

Student teachers' reflections of advantages, disadvantages, and learning related to lecturers' different pedagogical methods

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Abstract

Background and Study Aim Improving the quality of teaching in higher education is essential. Equally important is obtaining a detailed understanding of students' reflections on their educational experiences. The purpose of this study was to evaluate students' reflections related to their learning and the advantages and disadvantages of different pedagogical methods.

Material and Methods A mixed-methods design was employed, including questionnaires and follow-up interviews with students. A 15-credit course in a master's degree program in physical education was conducted using different teaching methods over three consecutive years. After completing the course, 59 students filled out a questionnaire that measured their reported learning outcomes from eight different pedagogical methods. Once the quantitative data was analyzed, seven students were randomly selected for individual in-depth interviews.

Results The quantitative data revealed that students generally reported good learning outcomes across all pedagogical methods. No gender differences were found in any of the eight methods. The main results from the in-depth interview analyses showed that students identified both advantages and disadvantages in all methods. According to students' reflections, all methods contributed to learning, and a combination of lectures and practical activities produced especially good outcomes.

Conclusions The results of this study highlight the importance of using a variety of methods when planning and executing university teaching. It is also essential to be aware of the disadvantages of each method and to work on minimizing them. Additionally, lecturers are encouraged to conduct research on their own teaching practices to improve the quality of education.

Keywords: student teacher, pedagogical methods, experienced learning, advantages, disadvantages

Introduction

The effectiveness of teaching methods in higher education is an important issue for educators and the education system as a whole. One of the key aspects of this issue is how students perceive different pedagogical approaches and methods. Therefore, exploring their perspectives becomes especially relevant for improving the quality of education.

In this context, the responsibility for facilitating optimal learning is a highly challenging yet intriguing endeavor, with few established guidelines on how to achieve it [1]. Teachers should attempt to develop an understanding of the main factors that contribute to the highest possible learning outcomes [2]. It has been argued that the purpose of teaching is to support learning, and that students should be offered a diversity of appropriate learning activities to increase deep learning [3]. Furthermore, a wide range of available teaching methods exist, but choosing the best one or the optimal combination can be markedly challenging [4].

Traditionally, lectures are commonly used as a pedagogical strategy at universities [5]. However,

research indicates that lectures make students into passive listeners, and activating students to a substantially greater extent regarding the lectures has been frequently suggested [6, 7, 8, 9]. The purpose of activating the students is to increase their involvement in education, which will enhance their engagement and learning outcomes [10, 11]. Despite increasing knowledge of the importance of adapting teaching to learning outcomes and particular student groups, much of the teaching at universities is still implemented as lectures [5]. Lectures produce cognitive activation and constitute an arena for practicing listening and writing notes [12], and for discussions between students and lecturers on theoretical issues [13]. In previous literature, students have pointed to the importance of small "breaks" for interaction, connect theory to practice, having standing breaks, and taking students' interests into account [14, 15, 16, 17]. For many students, lectures are often experienced as tedious, and it is asserted that higher education should take the above-mentioned suggestions as urgent calls for further improvement of the teaching excellence and student satisfaction [18, 19].

Group work is another pedagogical strategy that is frequently employed by lecturers in

universities [20], and research has proven that the method enhances achievement and persistence [21]. Furthermore, discussions in group work, in which different viewpoints are expressed, have been demonstrated to enrich student learning [20]. However, group work as a pedagogical method in universities presents several challenges [22], as students' diversity of level of effort and difficult group dynamics. Students have also reported some challenges with group work as homework [23]. A study showed that some students felt that they were excluded, some experienced anxiety regarding the task, and some stated that discussions with peer students produced low learning outcomes [24].

Lectures have been demonstrated to be useful for giving students requisite knowledge, which they could then use for further development of problem-solving skills in the subject [25]. Their study determined that lectures should be followed by associated tasks, such as simulations and case studies, to provide optimal teaching of problem-solving skills. This highlights what Bremner [4] described as the "hybrid" practitioner. He asserted that no definitive answer exists regarding whether a teacher- or a learning-centered practice is most effective, but an appropriate combination of them, in relation to the contextual teaching situation constitutes the optimal approach. These arguments are followed by Farashahi and Tajeddin [25], who find that an equitable balance should be achieved of various kinds of pedagogical methods.

Studies have shown that implementing simulations in education will prepare students better for their professional future and give them better multi-competence [11, 25]. It is argued that the experimental learning processes in which students are situated during simulation tasks provide them with the opportunity to utilize theoretical skills in real-life situations. In such situations, students must make decisions and receive information regarding consequences [25]. The students also appreciate engaging in simulation tasks, as it improves their understanding of themes [26].

Reading for exams is vital for academic performance, and a study found that reading quizzes increased exam results by 4% [27]. It is also reported that the number of hours that students spent preparing for exams correlated weakly with the outcome of the exam, and a more important and effective factor was the way that the students worked [28]. This study revealed several activities in which students should not engage when preparing for exams, such as listening to music, using the Internet, and watching television [28].

In recent years, self-determination theory (SDT) has been developed by researchers globally to become a major theory of human behavior [29]. SDT asserts that if students experience support of three basic needs (i.e., competence, relatedness, and

autonomy) during their education, their intrinsic motivation, well-being, and academic effort will improve substantially [30, 31]. Pedagogical education on how to teach to support student autonomy advocates giving student tasks in which they have the possibility to choose how the tasks should be done, when the tasks should be executed, and whether the tasks should be completed at all [30]. If the teacher provides the students with autonomy, it will have positive effects on students' well-being, engagement, and academic achievement [2]. According to SDT, lectures should provide students with autonomy when teachers plan their teaching and prepare tasks for their students.

Research has revealed that gender differences can exist in preferred learning style in universities [32]. For instance, female students have reported higher intrinsic interest in their studies [33], and it is suggested that collaborate work be prioritized over competition in teaching to support female students who are more people-oriented than males [34]. Considering this research, the present study takes gender into account in terms of students' reported learning outcomes in different pedagogical methods.

The purpose of this study was to elucidate how students reflected on their own learning outcomes according to several pedagogical approaches, and what teachers should learn from these reflections. This knowledge is critical to discussions of the factors of which teachers should be aware in their own teaching practices. The research questions of the study were as follows: How do students report their learning according to different teaching methods, and do gender differences exist? What are the students' reflections on the advantages, disadvantages, and learning of teachers' different pedagogical approaches?

Material and Methods

Participants

The quantitative part of the study (questionnaire) included students from three different classes in a master's degree program in physical education (PE) in three consecutive years (2021, 2022, and 2023). At the time of the data collection, the students were in the middle of their five-year master's program. Moreover, the participants were well-acquainted with the selected teaching methods due to their experiences with them during previous years of study at the university. The participants received a verbal orientation about the purpose of the study. They were also informed that participation in the study was voluntary, and that they could withdraw from the study at any time without consequence. All the students that participated provided written consent in accordance with regulations of the Norwegian Center for Research Data.

In November 2021, five females and nine males filled out the questionnaire (77.8% of the class), eight females and 15 males (100% of the class) filled out the questionnaire in November 2022, and seven females and 15 males (100 % of the class) filled out the questionnaire in November 2023. In total, 59 students (20 females and 39 males) filled out the questionnaire, which yielded a response rate of 93.6%. The qualitative part of the study (interviews) included seven randomly selected students from the 2023 group (Table 1).

Table 1. Description of students participating in interviews (Master PE, third year)

Fictive name	Gender	Age
Ronny	Male	22
Celine	Female	23
Jessica	Female	24
Michael	Male	23
Monica	Female	22
Benny	Male	23
John	Male	24

Study Design

A mixed-methods design was used, in which questionnaire data were examined to determine students' learning outcomes in eight different pedagogical methods, and in-depth interviews were employed to obtain more nuanced knowledge about the advantages, disadvantages, and learning related to these pedagogical methods. The quantitative data were used to identify differences between male and female students' reflections of their learning outcomes in the eight pedagogical methods. The interviews, on the other hand, investigated advantages and disadvantages within each method, with the intention to determine what factors lecturers should be especially aware of in their own teaching according to these reflections. The study uses an *explanatory sequential design* [35], that starts with the collection of quantitative data, followed by the collection and analyses of qualitative data, to explain or expand the quantitative data. Integration of the data occurs through both *building*, where the quantitative data informs the data qualitative data collection approach of the other and *merging*, where the two databases are brought together for analysis [36]. Integration of the two databases at the interpretation and reporting level occurs through narratives [36]. The research was conducted at a small university, with class sizes ranging from 20 to 30 students. The study was approved by, and conformed to, the guidelines established by the Norwegian Centre for Research Data (SIKT, ref.

code no 383620), and is in accordance with the Declaration of Helsinki.

Description of the Different Teaching Methods

The research was conducted related to a course in a master's degree program in physical education (PE) (15 credits). Both authors had a pedagogical degree and a total of 52 years of teaching experience (32 years in universities). Based on this experience and education, the course was planned and executed using several different pedagogical methods that appear to enhance students' learning and engagement. These methods included:

- practical exercises led by the lecturer;
- reading to prepare for writing an academic text;
- discussions during lectures;
- lectures;
- writing an academic text;
- planning and executing exercises and lectures for peer students.

Furthermore, two additional pedagogical methods were included in the study:

- discussions outside lectures;
- reading for an exam, as these methods were considered relevant for learning.

The same lecturer provided the same educational content using the same procedure in the actual subject over three consecutive years (Table 2).

The instruction in the subject was meticulously planned, systematically organized, and executed in strict accordance with the curriculum. A description of the six methods used in the teaching of PE students follows:

1. Practical activities led by the lecturer are exercises based upon relevant theories. These types of exercises are combinations of doing practical exercises and discussions of the connection between theory and exercise.

2. Reading to write an academic text involved students searching for and selecting relevant research to plan and execute an individual training period of six weeks.

3. Discussions during lectures were facilitated by the lecturer, encouraging relevant discussions between two or three students, or by the lecturer posing pertinent questions to the students.

4. Lectures without discussions or questions indicated that only the lecturer was delivering the lecture.

5. Writing an academic text involved a task where students were required to compose an academic text that included a training plan, a description and evaluation of relevant tests, and a discussion of the outcomes of the training period.

6. Planning and execution of exercises for students are a teaching method that was organized by giving the students tasks to plan lessons for others based on the theoretical themes taught in the lectures. The students usually work in groups (4-6 students).

Table 2. Description of the use of six teaching methods in the course (the numbers correspond to the six presented methods above)

Week/subject	Monday	Tuesday	Wednesday	Thursday
34/endurance training	Method 4	Method 1	Method 1	Method 2
35/strength training	Method 3 and 6	Method 6	Method 6	Method 2
40/speed and plyometric training	Method 3	Method 1	Method 6	Method 2
42/training of technical skills	Method 4	Method 6	Method 1	Method 3
45/training of tactical skills	Method 3	Method 6	Method 6	Method 5
46/training planning	Method 4	Method 6	Method 5	Method 5
50/exam	Home exam for 3 days			

Procedures

Quantitative data on students' reflections regarding the learning outcomes of eight different methods were collected at three different times (2021, 2022, and 2023) after they completed a course in the fifth semester of their master's program in PE. The purpose of the questionnaire was to gather insights into students' experiences with their learning outcomes from the eight pedagogical approaches used in the course, which were:

1. Practical exercises led by the lecturer.
2. Reading to prepare for writing an academic text.
3. Discussions during lectures.
4. Discussions outside of lectures.
5. Writing an academic text.
6. Reading for an exam.
7. Planning and executing exercises for peer students.
8. Lectures.

The questionnaire was designed with a Likert-type scale between one and six, where six was the highest score. Likert scales are commonly used in questionnaire studies. A study showed that data quality, internal consistency, and discriminative validity suggest that Likert scales can be used in research [37]. According to each of the eight pedagogical methods the students answered the question: "What are your reflections according to your learning outcome in [...the actual method]?"

1. I achieve no learning outcomes from this method.
2. I achieve little learning outcomes from this method.
3. I achieve some learning outcomes from this method.
4. I achieve good learning outcomes from this method.
5. I achieve very good learning outcomes from this method.
6. I achieve excellent learning outcomes from this method.

We will argue that the questions related to each pedagogical method have a high face validity (that it is obvious what it is, i.e. reading for an exam). The survey was carried out in the same classroom

at the same time of year (November) at all three times (2021, 2022, and 2023), and the questionnaire was administered in paper format. A researcher was present during the data collection and was available to assist with any questions or difficulties that the students may have had filling out the questionnaire; however, no student had any such questions or difficulties.

The interviews of the seven randomly selected students took place in December 2023. The main purpose of the questions was to gain insight into the students' reflections on their experiences with the eight different pedagogical methods used during the course, as well as their perceptions of the advantages and disadvantages of these learning outcomes. The open-ended questions included:

- Can you explain an episode in your own schooling where you felt you learned a lot?
- Can you describe the way you learned and why you remember this episode well?
- Can you describe how you feel you learn during practical activities?
- Can you describe how you feel you learn in lectures?

At the end of the interview guide, two additional questions were included regarding the quantitative findings:

- The findings showed that the students identified lectures as the method that created the least learning. Were you surprised by this result, and what are your reflections about it?
- The findings showed that the students identified practical activities as the method that created the most learning. Were you surprised by this result, and what are your reflections about it?

In addition, one question was added to the questionnaire that did not directly concern teaching but rather dealt with academic discussions with fellow students or others. The intention was to determine whether this was regarded as an area that could provide positive learning effects for the students.

To assess the quality of the questions in the interview guide, a pilot interview was conducted with a randomly selected student in the same study as the participants in the present study. The pilot

interview showed that the interview guide led to many reflections from the students regarding their learning according to the eight different teaching methods and was not changed. During a 2-week period in December 2023, seven students were interviewed. A voice recorder was used during the interviews. All interviews were conducted at one of the researcher's offices, and the interviews lasted between 45 and 60 min.

Statistical Analysis

The students' responses to the questionnaires were analyzed in SPSS. The Kolmogorov-Smirnov test showed that all the eight dependent variables (the pedagogical methods) did not have a non-normal distribution of the variables ($p < 0.001$ in all). Moreover, since the scale used to measure the dependent variables did not meet the assumptions of parametric tests, O'Donoghue [38] point to the importance of using Mann-Whitney U-tests nonparametric tests to test for differences between two independent groups as gender.

Qualitative Analyses

The interview data were transcribed and entered in the qualitative analysis program NVivo 12 Plus. The analyses were based on the students' answers related to their reflections according to the use of the eight different pedagogical methods, in which students' perceptions of experiences were taken as subjectively true [39]. The data are based on subjective constructions that students verbalized when processing their own interpretations and reflections on what has occurred in PE at school. The interviews were transcribed verbatim and coded so that the participants were anonymized and given pseudonyms. The analyses were based on transcribed answers focusing on meanings, as described by [40]. Opinions and statements were assessed for themes, and then condensed, coded, and categorized in units of analysis [41]. In this process, the participants' statements related to each of the eight pedagogical strategies were assigned to codes that were classified into categories [42]. The data were sorted based on these categories to elucidate patterns, similarities, relationships, and/or differences between the statements. These analyses creating codes were conducted separately by both authors. The analysis and interpretation followed hermeneutical principles, in that the interpretation process led to an increasingly deeper understanding of the statements, in parts and in aggregate, in the interviews [43]. After both authors independently performed these analyses, the codes were discussed by the authors, and the final codes were created into main findings, as shown in Table 3. The discussions revealed that both authors had created the same codes, only using different words to explain the findings, which increases the reliability of the findings.

Results

Table 4 presents the descriptive quantitative data of the students experienced learning in different teaching methods, also according to gender. When comparing male and female students' reflections of learning related to different pedagogical methods, the results in table 4 show that males and females, in general, experienced approximately the same learning outcome in most of the eight different pedagogical methods. The statistical analyses also found no significant differences between males and females in terms of each of the eight pedagogical methods ($p > 0.05$).

The descriptive data concerning what percentage of the students reported no/some learning, good learning, or very good/excellent learning in eight different pedagogical methods are presented in Figure 1.

Figure 1 shows that, in general, most students reported good or very good/excellent learning outcomes in seven of the eight different pedagogical methods. However, in terms of lectures, 39% of the students reported no or some learning, while 33.9% of the students reported no or some learning in terms of reading for an exam. On the other hand, practical exercises, writing an academic text, and discussions during lectures exhibited the lowest number of no or some learning (1.7%, 10.2%, and 15.3%, respectively).

The analyses of the interview data will be presented next according to students' in-depth reflections of learning, and the findings will be discussed in terms of the advantages and disadvantages of teachers' use of the eight different pedagogical methods that were examined.

Lectures

The analyses of the interview data of the students' reflections revealed that lectures possess the potential to constitute an effective teaching method. John described his experiences of lectures as follows: *"I think it's fine. It's not fantastic. It's not bad. Based on the assumptions, I think it is most motivating to have lectures if it is something completely new."* This was followed up by Ronny, who stated: *"When the lecturer has good knowledge, it could give me new perspectives and good learning on the subject."* However, according to the students' reflections, efficacy related to learning and reflections concerning lectures depended greatly on the lecturer. The students not only highlighted the importance of the lecturer's knowledge-level in the actual subject but emphasized the lecturer's ability to provide an interesting lecture, as well.

However, the students also identified certain disadvantages of lectures, as highlighted by Celine:

If the lecturer has made a PowerPoint presentation and talks about and reads what is written on it for 45 minutes, we easily "fall out". Furthermore, if the

Table 3. Categories identified in the qualitative analyses related to advantages and disadvantages of different pedagogical methods.

Pedagogical approach	Advantages	Disadvantages
Practical activities led by the lecturer.	Motivating to be physically active. Relates to future work. Theories should be tested/highlighted.	It must be related to theories. It must be time to discuss theories.
Reading to be able to write an academic text.	Learn a lot. You choose what is important. Go deeply into things.	Much to read. Sometimes it is difficult to understand. Challenging at the start.
Discussions during lectures.	Skills exchange. Easier to understand. Challenge your own assumptions. Provides reflections.	Depends on the teacher's/student's motivation. Others must contribute to the discussions. Discussions can be derailed on other aspects.
Discussions outside of lectures.	Important for more learning. Others may understand more. More viewpoints. Confirm own thoughts.	Others must contribute to the discussions.
Writing an academic text.	More deep learning. Choose something you have an interest in. Provides reflections. Easier to see connections.	You are on your own. No discussion. It must plan the work. Difficult to find sources.
Reading for an exam.	May give learning. Connect theory and practice. Can and should be combined with other methods.	May start reading too late. You do not remember all you read. Sometimes it is difficult to see connections.
Planning and execution of exercises for students.	Get different viewpoints. Repetition of theories. Relates to future employment as a teacher. Group work could be educational.	It takes a lot of time. Social loafing during group work.
Lectures	It depends deeply on the lecturer. Must involve students in discussions. Get good references and relevant theory.	It depends deeply on the lecturer. It is often long-winded and boring.

subject presented is perceived as having little relevance to a future teaching job, it is easy to lose concentration.

Other students described some lectures as challenging due to a high academic level. They feel that the lecturer does not take their recent knowledge into account, and the lectures are experienced as too academically difficult. Jessica explained: *"If it is teaching about a theory that you have no prior knowledge of, it is difficult, I think."* The students also described the importance of their understanding of the connection between theories presented in lectures and the relevance for their teacher

education. Michael explained his experiences of education mainly as lectures: *"If there are too many theoretical lessons, and when you're finished with one topic, a new topic starts, this results in our easily forgetting all that we have heard."*

Discussions during Lectures

The students identified several advantages of discussions during lectures, including both discussions with the lecturer and discussions with other students during class. Monica stated: *"As soon as there is a lecture where we discuss and maybe work in groups and things like that, I learn a lot more than*

Table 4. Descriptive data of male and females experienced learning in different teaching methods

Variables	Male	Female	Z-Value	p-Value
Lectures	3.9 ± 1.0	3.9 ± 1.1	-0.110	0.913
Practical activities led by the lecturer	5.0 ± 0.8	4.9 ± 0.9	-0.207	0.836
Discussions during lectures	4.5 ± 0.9	4.5 ± 1.2	-0.332	0.740
Discussions outside of lectures	4.3 ± 1.0	4.6 ± 1.3	-1.084	0.278
Planning and execution of exercises for students	4.2 ± 1.0	4.1 ± 1.1	-0.593	0.553
Writing an academic text	4.6 ± 0.9	4.8 ± 0.8	-0.765	0.444
Reading to be able to write an academic text	4.3 ± 1.2	4.3 ± 1.2	-0.273	0.785
Reading for an exam	4.1 ± 1.1	4.5 ± 1.5	-1.477	0.140

Values are expressed as means ± standard deviations.

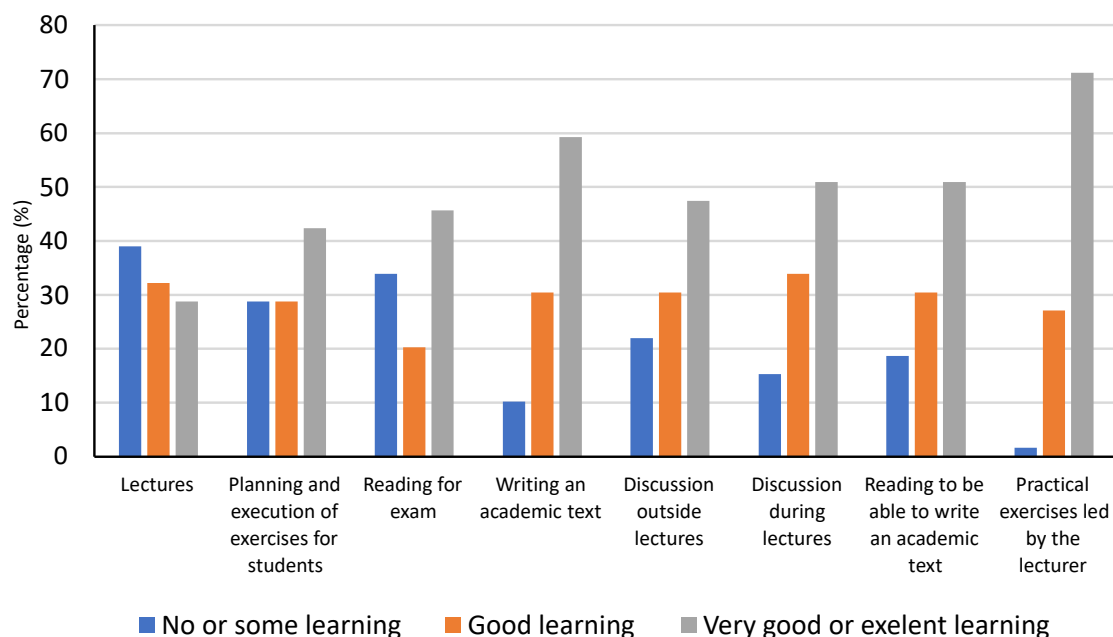


Figure 1. All students self-reported learning outcomes according to eight different pedagogical methods (%).

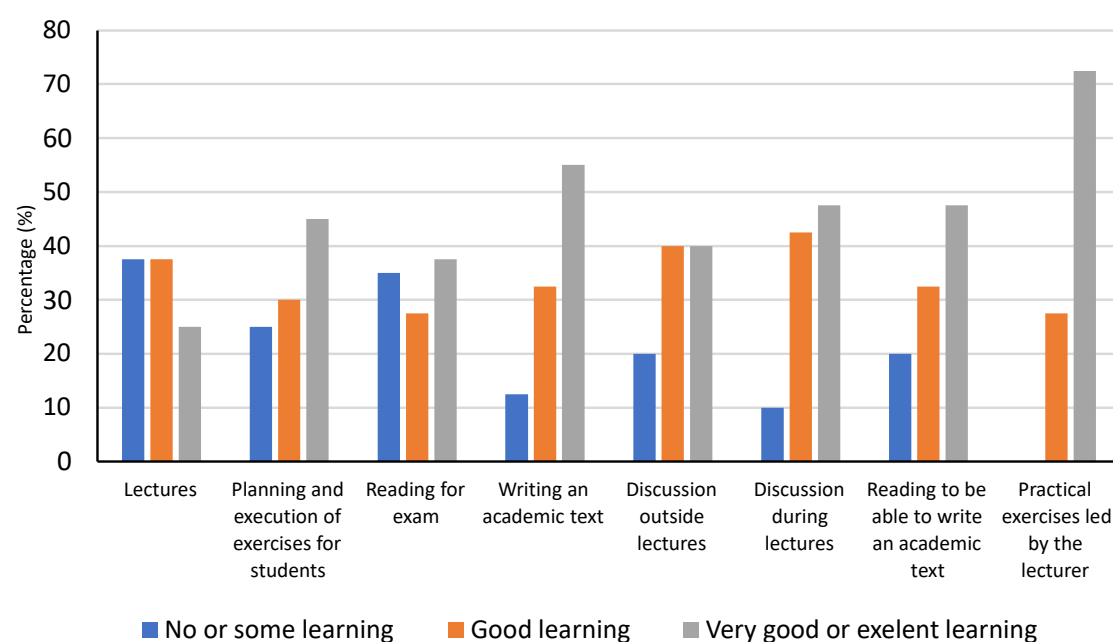


Figure 2. Male students self-reported learning outcomes according to eight different pedagogical methods (%).

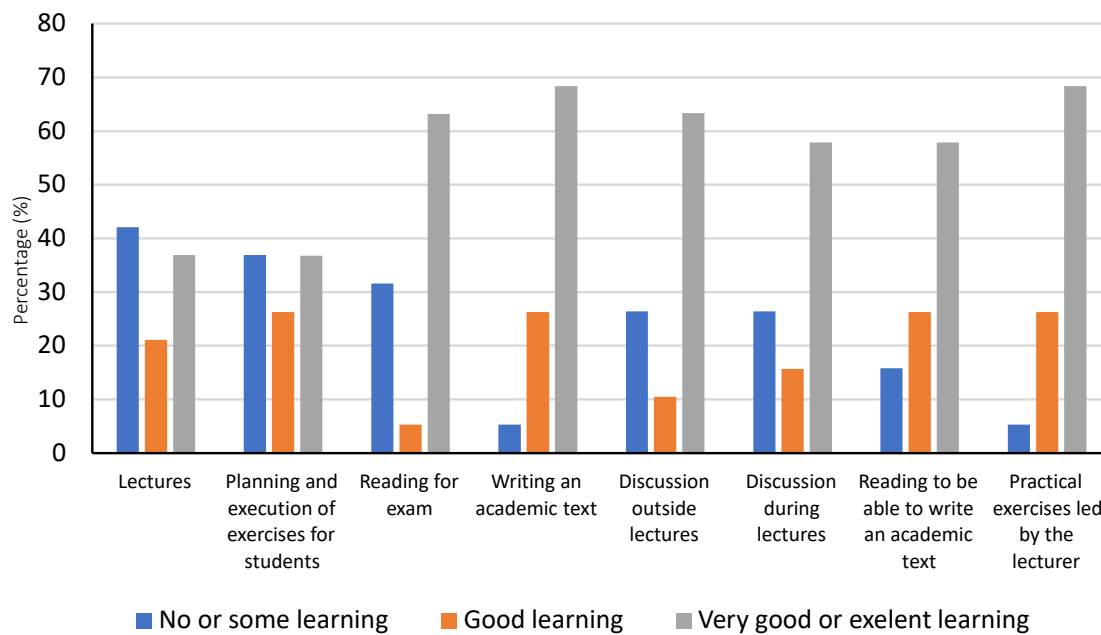


Figure 3. Female students self-reported learning outcomes according to eight different pedagogical methods (%).

just sitting and listening.” The analyses indicated that the students appreciate these discussions because they can constitute an exchange of experiences and knowledge between the students and between the students and the lecturer. They feel that the lecturer facilitates better reflections when the students are involved during the lectures. Ronny explained this:

When the lecturer asks questions and involves the students in discussions, I feel that we understand the connection between theory and practice better. There are often people in the classroom who are saying interesting things that I have not thought about, and then I think “That was an interesting comment or question.” When you participate in a discussion about professional issues, I think the learning is better than that obtained just by attending the lecture.

Although the students mainly evaluated discussions during the lectures as being positive, they also reported certain disadvantages with this approach. Firstly, the efficacy of this approach was stated as being dependent on the motivation of both the lecturer and the students and, without involvement, the method will fail. Secondly, the students reported some other challenges with the discussions, e.g., if the lecturer does not lead the discussion in a pertinent and productive direction, the discussion can become diverted towards other aspects.

Practical Activities led by the Lecturer

The students highlighted several advantages with practical activities led by the lecturer. Practical activities were identified as being well adopted by the student group, as they were more interesting, and the movement was enjoyed more than sitting in

lectures. Michael described this: *“I think that, for us, it is easier to learn when we are active, compared to sitting reading by ourselves, especially if you have dyslexia or have difficulty concentrating.”* Furthermore, the students emphasized how practical activities facilitated interaction between the lecturer and the students, and this method provides the students with an understanding of how theoretical aspects can be beneficially utilized in real-life situations. Benny explained:

The advantage of having practical experiences after the lectures is that the theories that have been reviewed in lectures are put into a context. It becomes easier to remember, perhaps not the concepts, but the main elements. For me, personally, it is much easier to remember when I have done something practical, when I have experience with what we talked about in the lecture.

Furthermore, in the students’ opinion, the practical activities do not produce any learning outcomes unless they understand the connection between the theoretical aspects and the activity. Michael described what the lecturers should do to enhance learning in practical activities:

The lecturers should plan enough time after the practical session to talk about it and relate it to the theory. Sometimes, we just have a session, and then we forget the theory. The lecturer should set aside maybe a quarter of a session to talk about what we have done, to focus on the connection between the lecture and the practical activity.

Discussions outside of Lectures

All the students reported that they have discussed relevant professional issues with others

outside of the school, such as with parents, peer students, siblings, boy/girlfriends, and former teachers. The students described these discussions as important, and as an activity through which they frequently obtained other points of view and were able to consider and adopt new perspectives. Jessica described her strategy:

A classmate and I usually work together on schoolwork. When we struggle with something, we tend to argue back and forth to get the other person to understand. When we realize it, it's a bit funny. If one person understands it, she can explain it to the other, and then she will also understand it. We think it works, because then we get it from a different angle.

Regarding discussions outside lectures, Benny stated:

Both my parents are teachers, and they are very physically active. It is interesting to come home and discuss professional issues with them, because you have a different perspective on things than Mum and Dad.

Although students reported a few disadvantages of discussions outside of lectures, it was asserted that, to provide learning potential, the other person had to contribute to the discussion with pertinent knowledge.

Planning and Executing Exercises for Students

The students' responses about planning and executing exercises were positive. Several important advantages were identified in terms of relevance for future employment as a teacher. This method also revealed a repetition of theories, and the students expressed different viewpoints. Celine explained this: *The advantage is that we get to go through the same theory many times, and we get to see how other students choose to present what we have talked about, and you get to see different points of view on it.*

Other students highlighted its motivational aspect. They asserted that since they were PE students, practical lessons were always interesting and motivating for them. Ronny pointed to the relevance of planning and executing exercises for students during education related to future employment as teachers:

That's exactly how it will be when we get to work, too, in that you have an idea that something should function and you try it out, and when the lesson is finished you know what worked well or not.

The students also stressed that for this approach to produce good learning, the connection to theory was crucial. Furthermore, discussions and feedback from the lecturers after the lessons were mentioned as decisive for enhancing learning outcomes.

According to the students' reflections, there were also some disadvantages of this method. The main problem with this approach was, according to the students, the organization of collaborative work in groups. The students described group work as a potentially efficient method, but their experience

with this approach was not only positive. John estimated that in half of the groups in which he had taken part, the groups functioned badly, and it yielded a poor learning output. Celine elaborated:

"The efficacy really depends on who you're in the group with. If your peer students are equally interested or more interested than you, the outcome will be good."

The students' organization of collaborative work is also viewed as problematic by Michael:

"The tasks are often organized as one person takes a piece of the task and then another takes another piece. Then, you will be very good at your part, but the rest of the task will be a bit unclear from your side."

The students also expressed that the methods of planning and executing exercises for students were experienced as positive, but the lecturer should pay attention to the length of the lessons. If the lessons were too long, it could lead to physical fatigue and decreased motivation within the group.

Writing an Academic Text

The students' reflections about working with and writing an academic text indicated several positive outcomes. Michael explained:

"I think there are many advantages to this task, everything from searching for articles to being critical of them. I have learned many things within the chosen sport, and for my part about plyometric training. I have learned a lot through reading about the subject and implemented this knowledge myself."

Jessica stated that for her, who is a soccer player, choosing a training intervention in soccer gave her high motivation:

"When I can train something relevant to soccer, then it is something I want to improve. Also, it was appropriate to train at this time of the season, and it allowed me to do it properly, even though I didn't make any progress on the tests."

The comments from others point especially to the importance of the 12-week deadline for finishing the task, in that it facilitated deep learning. Ronny described his work process:

"This task made you do research yourself, read articles. And then, it is very nice to have the discussion part at the end, where you get to reflect on how the entire training intervention has been and discuss the results. It was a very nice task, I think."

The students reported a few disadvantages of writing an academic text. Anne, however, identified one negative aspect:

"If I were to point out a small disadvantage of this task, it could be that you sit alone a lot and work. You don't get any discussions."

Reading to be able to write an Academic Text

The students reported some challenges in searching for relevant articles for their academic text in the beginning, but this improved quickly. Celine described this:

"Yes, the task [to write an academic text] has given me challenges, but it hasn't been so difficult

that I will never be able to do it. It has made me think, 'Where I must sit down and find relevant articles and read them?' At the beginning, I thought it was difficult because research my God, but now, research yes!" [enthusiastic].

Others emphasized how a large degree of autonomy in the task, in which they could choose a sport and exercise related to their interests, affected their effort. Indeed, this enhanced their motivation to read articles, and it provided them with new information about issues on which they were working. Anne appreciated this method for reading, and stated:

"An advantage is that you can choose what to read. You don't need to read everything, I'll pick out the most important, and then you decide yourself what is most important in the article."

John followed up on this:

"Searching for articles and reading them online has been educational. You get a better understanding about how others have thought when they have done research."

The students also identified some disadvantages of this type of task. For example, it was stated that the amount of research available is enormous, and it was challenging to find what they were searching for. Furthermore, the use of academic language, technical terms, and different statistical analyses in the articles could be problematic for the students.

Reading for an Exam

The PE students reported different experiences related to the learning outcomes of reading for an exam, and the efficacy of it. John explained:

"In the short term, I will be able to reproduce what I have read in the exam. In the long term, it really depends on how I have read. If I read the book from cover to cover in a subject where we must reproduce, I remember little afterwards. If there are subjects that can be discussed, I learn more from it and remember more afterwards."

Jessica expressed that, for her, the curriculum could sometimes be academically difficult:

"Reading, myself, can also be difficult because you don't understand the basics. Then, it can be difficult to build on."

In addition, Benny explained how the context between the curriculum and a future job as a teacher should be obvious to improve his reading effort:

"When I read something because I will use it, it is fine. But I can quickly get tired of reading without having used it before or will use it."

Some of the students also reported dyslexic challenges, indicating that their reading speed was low, and they experienced that using different methods for preparing for the exam was better for them than just reading. Jessica explained this:

"When I read and take notes, I can go back. This way, I understand a little more. I also make cards, which are used for repetition, so that I can explain to

myself again and again. I think this works well, and I use slightly different methods."

Some of the students also identified reading as a method they did not appreciate, as Anne stated:

"I think it gets a bit boring when I sit down to read certain things, subjects that don't catch my interest. Then, it feels like my concentration lasts for five minutes."

Discussion

The main findings of this study overall were that most of the PE students experienced good learning outcomes according to the eight pedagogical methods, and no significant gender differences were found. According to previous literature that identified gender differences in preferred learning style in universities [32] and other research pointing to gender differences in student motivation [33] and orientation [34], this finding is somehow surprising.

The analyses of the in-depth interviews supported the quantitative findings and pointed to both advantages and disadvantages of all the eight teaching methods. This finding is in accordance with Biesta [1], who described education as a highly challenging activity, because the students are different in terms of prior knowledge, motivation and effort, and there are no decisive pedagogical approaches which always comprise optimal assumptions for learning. The findings highlight that efficient teaching is related to what and how the lecturer plans and executes his or her teaching in relation to the student group, and that the best learning does not always take place in the classroom but could also occur outside of it [3].

The findings in Figure 2 show that all male students reported good, very good, or excellent learning outcomes from practical exercises led by the lecturer, while the females reported lower learning outcomes; however, no significant differences were observed. The students also appreciated the combination of lectures and practical exercises, which improved their learning of theoretical aspects. In fact, this use of different methods to facilitate deep learning is highlighted as vital for good teaching in another research [3]. The students reported a few disadvantages with this approach, if the lessons did not become too long and resulted in physical fatigue and decreased motivation.

As a part of the task of writing an academic text, the students searched for and read scientific articles. Since this task was largely autonomic, in which the students could choose both sport and exercise type, they reported high motivation and effort in the task. This finding is in accordance with self-determination theory (SDT), which holds that if students experience support of autonomy, enjoyment and academic effort increase [2, 30, 31]. This finding is also consistent with Ribeiro-Silva et

al. [11], who argues that higher education should use active learning methods to a substantially great extent to develop this multi-competence within students.

In the students' opinion, the learning outcomes of the lectures depended on the lecturer. Specifically, it was stated that when the lecturer had good knowledge, new perspectives and good learning were achieved. This finding is in line with Opdal [12], who described lectures as a relevant arena for cognitive activation of students. However, the students in our study experienced some of the lectures as being at an academic level that was too high, which led to low learning outcomes because they did not fully understand the content. This finding highlights the importance of well-paced teaching to reach all the students [3]. The students also reported that the organization of the lecturer affected their leaning and motivation and emphasized the importance of interactions between them and the lecturers, using questions and discussions. The importance of increased student involvement has also been reported in other investigations [7, 8, 9].

During the interviews, all the students stated that discussions and breaks during lectures constituted distinct advantages for their concentration and learning. These findings are in accordance with other literature that focuses on lectures as a teaching approach in higher education [10, 11]. The students in our study expressed that they wanted to be involved and activated, which would increase their learning outcomes. According to the PE students' reflections, the main disadvantage with lectures occurs if the lecturers fail to capture the attention of the students [43] and present an uninteresting lecture. This finding is also reported in other studies, and because many students feel bored at universities, a change in teaching has frequently been proposed [18, 19].

All the students stated that they discussed professional issues outside of lectures and emphasized numerous advantages with this approach. For instance, it could result in more learning, especially if the discussions were with people who possessed good knowledge of the subject. Students could also obtain better insight into other viewpoints and assess their own reflections. The mentioned disadvantage of this method was cases in which the person with whom they engaged in the discussion did not contribute relevant knowledge to the discussion. Based on the students' reflections, the lectures should encourage students to discuss professional issues with others outside of the lectures.

The students reported different experiences with the efficacy of reading for an exam. Some of the students also described reading for an exam as a challenge due to a diagnosis of dyslexia and a low level of concentration, especially in a subject that

they experience as somewhat irrelevant to their future employment as a teacher. These findings highlight the importance of using several methods and advising the students to use different methods in preparation for the exam.

The pedagogical approach of planning and execution of exercises for students was described as educational and relevant by the PE students during the interviews. According to the students, the primary advantage of this method was that the theory was tested in real life, and it was easier to understand the theoretical issues when they had experienced this. These findings are in accordance with Burdon and Munro [26], who reported students' appreciation of performing simulation tasks, because it improved their understanding of the theory. Relevance for their future job as a teacher was also highlighted as an advantage of the method. Other research identifies this approach of teaching as relevant for the development of professional knowledge, in which the students obtain experience making decisions, and then become cognizant of the consequences of these decisions [25]. However, the students pointed to one main disadvantage with this approach, which was the challenge of collaborative work, when the task was organized as group work. Even though all the students were positive about group work, they often experienced that some of their peer students took too little responsibility in preparation for the lessons. This finding is aligned with the theory of social loafing [44], as well as extant literature related to group work in universities, in which several aspects were identified as leading to low efficacy [22, 23, 24].

Strength and Limitations of the Study

The use of a mixed-methods design, including questionnaire data and in-depth interviews is a considerable strength of the study. The quantitative data also include data from students from the same course, but three different years – a strategy that decreases the possibilities for bias. However, there are some limitations. This study does not examine students' actual learning outcomes, but their self-assessed learning [45], and their reflections may not be in accordance with their actual learning outcomes [46]. Learning outcomes should ideally be measured using validated instruments such as knowledge-specific tests, accompanied by a pre and post testing procedure to ascertain the effectiveness of different pedagogical methods. In addition, the findings related to PE students' reflections of the advantages and disadvantages of the teaching methods were analyzed according to seven students' reflections, and thus cannot be generalized. Most of the participants, however, seemed to confirm the same main findings, which strengthens the credibility and reliability of the study.

Conclusions

An overall main finding of this study was that most of the PE students experienced good learning outcomes from all the eight pedagogical methods, and no significant gender differences were observed in any of the eight pedagogical methods. According to the analyses of the in-depth interviews, the students identified both advantages and disadvantages with all the methods. This indicates that lecturers should employ a range of methods and be cognizant of their specific disadvantages and find ways to limit them. The quantitative data also showed that lectures and reading for an exam were the methods in which the PE students experienced the lowest learning outcomes; whereas practical activities led by the lecturer and writing an academic text produced the highest learning outcomes. The analyses revealed that student-active methods (as practical exercises and writing an academic text) were assessed as appropriate by the students, as they provided a connection between theory and practice, were regarded as relevant for their employment

as a teacher and gave them high motivation. The students stated that lectures have the potential to be educational if the students are involved and the lecturer provides an interesting lecture. The findings of this study demonstrate that it is crucial for lecturers in higher education to attempt to implement different teaching methods and assess the students' reflections about them. Indeed, we conclude this is a reasonable approach to enhance students' involvement and engagement to achieve better teaching in universities. Further research should focus on actual learning outcomes produced by different teaching methods, in which the aim is to obtain deeper insight into how different pedagogical methods affect actual learning outcomes, and not only students' reflections about such outcomes. This could be accomplished with an experimental design that uses an intervention group and a control group.

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