite. They are more comfortable with other types of exams than CRT, and they tend to favour MCT. Such assessments will increase their relative effort, motivation, and capture their knowledge to a greater extent. One explanation is that they approach knowledge in a different way than the campus group. They may prefer a more superficial form of learning (Chan & Kennedy, 2002).

There are also substantial distinctions between the two groups when it comes to home-based exams, but the gap is smaller. This suggests that the online group prefers open book exams with access to various different tools, if the exam contains only a few questions and the students must analyse subject areas and answer using their own words. These students probably see the benefits of more flexible solutions compared to the traditional teaching and evaluation design.

## 6. Conclusion and Recommendation

The research shows a mixed picture of attitudes and how students experience different forms of teaching and types of exams (Bengtsson, 2019). The explanation may be that the findings depend on who is included in the survey. This study shows that the students are not a homogeneous group (in terms of their academic background, mathematical abilities, personal characteristics, etc.). Their performance and study habits will depend on the chosen form of examination. There is a big difference between those students who prefer being on campus and



physically attending the lectures, and those who favour digital presentations. By comparing the two groups for the same subject in the same semester test, it is evident that the cleverest students academically choose to be present at the lectures. They want traditional school exams with closed textbooks. This leads to high motivation, good study habits, and is perceived as fair.

Students who follow the lectures digitally favour multiple choice exams. This generates high study effort and is considered more fair than traditional essay questions. These students also prefer home-based exams to be arranged as a substitute for the traditional school exam.

This is useful knowledge in evaluating teaching methods and exam designs with the possibilities that exist today. Since technology provides opportunities to test new forms of teaching and examination, it is recommended that education institutions try to combine different types instead of focusing on only one form since it can easily favour one type of students.

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