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Antecedents of Student Teachers' Time-On-Task in Campus Activities in Denmark and Norway

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Abstract
Increased time-on-task is one of the overall goals for teacher education in both Denmark and Norway. However, student teachers' time-on-task in those programs are uncertain and highly debated indicators of research input. Researchers adopt this indicator with the expectation that student teachers must invest time and effort in their courses that are approximately equivalent to that expended during a standard workweek. The purpose of this article is to analyse the differences between Danish and Norwegian teacher education for elementary schools based on a uniform survey conducted in each country; more specifically, the survey queried student teachers' time-on-task in faculty- and student faculty-led campus activities. In this empirical study, we use survey data to examine factors that influence the duration of student teachers' time-on-task in Norway (n = 274) and Denmark (n = 1224). To meet the study's objectives, we conducted an ordinary least squares regression analysis and found that student teachers' self-discipline and perceived study demands are the most important exogenous factors in the duration of their time-on-task. The analyses led us to explore their implications for the structure of teacher education programs, particularly in terms of curriculum design and the articulation of academic expectations.

Key Words: Teacher education, Denmark, Norway

Introduction

Teacher education in Norway and Denmark

Norway and Denmark have a shared history of 434 years; in the late decades of the 18th century and in the 19th century, interest arose in teaching the children of common people (Markussen, 2022). The spread of teacher education and the nationwide coverage of teachers with training was more rapid in Denmark than in Norway (Larsen et al., 2011). Other than that, however, their development of elementary school teacher education had significant similarities until recent decades (Elstad, 2023).

The teachers' seminaries of old have made the leap to higher education, and over time the expectations for a tertiary, research-informed campus education has to a certain extent won the day. In Norway, this has been reinforced by the fact that elementary school teacher education is now presented in five-year master's programs (except for programs in practical and aesthetic subjects), based on the Finnish model (Ministry of Education and Research, 2017): the government has taken on major challenges in this

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area, including raising elementary teacher education to the master's level and tightening admission requirements. Danish elementary school teacher education remains a professional bachelor's degree that lasts four years and consists of 240 ECTS, although there has already been a discussion about whether 'once and for all' will give an idea of how teacher education in Denmark will become 'world-class' (Uddannelses- og Forskningsministeriet, 2019).

It is too early to assess the consequences of the Norwegian decision to add master's theses to subjects linked to school activities, but the Norwegian experience can be evaluated in the near future. A close examination reveals both similarities and differences between the Norwegian and Danish models. The most obvious similarity involves alternating between on-campus studies and internships in schools (known as 'practicums' in many countries). Danish teacher education operates with different subject designations like 'basic subjects', but there are relatively modest differences in the core content, although there are nuanced differences between different institutions' programs within and between the two countries (Harryson, 2018).

Norwegian teacher education environments for elementary schools are becoming part of universities at full speed, and it is now clearly expected that the teacher education staff will conduct research, as is standard at universities; indeed, many Norwegian teacher education institutions are already located in universities. What this will mean for the balance between teacher education's mission and broader academic missions remains unclear. In the Danish model, there are ambitions for a stronger knowledge base for teacher education (Udviklingsgruppen for Læreruddannelsen, 2021), but it appears that the authorities are looking for a pragmatically grounded balance between a professional and an academic orientation.

Student teachers' time-on-task

Adequate time-on-task is a critical aim for teacher education programs across the globe because it is directly correlated with improved learning outcomes: the more time student teachers spend actively engaged in learning activities, the more they absorb, understand, and apply knowledge and skills. This has been demonstrated in several studies relating time-on-task to academic achievement. Teaching is a demanding profession that requires a wide array of competencies. To adequately prepare student teachers for real-world classrooms, significant practice and engagement time is necessary. While increased time-on-task is beneficial, it must also be paired with high-quality and pedagogically sound instruction and activities to foster truly effective learning and skill development in teacher education programs. The purpose of the present article is to analyse the differences between Danish and Norwegian teacher education for elementary schools (grades 1–10) based on a uniform survey conducted in each country; more specifically, the survey queried student teachers' time-on-task in faculty-led and student faculty-led on-campus activities. In this connection, we focus on how the stu-

dent teacher's academic work as measured by time is divided between faculty-dominated teaching and study activities controlled by the student teachers themselves, whether individually or in groups. We see time devoted to a course in the various activities of teacher education as one way of operationalizing time-on-task, but we also examine the kinds of factors that are statistically related to time-on-task. In that context, we are concerned with the motivational orientation of student teachers, their self-discipline and how they perceive the demands placed on them in their studies.

Requirements for admission to teacher education

Multiple countries, including Denmark and Norway, have seen a decline in the academic achievements of individuals applying for teacher education programs, as per the European Education and Culture Executive Agency (2021). This trend prompted political action, resulting in the imposition of entry requirements for such courses. This strategic move by educational authorities underscores the necessity for applicants with strong qualifications to pursue teacher education programs.

However, the challenge lies in finding balance between substantial entry prerequisites and fulfilling municipalities' necessities for adequately competent teachers. Overemphasizing one can inevitably compromise the other. In Norway, firm grade-based admission criteria were lessened in 2022, acknowledging that the capacity of current teacher education programs could not be met with overly rigid requirements. Conversely, Denmark has adopted a pragmatic approach, integrating admissions interviews to pinpoint the most motivated candidates among those with lower grades, ensuring they can commit to and successfully concluding a teacher education course. Recommendations have been made to assess motivation through admission interviews and through written skills tests (Udviklingsgruppen for Læreruddannelsen, 2021). Supplementary proposals comprise implementing study commencement interviews and annual academic interviews for all student teachers. This current research endeavour is aimed at examining how student teachers allocate their time between faculty-led teaching and self-directed study. The goal is to provide valuable insights that could potentially guide future educational reform policy decisions.

Theoretical Framework

Existing knowledge, as measured by previous academic achievement, is believed to be only one crucial factor in the quality of an education (Karweit, 1984). The amount and quality of a student's effort during a course is also important, as is the quality of the instruction and practical guidance offered by faculty (Guillaume & Khachikian, 2011). In this article, it is assumed that time spent on study is an important indicator that is often referred to as time-on-task, which was also one of the themes formulated by the group established by Denmark's Ministry of Education and Research (with the participation of Danish Professional Colleges, Local Government Denmark, the

Danish Teachers Association and the Students Association). Here we examine time-on-task in teacher education programs and distinguish between activities guided by faculty and study that takes in groups or individually. We assume that the extent of these activities is influenced by motivational orientation, self-discipline and study pressure through work demands and the like.

Factors associated with student teachers' time-on-task

The extent of knowledge that student teachers gain from their education depends in part on the time and effort they invest in learning (Seidel & Shavelson, 2007). Professional commitment is a prerequisite for teaching and for translating knowledge into practice in teacher education. The present study investigates and compares factors that are statistically associated with student teachers' time-on-task in Norway and Denmark. A comparative study can provide a better understanding of issues and aspects that may not be evident in daily practice. The structure and content of teacher education depends on a deeper rationale that emerges as a result of cultural boundaries, and teaching is a cultural practice that differs across countries, sometimes significantly. Like the water in a fish tank, however, such cultural aspects are often invisible in debates over teacher education research (Blömeke & Paine, 2008). Although Denmark and Norway are neighbouring Nordic welfare states with significant similarities, they also differ in their approaches to schooling and teacher education.

Building on the insights of the British Educational Research Association (2014) and the foundational work of Blömeke and Paine (2008), our study strives to bridge the gap in quantitative research in teacher education. By undertaking a comparative analysis, we aim to illuminate the nuanced and often implicit ideological and structural underpinnings of teacher education in Norway and Denmark. Such a cross-national comparison is invaluable, as it provides a broader perspective that challenges provincial norms and expands our understanding of effective educational practices.

Exploring the differences and similarities between the two countries' teacher education systems enables us to speculate on the influence of cultural, socio-political, and educational variables. This, in turn, allows us to draw out potentially universal principles and context-specific strategies that are effective in the complex field of teacher education. Moreover, by employing a comparative lens, we set the stage for potential improvements in the teacher education sector. Such an approach can help identify best practices, foster international collaborations, and inspire educational reforms that are informed by a diverse array of experiences and research findings.

The ultimate goal is to elevate the quality and efficacy of teacher education programs globally and to ensure that future educators are well equipped to navigate and contribute positively to the evolving landscape of education in an increasingly interconnected world. An important contributing factor to understanding student teachers' engagement is their motivation regarding their studies (Roness & Smith, 2009). Social

cognitive theory has a significant position in educational psychology, and the concepts of motivation and self-regulated learning are very much in vogue. These theories often view education as a function of learning strategies, motivation, self-discipline, and metacognition, thus bridging multiple strands of psychological research (Pintrich, 2000). Other researchers (Ainslie, 2001; Heckhausen, 1977; Kuhl, 1985) emphasize motivation and self-discipline, as do we. We first address motivation.

Motivation

In general, motivation involves setting goals for one's actions. Research often distinguishes between intrinsic and performance-oriented motivation. The former refers to behaviour driven by external considerations, while the latter is the internal drive to perform a task regardless of external inducements (Deci & Ryan, 1985), such as a student teacher's desire for students to learn or a feeling that a subject is exciting. This line of thinking forms the basis of our first hypothesis (H1): Intrinsic motivation predicts the duration of student teachers' time-on-task linked to faculty-led and student-led activities.

For our research purposes, performance-oriented motivation is of particular interest; it is divided into numerous subcategories (Ashton, 1984). In teacher education, a student teacher's performance during teaching practice is assessed on a pass/fail basis. However, performance-oriented motivations to achieve a goal can also arise during a course, not just at the end of one (Ashton, 1984). How fellow students perceive a student's ability in a seminar or study group can have an impact on that student's motivational orientation. Several studies have shown that motivation for achieving goals has a significant influence on behaviour (Senko et al., 2011). Therefore, our second hypothesis is as follows (H2): Performance-oriented motivation predicts the duration of student teachers' time-on-task linked to faculty-led and student-led activities.

Self-discipline

Self-discipline is the willingness to consciously undertake, work towards and attain a specific learning goal, whether formally or institutionally defined or self-selected. Self-discipline is the mental faculty through which we impose an overall value of our own on the range of external pressures and temptations that act on us (Darling-Hammond & Lieberman, 2012). It is important that students can call on strategies to use conscious effort, supported by determination or external demands, to persist in their pursuit of learning goals, resist temptations and stifle impulses to abandon them in whole or in part. This effort is called self-discipline or willpower. Self-discipline is a permanent personality trait; however, no individual is completely locked into one set of traits. Except in extraordinary situations, everyone has the opportunity and ability to change some of their behaviour patterns. Thus, self-discipline can be viewed as a force within an individual that bears on his or her ability to complete a program, and

our third hypothesis is as follows (H3): Self-discipline predicts the duration of student teachers' time-on-task linked to faculty-led and student-led activities.

Perceived study demands

The factors considered thus far (motivation and self-discipline) can be viewed as characteristics of individual students. However, student teachers' time-on-task can also be understood as a response to the demands that a program places on student teachers (Darling-Hammond & Lieberman, 2012). Instructors can clarify their requirements through comments on student performance and required assignments. To identify the aspects of teacher education that generate effort in the form of professional engagement, we examine how such requirements and other mandatory activities imposed by universities and colleges are perceived during self-determined activities (e.g., individual studies). Therefore, our fourth hypothesis is as follows (H4): Perceived study demands predict the duration of student teachers' time-on-task linked to faculty-led and student-led activities.

Country differences

As outlined in the introduction, the present study examines and compares factors statistically associated with the duration of student teachers' on-campus engagement in Norway and Denmark. There are similarities and differences, which have been outlined above, between the two countries' teacher education systems. Our fifth hypothesis is as follows (H5): There are differences in the factors statistically associated with the duration of student teachers' time-on-task linked to faculty-led and student-led activities between Norway and Denmark.

Methodology

Measurement instruments

The questionnaire used in this study was developed using previous measuring instruments from the literature, with some new developments. The survey was conducted using a seven-point Likert scale, with the midpoint (four) representing a neutral position, and concepts were measured using two or three questions. The analysis in this report is based on five measurement instruments. Internal consistency as measured by Cronbach's alpha was satisfactory (see Table 1), indicating accurate measurement of the operationalized concepts.

Variables and indicators

Intrinsic motivation (IM) I want to become a teacher because ...

- Teaching is exciting
- I want others to become interested in learning

Performance-oriented motivation (PM) For me it is important ...
• To be looked up to by the other students
• To be referred to as the smart one at the studio
• To hear that others have a good impression of me

Self-discipline (SD)
• I usually complete study assignments well before the deadline
• Even if I set aside time for study work, I don't get it done
• I often put off what I have to do until the last minute

External academic pressure (HE) Compared to my secondary education ...
• The academic requirements are greater in teacher education
• I need more time to keep up with the faculty members' lectures

Time-on-task (TT2): Faculty-led activities
How many hours do you spend on the following study activities in a typical workweek?
- Lectures, group instruction and guest lectures (DK) / Lectures (NO)
- Dialogue-based instruction (DK) / Faculty-led seminars (NO)

Time-on-task (TT3): Student-led activities
How many hours do you spend on the following study activities in a typical workweek?
- Study groups (DK) / Student-led colloquia (NO)
- Individual study work

Samples

This research forms an integral component of a comprehensive investigative project that seeks to scrutinize an array of attributes and predilections amongst student teachers. Key areas of interest include motivational levels, self-regulatory capacities and the extent of perceived supervisory support. In the Danish context, questionnaires were disseminated across vocational colleges to an unspecified number of student teachers. A total of 1509 surveys were returned; 1224 were completed and suitable for subsequent analysis.

With respect to the Norwegian cohort, the original sample encompassed teacher trainees from both elementary educational institutions, totalling 635 participants. For the purposes of this specific study, the focus was narrowed to include only those in elementary teacher education programs, resulting in a subset of 274 individuals. Although the sample sizes for Denmark and Norway are of different sizes, that factor was not found to undermine the statistical significance of the study's findings. Nevertheless, it

is acknowledged that this variation in sample sizes could impact the precision of estimated statistical parameters, such as mean values.

Analysis

In this study, we use ordinary least squares (OLS) regression analysis to examine our samples from Norway and Denmark. OLS regression is a statistical technique that estimates the relationship between one or more independent variables and a dependent variable. In our case, we aimed to understand how the independent variables (e.g., intrinsic motivation, self-discipline, performance-oriented motivation, external academic pressure) impact the dependent variable, time-on-task.

After performing OLS regression analyses separately on both the Norwegian and Danish samples, we compared the resulting regression coefficients, which are numerical values that represent the changes in the dependent variable for a one-unit change in the independent variable, thus providing insights into the strength and direction of the relationships in question. By comparing these coefficients between the two countries and by studying the coefficients which reflects interaction, we aimed to identify any differences or similarities in the factors influencing time-on-task among their student teachers. This comparison of regression coefficients is a standard method for cross-national analyses because it provides a structured approach to assess whether the relationships between variables are consistent across different contexts or vary from one country to another. Countries may have different cultural, social, economic, and educational systems that impact the ways in which certain variables relate to each other. By comparing regression coefficients, researchers can understand the extent to which these contextual factors influence the relationships being studied. Regression coefficients allow researchers to quantify the strength of the relationship between variables on a consistent scale across different samples. Through the comparison of coefficients and the interaction coefficients, it is possible to identify interaction effects that may suggest a variable has a different impact in one country compared to another.

In the analyses below, we include the independent variables self-discipline (SD), intrinsic motivation (IM), performance-oriented motivation (PM) and external academic pressure (HE) in two analyses with different dependent variables; one uses faculty-led activities (TT2), and one uses student-led activities (TT3; see Table 3). To test our hypotheses, we have included country as an independent variable and the interactions between nation and each independent variable in both analyses. We conducted linear regression analyses to estimate the model's coefficients using the OLS method. These coefficients reveal the magnitude of the relationship between each independent variable and the dependent variable, holding all other variables constant. Additionally, our four-variable model incorporates interaction terms.

To facilitate interpretation of the interaction terms and provide results reflecting central tendencies, we centred the independent variables, which involves adjusting

each variable by its mean, resulting in variables such as centred self-discipline (SSD), which is equal to SD minus the mean of SD. The same process applies to SIM for centred intrinsic motivation, SPM for centred performance motivation and SHE for centred help from educators.

The interaction variables are then constructed by multiplying the centred variables by the nation variable (NA): SSD_NA for the interaction between nation and centred self-discipline, SIM_NA for nation and centred intrinsic motivation, SPM_NA for nation and centred performance motivation and SHE_NA for nation and centred help from educators. These interaction terms allow us to investigate whether the influence of the independent variables on the dependent variable differs by nation.

As we delve into the nuances of our research findings, it is imperative to establish the reliability of our measurement instruments. Table 1 presents Cronbach's alpha values, which are a key indicator of internal consistency within our datasets from Denmark and Norway. These values help to assess the degree to which the items within each scale correlate with one another, thereby providing us with confidence in the coherence and stability of our constructs across different responses. The constructs of interest (SD, IM, PM, and HE) vary in their alpha values, indicating differing levels of reliability.

Table 1.
Cronbach's alpha results

Denmark	Norway
SD=.76	SD=.83
IM=.69	IM=.72
PM=.61	PM=.77
HE=.77	HE=.83

Ethical principles

Our research was conducted with a firm commitment to adhering to the highest ethical standards, with the protection of participants' identities being paramount. We prioritized anonymity in our questionnaire, making it impossible for any responses to be linked back to specific respondents. This non-identifiable structure fostered an environment in which participants could respond candidly, thus bolstering the overall reliability of the data obtained.

Participants were given a clear and concise view of the study's scope, their involvement in it, the voluntary nature of their participation and the assurance that they could withdraw at any time without repercussions. In addition to preserving anonymity, we provided participants a strict guarantee of confidentiality, which reinforced our promise that their responses would remain exclusive to the research team and be used strictly for the expressed research objectives.

Maintaining these ethical principles in our study not only fortifies its methodolo-

gical rigor but also aligns our research with the generally endorsed ethical guidelines in educational and social science research (Hammack, 1997; Cohen, Manion & Morrison, 2017). It is incumbent on our research team to uphold these principles in all stages – from initial research design to sharing findings.

Findings

Descriptive statistics

The observed discrepancies in time-on-task between Danish and Norwegian student teachers, as detailed in Table 2, provide an interesting perspective on the varying educational engagements across the two countries. It is particularly noteworthy that Danish student teachers report higher time-on-task overall, with the most marked contrast appearing in the context of teacher-led activities. This distinction underscores the potential impact that structured, faculty-driven instruction may have on student engagement in the teacher education process.

Given that the only statistically significant difference lies in the domain of teacher-led activities (TT2), this suggests a strong influence of instructional methods on student time-on-task. This significant difference prompts further inquiry into the pedagogical approaches adopted in Denmark and Norway, possibly indicating that the Danish model of teacher-led activities is more effective in keeping student teachers engaged.

Furthermore, the significance of teacher-led activities may reflect broader differences in educational philosophies, resource allocations and/or curricular priorities between the two nations The implications of these differences could be far-reaching, informing how future teacher education programs are structured to maximize student engagement and learning outcomes.

It is crucial to consider the broader methodological and contextual factors that may contribute to these findings. For example, cultural nuances, the organization of teacher education and the support systems in place for student teachers could all play roles in influencing time-on-task. These elements merit detailed examination to fully understand and interpret the significance of the disparities revealed in teacher-led activities between Danish and Norwegian student teachers.

Table 2.
Descriptive statistics for time-on-task; teacher-led activities (tt2), and student-led activities (tt3).

	Dk: N = 1224		No: N = 274		Difference	
	Mean	SD	Mean	SD	Mean	SE
tt2	16.76	6.81	13.77	4.87	2.99 *	.35
tt3	14.98	10.61	14.20	7.60	0.78	.50

* $p < .001$

Table 3.
OLS regression with unstandardized coefficients centred continuous UVs.

	tt2: R^2-adj = .04				tt3: R^2-adj = .11			
	b	SE(b)	p	Tol	b	SE(b)	p	Tol
Constant	16.73	0.19	0.00		15.02	0.19	0.00	
ssd	0.52	0.13	**0.00**	0.76	1.48	0.14	**0.00**	0.76
sim	0.22	0.20	0.27	0.80	0.31	0.20	0.13	0.80
spm	0.15	0.14	0.29	0.68	0.02	0.15	0.87	0.68
she	0.13	0.13	0.30	0.79	0.75	0.13	**0.00**	0.79
na	-3.10	0.53	**0.00**	0.66	-0.83	0.55	0.13	0.66
ssd_na	-0.30	0.28	0.28	0.74	-0.29	0.29	0.31	0.74
sim_na	-0.09	0.47	0.86	0.78	-0.41	0.49	0.41	0.78
spm_na	-0.10	0.32	0.76	0.54	0.15	0.33	0.64	0.54
she_na	0.49	0.29	0.09	0.77	-0.32	0.30	0.28	0.77

*For values Tol (Tolerance)>.20 is considered acceptable and $p < .05$ indicates significant b. Teacher-led activities are here tt2 and activities led by the students are here tt3. Statistical significance is written with bold numbers.

OLS regression

When interpreting the results in Table 3, one must remember that Denmark is coded 0 and Norway 1. In addition, the coefficients for SSD, SIM, SPM and SHE apply when NA = 0 (Denmark). We test the difference between Denmark and Norway twice, one with separate analyses and one with interaction analysis. The results in Table 3 can be summarised as follows:

• For TT2, the results indicate that the coefficient for self-discipline (SSD = 0.52) is significant ($p < 0.05$). The relationship between SSD and TT2 is thus statistically significant in Denmark. When self-discipline increases by one scale unit (one hour), we expect Danish student teachers to spend around 30 more minutes on faculty-led activities per week.

• For TT2, the results indicate that the coefficient for country (NA = −3.10) is significant ($p < 0.05$) when respectively ssd = 0, sim = 0, spm = 0 and she = 0, i.e., for the mean. There is thus a difference in how many hours student teachers spend on faculty-led activities in Denmark and Norway. Danish student teachers spend just over

three hours per week more on faculty-led activities than Norwegian students. This result corresponds to the one obtained in Table 3.

• For TT2, no other coefficients come close to being statistically significant, with the possible exception of the coefficient for the interaction between external pressure and nation (SHE_NA = 0.49).

• For TT3, the results indicate that the coefficient for self-discipline (SSD = 1.48) is significant ($p < 0.05$). The relationship between SSD and TT3 is thus statistically significant in Denmark. When self-discipline increases by one scale unit, we expect that Danish student teachers will spend around 90 more minutes on faculty-led activities per week.

• For TT3, the results indicate that the coefficient of external pressure (SHE = 0.75) is significant ($p < 0.05$). The connection between SHE and TT3 is thus statistically significant in Denmark. When external pressure increases by one scale unit, we expect Danish student teachers to spend around 45 more minutes on faculty-led activities per week.

• For TT3, no other coefficients are close to being statistically significant.

Findings in relation to the hypotheses

The purpose of the present study was to examine the factors that are statistically significantly associated with student teachers' self-reported duration of time-on-task in Norway and Denmark. We formulated five hypotheses regarding the duration of student teachers' time-on-task. We focused on whether intrinsic motivation (H1), motivation to achieve a goal (H2), self-discipline (H3) and perceived study demands (H4) predicted student teachers' duration of professional engagement. In addition, we investigated possible differences between the coefficients for Norway and Denmark (H5).

Table 3 shows the unstandardized coefficients from the OLS regression with time-on-task as a dependent variable for TT2 and TT3. Both regression models predict only a small portion of the variance in time-on-task. The analysis indicates that students' self-discipline (H3) and perceived study demands (H4) are the most important predictors of the duration of on-campus time-on-task and shows no statistically significant correlations between either intrinsic motivation or self-determined performance-oriented motivation and student teachers' time-on-task, so H1 and H2 were not supported. The results also indicate a statistically significant interaction ($p < .05$) between country and faculty-led activities (TT2).

Two issues require further interpretation and discussion: first, the lack of a relationship between intrinsic motivation and duration of time-on-task; second, the non-significant relationship between motivation to achieve a goal and time-on-task. One interpretation concerns the expectations for students to attend lectures and seminars while conducting independent studies, such as familiarizing themselves with the national literature, preparing plans, creating presentations and conducting a certain amount

of research. There are tensions between academic self-study and effective cognitive activation via compulsory study requirements. In other words, the learning process of student teachers appears to be tightly controlled by strict deadlines and external incentives and consequences, which limit their space for activities of interest, feelings of personal significance and even the desire to receive recognition or achieve prestige (Archer, 1994). If a student values recognition and prestige (motivation to achieve a goal), he or she would likely invest more effort in preparing presentations and contributing to peer groups. However, the results might have been different if student teachers had more time to dedicate to questions about their preferences and what they find most interesting and challenging.

Furthermore, in the ECTS system, programs in both countries are divided so that an academic year corresponds to 1,600 hours comprised of 40 five-day weeks of 40 hours per week. Thus, student teachers spend much less time than is available for full-time studies. The low amount of study time required for teacher education compared to, for example, medical and architectural studies (Damen et al., 2016) is a topic for further focus.

The extent to which student teachers in both countries have the freedom to make active choices regarding their university studies is still not sufficiently known. There are subtle differences between teacher education in Norway and Denmark. For example, at a vocational college in Denmark, students choose their minor subjects but have little freedom to choose courses within those subjects. In Norway, students choose their subject program and have a certain freedom within that sphere. Another question is how instruction during lectures and faculty-led seminars and activities related to individual studies nurture student teachers' perceptions of their relevance to teaching practice during their internships.

It is possible that student teachers are intrinsically motivated to be teachers but are not inherently interested in their teacher education studies. On the other hand, students could be interested in questions about learning (or other educational phenomena) but unwilling to work as teachers. Either way, it is possible that students are motivated, at least in part, to enter a teacher education program to ensure that they will have reasonable job prospects. Thus, when evaluating teacher education, it is important to distinguish carefully between students' intentions. Because students can have low or high teaching intentions and low or high academic intentions, how to nurture both remains a challenge for teacher education programs.

On the other hand, the study's achievement motivation question focused on social admiration of academic achievement. The importance of social admiration supports the significance of this aspect of the social environment when studying, especially in teacher education programs, in which students meet regularly and get to know one another during their studies. However, the effect of achievement motivation is not large, and we acknowledge that the questions that focused on the importance of pro-

fessional goals in becoming a teacher may be a better predictor of time spent on study activities. For example, there is previous research on several non-cognitive attributes (Brunello & Schlotter, 2011) that are important in educational settings and could be used in future studies. Finally, more research is needed to improve content validity.

Discussion and Conclusion

The present study advances our grasp of factors influencing student teachers' time-on-task during both faculty-guided and self-directed on-campus activities in Denmark and Norway. The link between student teachers' self-discipline, an inherently personal trait, and their time-on-task is evident, affirming that individuals with higher self-regulation are more likely to invest time in their tasks. Conversely, intrinsic motivation's correlation with time-on-task appears to be tenuous.

The elementary objective of this study was to elucidate the factors associated with student teachers' time-on-task in Norway and Denmark. We articulated five hypotheses centred on intrinsic motivation, goal achievement motivation, self-discipline, perceived study demands and cross-national differences in these determinants. Our findings indicate that self-discipline and perceived study demands significantly influence time-on-task, whereas intrinsic motivation and the motivation to accomplish goals do not serve as reliable predictors. Finally, an interaction effect was observed between country context and the nature of faculty-led activities.

Shortcomings and avenues for further investigation

Like all studies, this one too has its shortcomings, which include its parsimonious modelling strategy and its use of a single-time-point research design. It is imperative to acknowledge the potential threats to the external validity of our study due to potential non-representativeness of our samples (Cohen, Manion & Morrison, 2017). Additionally, our study faces threats to its internal validity. Comparing educational statistics from two different countries and treating the comparison as a quasi-experiment is a complex process and can be challenging due to several factors. A quasi-experiment is a research design that attempts to establish cause-and-effect relationships but lacks the level of control or randomization found in true experiments. Any conclusions about cause-and-effect relationships should be drawn with strong caution, clearly stating the limitations of the comparative approach and the potential for uncontrolled confounding variables. Had we employed randomized controlled trials, our conclusions regarding causality would rest on a firmer empirical foundation. Therefore, when we speak of 'impact,' we must be cautious and consider this limitation. In truth, our evidence does not explicitly confirm causality, but rather indicates statistical correlations (Cook, Campbell & Shadish, 2002). Nevertheless, these constraints can also lay the groundwork for subsequent inquiries.

Although we chose a quantitative method to investigate the factors affecting the

on-task duration of student teachers, there exists the potential for broader investigations utilizing qualitative methodologies (Cohen, Manion & Morrison, 2017). It is worth noting that the quantity of quantitative studies examining student teachers' engagement with tasks has been somewhat scarce, resulting in a lack of solid data-driven underpinnings in this domain (Godwin et al., 2021).

A further shortcoming relates to the dependency on self-disclosed survey information, which is by nature open to personal interpretation (Burkhauser et al., 2002). Although third-party evaluations could contribute significant perception into teacher performance as suggested by Boxall & Purcell (2011), maintaining privacy in such evaluations presents its own set of difficulties. In addition, we did not have the opportunity to validate the self-reported information from the student teachers with hard evidence of their task-related performance. Several questions remain unanswered and are thus avenues for further investigation. Notably, could the teaching of self-discipline strategies or the modification of institutional arrangements lead to increased time-on-task? Additionally, the effect of perceived high study demands on time-on-task warrants closer examination, as does the way institutional arrangements might bolster time-on-task by nurturing motivation.

Our research did not explore the relationship between time-on-task and student teachers' performance outcomes, such as course grades or learning progression, and we recognize that our study only considered a selected array of factors. Future research could benefit from incorporating a more comprehensive theoretical framework that encompasses a broader range of nuanced variables, potentially accounting for a greater proportion of variance in time-on-task. Subsequent studies could more closely examine the interplay of motivation types, the impact of different instructional designs on engagement and the potential correlation between time-on-task and student achievement.

The study reveals two pivotal concerns for extended discussion: the apparent disconnect between intrinsic motivation and time-on-task and the lack of observed impact from goal-achievement motivation on time-on-task. These findings suggest that student teachers' learning pursuits are heavily influenced by the rigid structure of deadlines and extrinsic rewards, thus potentially constraining their engagement in intrinsically driven and personally meaningful activities. Moreover, it is highlighted that the study burdens associated with teacher education programs are relatively modest compared to other fields, which may limit student teachers' autonomy in their educational choices. In light of these considerations, the inherent structure of teacher education programs and the potential to cultivate environments more conducive to autonomous, intrinsically motivated learning activities emerge as critical areas for future exploration and policy development.

Conclusions

The findings call for a deeper understanding of the learning environments in teacher education programs, with an eye towards enhancing the efficacy of the time that student teachers spend on task. Teacher education institutions would benefit from incorporating strategies that foster self-discipline and scrutinizing and possibly recalibrating study demand perceptions to optimize student teacher engagement. These institutions could consider actively integrating self-management training into their curricula (Gollwitzer & Oettingen, 2020). Workshops or course modules dedicated to time management, goal setting and self-monitoring could be valuable in helping student teachers develop the self-discipline and implementation intentions necessary for success in their studies and future teaching careers.

Additionally, it is crucial for teacher education programs to continually evaluate and align their study demands with realistic expectations. This alignment could involve balancing workloads, offering flexibility in assignments and providing adequate support resources. By fostering an academic culture that encourages wise time management rather than an unsustainable workload, institutions can help student teachers may become more engaged and less prone to burnout.

The call for a more nuanced appreciation of educational settings also implies that teacher education programs should strive to create a more personalized learning experience. This could include a variety of teaching and assessment methods that cater to diverse learning strategies and needs, thereby potentially increasing academic engagement and time-on-task. Moreover, our findings suggest that further qualitative research might elucidate the subjective student teacher experiences of time-on-task, including the aspects of their education that students find most engaging or challenging. This could lead educational stakeholders to reconsider not only the quantity of time allotted to various activities but also the quality and relevance of those activities to student teachers' professional development (Godwin et al., 2021).

To put these recommendations into effect, teacher education programs should engage in ongoing dialogue with student teachers, faculty, policymakers and educational researchers. Collaboration across these groups is essential to ensure that time-on-task is not merely a quantitatively measured expectation but a qualitatively rich component of teacher preparation that truly prepares educators for the dynamic and demanding nature of their profession.

This study offers several key findings and suggests practical implications to enhance the quality of teacher education programs. Most significantly, it shows that a student teacher's self-discipline, a predominant personality trait, has a substantial association with time-on-task during both faculty-led and student-controlled activities. This insight could be valuable for educators and policymakers looking to augment student teachers' time-on-task. Crafting strategies to hone self-discipline and implementing institutional arrangements that promote it could be valuable steps towards

boosting time-on-task (Gollwitzer & Oettingen, 2020). The ultimate goal remains to refine teacher education practices to produce highly skilled, motivated, and effective educators equipped to meet the demands of 21st-century classrooms.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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