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Student teachers′ basic psychological needs and motivation underlie the experiences of educational quality: A pre-registered qualitative study

Lucas M. Jeno [a,*] [iD], Chantal Levesque-Bristol [b], Jorun Nylehn [c], Zeljana Pavlovic [a], Dag Roness [a], Netta Weinstein [d]

[a] *Department of Education, University of Bergen, P.O. BOX7800, 5020, Bergen, Norway*
[b] *Purdue University, 155 South Grant Street, West Lafayette, IN, 47907-2114, USA*
[c] *Department of Biological Sciences, University of Bergen, P.O. BOX7800, 5020, Bergen, Norway*
[d] *University of Reading, Box 217, Reading RG6 &AH, Windsor Hall, Upper Redlands Road, Reading, RG1 5JL, UK*

A B S T R A C T

This qualitative pre-registered study was designed to investigate student teachers' motivational experiences concerning educational quality from the lens of Self-Determination Theory. Experiences of educational quality have large implications for learning and wellness and educational quality is incorporated in the law of study regulation. Through four separate focus groups, we interviewed a total of 18 student teachers from either first-year or fourth-year Norwegian teacher programs on their experiences of educational quality and the satisfaction of their basic psychological needs and motivation. Our deductive thematic analysis showed that the psychological needs for autonomy, competence, and relatedness, as well as autonomous and controlled motivation, underlie the experiential qualities of students' understanding of educational quality. Specifically, we found that relatedness was a protective factor in the experience of persistence and wellness in the teacher program, whereas competence frustration led to feelings of having a high workload. Finally, autonomous motivation was experienced as vital for continuing teacher education, whereas pressure and feelings of compliance increased the students′ sense of controlled motivation, which resulted in feelings of wanting to drop out. Although our study had some limitations, our results provide important implications for how study programs can be organized to create better integration of the program to enhance satisfaction of basic psychological needs. Furthermore, our pre-registration of this qualitative focus group interview study is a major contribution to this area of open science within Self-Determination Theory and qualitative methodology in general, which is still nascent.

1. Introduction

The experience of having a "high-quality education" is important for students learning and wellness in higher education (Gibbs, 2010). In particular, when it comes to a complex study program such as teacher education (Hansén et al., 2012), quality is a concern (Skagen & Elstad, 2023) as student teachers across Norway are experiencing adverse effects and dropping out of their study programs (Bakken, 2022; Elstad et al., 2023; Høgheim & Federici, 2022; Liu & Sitoe, 2020). What constitutes educational quality has long been debated, yet the idea of elevating educational quality remains essential for many stakeholders (Falch et al., 2022; OECD, 2008). In this respect, four dimensions are regarded as important hallmarks of educational quality: student-active learning, an aligned educational program, relevant education, and appropriate workload (Barnett, 1992; Biggs & Tang, 2011). For instance, previous studies have consistently shown the importance of student-active learning (Freeman et al., 2014), alignment of education (Biggs, 2003), relevance (Johansen, Eliassen, & Jeno, 2023), and

workload (Karjalainen et al., 2008) for multiple outcomes.

However, according to Self-Determination Theory (SDT: Ryan & Deci, 2017), for these four dimensions to be true indicators of high educational quality, they need to be accompanied by the experience of basic psychological need satisfaction. In line with SDT, psychological need satisfaction and motivation (i.e., processes) are considered important for increasing outcomes such as learning and wellness. This sentiment is also echoed by scholars who differentiate between the process and outcomes of quality (e.g., Harvey & Green, 1993; Hovdhaugen et al., 2016), suggesting that constructs such as teaching and learning environment and motivation are crucial for understanding the outcomes of quality (Nerland & Prøitz, 2018). According to SDT, high-quality education is characterized by a teaching and learning environment that satisfies basic psychological needs and facilitates autonomous student motivation (Ryan et al., 2023). When students experience satisfaction of their basic needs, they report high-quality motivation, which has been shown to be related to a range of beneficial outcomes such as achievement, vitality, positive affectivity,

persistence, and effort (Howard et al., 2024). Although educational quality remains an important factor that needs to be increased, there is a paucity of studies that have looked specifically into the motivational underpinnings of student teachers' educational quality from an SDT perspective in a higher education context (e.g., Ryan et al., 2022). Thus, to further contribute to the literature and address this knowledge gap, the main aim of this study is to investigate student teachers' experiences of educational quality in higher education from an SDT perspective through qualitative analysis. To guide our work, the following research question was posed: "How do student teachers' experiences of basic psychological need satisfaction and motivation reflect their perception of quality within their teacher education?"

1.1. Basic psychological needs and motivation

According to SDT, the teaching and learning environment can support students' motivation, learning processes and wellness by satisfying the students' basic psychological needs for autonomy, competence, and relatedness (Ryan et al., 2023). The need for autonomy is conceptualized as feeling a sense of freedom to behave in ways that are personally valued and desired, a sense of choice that allows one to do so, and a sense of agency – that one stands behind one's own behavior. The need for autonomy is expressed when students experience flexibility in terms of self-initiation of their behavior and meaningful choices (Deci & Ryan, 1987). In contrast, a lack of autonomy satisfaction is experienced when the teaching and learning environment shows rigidity or puts pressure on the students. The need for competence is defined as feeling effective when interacting with the environment. The need for competence is expressed when students are experiencing an optimal amount of challenge or can display mastery by progressing or improving in a learning activity (Ryan & Moller, 2017). On the other hand, when the teaching and learning environment is unable to structure the tasks or provide learning guidance along the way to master the challenges presented, students may feel less efficacious in mastering such challenges or obstacles. Relatedness is conceptualized as being cared for, a sense of belonging with others, and caring for others. Relatedness is expressed when students are in trusting relationships, groups, or organizations where they can relate to each other and collaborate openly and authentically (Weinstein & DeHaan, 2014; Deci & Ryan, 2014). Conversely, students experience a lack of satisfaction in relatedness when they are in situations where there is competition or group conflicts, or when the students feel lonely.

When the students experience satisfaction of their psychological needs, the students' motivation is characterized by self-endorsement, volition, and choice. Within SDT, this form of motivation is considered autonomous and regarded as a high-quality form of motivation. Autonomous motivation can either be fully self-determined as when a behavior is intrinsically motivated (e.g., enjoyment, inherently rewarding), or partly self-determined when a behavior is regulated by identification (e.g., personally important, valuable) (Ryan & Deci, 2017). Unlike, when basic psychological needs are not satisfied or even frustrated by over-challenging or pressuring students or making them feel rejected or isolated, their motivation moves towards control (Bartholomew et al., 2011; Vansteenkiste & Ryan, 2013). Such controlled motivation is regarded as low-quality because behaviors are regulated by external factors (e.g., acting predominantly in response to either external or internal pressures such as rewards, or threats of punishment) or introject regulation (e.g., acting to avoid guilt or attain pride and self-esteem) (Ryan & Deci, 2017).

Recent studies have shown that, to the extent that students' motivation is primarily autonomous, positive outcomes for both learning and well-being follow. For instance, a recent meta-analysis showed that, in the educational context, autonomous motivation is associated with positive behavioral, cognitive, and affective outcomes (Howard et al., 2021). Specifically within higher education, recent studies have shown that autonomous motivation predicts persistence (Messerer et al., 2023),

engagement (Ito & Umemoto, 2022), transfer of knowledge (Levesque-Bristol, Richards, Zissimopoulos, Wang, & Yu, 2020), and achievement (Alamer & Alrabai, 2022; Wang et al., 2022). In contrast, controlled motivation is linked to less desirable outcomes, and has been shown to increase test anxiety (Iraola-Real et al., 2022) and reduce vitality (Jeno et al., 2021), amongst other things (for a review, see Howard et al., 2021).

1.2. Linking Self-Determination Theory to educational quality

The literature within SDT linking basic psychological needs, motivation, and educational quality is scarce, and, to our knowledge, no research exists on what constitutes a high-quality education. The SDT literature discusses the concept of "flourishing", which is a developmental concept focusing on the factors required for growth and wellness (Ryan et al., 2023), as a sign of "quality". Although the idea of what constitutes educational quality is debated (e.g., Harvey & Green, 1993), it is commonly argued that relying too heavily or solely on performance indicators (i.e., outcomes) is a misleading view of educational quality (Barnett, 1992), and focusing on educational processes is also important (Gibbs, 2010). Taking process factors into consideration is important when assessing quality in higher education because only focusing on outcome indicators shows a small predictive value (Falch et al., 2022); Nerland and Prøitz (2018). The conceptualizations of educational quality as both process and outcomes are not too dissimilar from the idea of flourishing as defined within SDT. Building on this and given that SDT focuses on flourishing as an important indicator of "high-quality" education, we provide theoretical justifications for the linkage between psychological need satisfaction, motivation, and educational quality.

In the present study, we argue that students will experience higher educational quality as a function of the satisfaction of psychological needs and autonomous motivation. The general proposition is that the experience of psychological need satisfaction leads to higher quality motivation (autonomous motivation), which in turn will lead to higher educational quality. For instance, SDT has long argued for the importance of environmental and contextual factors for students' motivation and educational outcomes, mediated by basic psychological needs (Vallerand, 1997). That is, how the higher education context affects students' motivation, which in turn will impact educational outcomes such as learning, wellness, and persistence, is dependent upon the students' experience regarding their basic psychological needs. SDT argues that satisfaction of psychological needs is important at each level of analysis, with downward implications (Deci & Ryan, 2011). For instance, at a distal level, an institution's focus on high stakes or performance will affect how the institution is organized and how much support is allocated for student learning. This will in turn impact student motivation negatively due to the lack of autonomy (e.g., pressuring students), competence (e.g., poor learning strategies), and relatedness (e.g., competition among students) satisfaction (Pelletier & Sharp, 2009). Even at a proximal level, if the organization of a teaching lesson or learning activity is unstructured and chaotic, the students will experience a lack of need satisfaction, which will have implications for the student's interest and enjoyment (i.e., motivation) in that given moment.

Finally, from a theoretical point of view, autonomous motivation should be related to higher education quality because, as opposed to controlled motivations, autonomous motivation is characterized by greater positive emotions, persistence and involvement, and a sense of personal importance as a motivational force (Koestner & Losier, 2002), presumably because their basic psychological needs have been satisfied (Ryan & Deci, 2017).

In sum, although evidence for the link between psychological needs, motivation, and educational quality is limited, we argue that, from a theoretical stance, there should be a connection between these factors. We argue primarily that the satisfaction of basic psychological needs is an important prerequisite for the experience of having a high-quality

education. Although, in certain domains such as education, one of the needs may take precedence over the other (Levesque-Bristol, 2021), SDT proposes that satisfaction of all three needs are necessary for learning and wellness (Ryan & Deci, 2020). Thus, to the extent that students experience low or high educational quality, this is theorized to be a function of basic needs satisfaction, yet given the educational context, one of the needs (e.g., competence) may be more proximal to the students' experience of certain aspects of educational quality. Further, satisfaction of basic psychological needs is a necessary path for high-quality autonomous motivation, which is required for fulfilling the educational demands of higher education. Finally, to the extent that students experience basic psychological need satisfaction and autonomous motivation, in line with SDT, we assume that beneficial outcomes will follow, including more engagement, meaningful and relevant learning, better wellness, and more persistence.

1.3. Study context

The current study was conducted in Norway among student teachers on a five-year teacher education program. The teacher education program consists of 300 credits' (ECTS) worth of courses, and students get their master's degree in the subject of their choice, and didactics, pedagogy, and practice are an integrated part of their program (Ministry of Education, 2013, 2015). The program includes two academic subjects (Subject 1 and Subject 2) combined with didactics, pedagogy (general didactics), and discipline-specific subjects. The students are required to complete 160 ECTS in Subject 1 and a minimum of 60 ECTS in Subject 2. Furthermore, they also need 30 ECTS in didactics, 30 ECTS in pedagogy, and 20 ECTS in discipline-specific subjects. Finally, there are 100 days of practical experience at schools (Ulvik et al., 2023). Their master's program is connected to Subject 1, and the students can choose between a subject matter or a didactics-oriented master's thesis. Four faculties at the university cooperate on the integrated teacher education program. The student teachers attend classes in their chosen subject and their didactics at the faculty related to their professional affiliation. In the pedagogy classes, all student teachers study together. The education is provided through large lectures, smaller seminar groups, independent study, and finally, through practical training, individually and in pairs, in both lower and upper secondary schools.

There is a diverse range of definitions of quality (e.g., Harvey & Green, 1993) and different perspectives on quality (e.g., Tam, 2001), and what constitutes educational quality is to some extent legally established in Norway. Thus, in the current study we draw on the legal definition of quality in studies and education that each institution is expected to provide student teachers in Norwegian higher education. According to the Study Inspection Regulation (www.lawdata.no), higher education legislation states that there are specific requirements that each study program in higher education in Norway has to fulfill. According to the official legal definition, each study program need to 1) allow students to take an active role in the learning process, 2) adapt the study content, program structure, and infrastructure to the learning outcomes in a coherent fashion, 3) be relevant for the student's future work life, and 4) have an appropriate workload, which in Norway is between 1500–1800 h a year.

Based on this legal regulation of quality, we operationalize educational quality around the following areas: student-active learning, coherence between subjects in the teacher education program, educational relevance to the teaching profession, and workload.

There is some preliminary evidence that supports our theoretical line of reasoning regarding the importance of satisfying basic psychological needs for these dimensions of educational quality as stated in the legal definition of quality. For example, student-active learning has been found to enhance motivation (Jerez et al., 2021) and engagement (Jeno et al., 2017), as these can help build bonds and enable effectance-relevant feedback, thereby supporting relatedness (Escandell & Chu, 2021) and competence (Ryan & Moller, 2017), respectively.

Furthermore, a recent study found that enhancing relevance and alignment between content and teaching, increased students' autonomous motivation, which in turn was a predictor of wellness and persistence in the learning activity (Johansen, Eliassen, & Jeno, 2023). Finally, a high-pressure workload has been found to be related to a lack of basic psychological need satisfaction (e.g., Basson & Rothmann, 2017).

Thus, some indirect evidence links SDT and educational quality, proving a new and important research avenue for investigating how basic psychological needs and motivation are expressed in educational quality.

2. Methods

2.1. Participants

Participants ($N = 18$) consisted of student teachers drawn from the humanities and natural sciences faculties from a large university in Norway. Participants were drawn from a purposive sample (Cohen et al., 2011), either from their first or their fourth year in the teacher program. See Table 1 for full sample characteristics and distribution. Selection criteria were based on differences between first-year and fourth-year students in dropout rates and educational experiences of the teacher program (Bore et al., 2019). We conducted four focus group interviews. Our sample size was based on Hennink and Kaiser (2022), which found that four focus groups are needed for code saturation, especially given our deductive and theoretical approach. Each focus group interview consisted of 4–6 students, because this range has been shown to be optimal for focus groups (Kitzinger & Barbour, 2001). We opted to use focus groups because we were interested in the possibility of participants sharing and discussing different experiences and thoughts about quality in their studies and education, something which is not feasible with individual interviews (Moser & Korstjens, 2018).

2.2. Procedure

We conducted four separate focus group interviews. The participants were placed in focus groups based on faculty affiliation and year in the teacher program. All students signed an informed consent form before starting the interview. We employed a semi-structured interview guide, and the same guide was used across all focus groups. The interview guide was developed by all the authors (see Appendix), based on SDT's conceptualization of the basic psychological needs for autonomy, competence, and relatedness, and the difference between autonomous and controlled motivation. Furthermore, questions concerning educational quality were developed based on the operationalization of the legal definition of educational quality described above.

Each focus group interview lasted approximately 1 h and was

Table 1
Sample characteristics.

Variable	n(%)
Study year	
First-year	9 (50%)
Fourth-year	9 (50%)
Faculty	
Humanities	7 (39%)
Natural sciences	11 (61%)
Disciplinary primary subjects	
English	1 (5%)
Religion	4 (22%)
Spanish	2 (11%)
Mathematics	5 (28%)
Biology	3(17%)
Chemistry	3(17%)

Note: $N = 18$.

recorded and then transcribed verbatim by the fourth author. The focus group interviews were led by the first and fourth authors. Participants were given a food gift card (worth 150 NOK = ~14 USD) for participating in the study.

Ethical considerations were addressed by providing the participants with the appropriate information for them to provide their informed consent, giving them time to ask questions after the interviews, and anonymizing the audio recordings after transcription. We removed any mention of personal characteristics to increase the anonymity of the participants.

2.3. Methodological design and analytical strategy

The present study was pre-registered prior to data collection, and this pre-registration is available at the Open Science Framework (https://osf.io/r5stn/). The pre-registration contains a-priori information about the research aims and question, sampling strategy, study design, data collection, interview guide, analytical plan, and credibility strategy. The pre-registration was based on the template provided by Haven et al. (2020). Two discrepancies from the pre-registration were that we omitted member checking and triangulation of data collection. These were omitted due to a lack of feasibility of conducting this extensive moderation process.

We used thematic analysis with a deductive approach to analyze our data (Braun & Clarke, 2006). Thematic analysis was chosen because it is flexible and allows us to use a theoretical framework and apply a deductive analytical approach to answer our research question(s).

The following steps were conducted in the analysis to ensure fidelity with a deductive approach to thematic analysis (Braun & Clarke, 2006, 2020). First, two of the authors read the transcripts to examine and familiarize themselves with the data. Second, initial codes were generated and defined within either psychological needs, motivation, or educational quality. After reviewing these major themes, we identified subthemes within each major theme. This process was repeated, and codes that did not fit the major themes were collected to identify new themes and subthemes based on their patterns of meaning. Finally, the authors discussed the identified themes and subthemes, and the names and meanings of the themes.

Methodological integrity was ensured through consensus building among authors, multiple researchers collecting and analyzing the data, and triangulation with other data sources. We used NVivo 12 as the software to code the data, as its strength lies in its ability to manage data and code and to achieve breadth in data analysis (Mortelmans, 2019).

3. Results

Below, we present the results from our thematic analysis. The themes, subthemes, and frequency of codes from the analysis are also presented. The quotes illustrated below capture the themes and subthemes that were discussed across the focus group interviews and represents multiple student voices. Table 2 depicts the results from students' experiences of basic psychological need satisfaction and motivation, whereas Table 3 summarizes students' experiences of educational quality and structural issues of the educational program. In general, we found support for the basic tenets of the importance of basic psychological needs for autonomy, competence, and relatedness for educational quality. Furthermore, we also identified themes revolving around wellness indicators and structural issues of the students' program. We first present the findings regarding the basic psychological needs and motivation, and then the results of students' experiences of wellness in the educational program and structural issues of the program.

3.1. Basic psychological needs

Results show that students experienced both need satisfaction and a

Table 2
Themes and subthemes of basic psychological needs and motivation.

Themes and subthemes	Frequency
Theme 1: Autonomy	
Flexibility and choice	50
Theme 2: Competence	
Challenge and efficacy	27
Structure	23
Theme 3: Relatedness	
Cared for and belongingness	39
Collaboration	5
Loneliness	13
Theme 4: Autonomous motivation	
Motivation to become teacher	9
Subject interest	7
Motivation to persist	24
Theme 5: Controlled motivation	
Pressured experience	17
Motivation to persist	17

Note: The frequency denotes the number of codes that came up during the analysis across the four interviews. In all themes and subthemes, codes were analyzed from all four focus group interviews.

Table 3
Themes and subthemes of structural factors.

Themes and subthemes	Frequency
Theme 6: Educational quality	
Student-active learning	19
Coherence between subjects	60
Educational relevance	67
Educational workload	87
Theme 7: Well-being in program	
Affectivity	35
Stress	14
Theme 8: Structure of the program	
Program workload	9
Program coherence	12

Note: The frequency denotes the number of codes that came up during the analysis across the four interviews. In all themes and subthemes, codes were generated from all four focus group interviews, except for theme 8, in which the codes were generated from three focus group interviews.

lack of need satisfaction of all three of the psychological needs. Across all three psychological needs, when students report satisfaction of their psychological needs, the experience is reported as more positive. In contrast, when the students report a lack of satisfaction of their psychological needs, the experience is reported as more negative.

3.2. Autonomy

The analysis reveals one major subtheme that spoke to the need for autonomy, flexibility and choice. The students voiced experiences of having few choices regarding their education or their perspective being taken into consideration. This is illustrated by one student:

"Such as exam forms […] last year for (one exam) everybody disagreed, even the lecturer disagreed that this was a good exam form […], they asked for feedback at the end of the semester, how we found it, and I hope they take that into consideration and fix things, but I did not get the impression that we were heard, nothing was done really, we could not organize a better exam."

In general, the students experienced that they had few options in the program, which they viewed as a negative, specifically in terms of choosing different subjects or topics to study. This negative experience may be due to the lack of autonomy satisfaction. On the other hand, students discussed how instructors were able to show flexibility in their educational context, which they viewed as a positive, which may be

since this supports autonomy. As another student said:

"We had a teacher in our first year for (the course), and she was going to have us in our second year too. She starts the class the same way as previously, and realized that she recognized some of the students […], she asked what we wanted to learn about instead, we said how to teach (the course) in a high school environment, she said ok […] it was the closest thing we had ever had to an actual class in the school practicum."

The only time the students were able to express freedom and self-choice was in regard to managing their workload, though they either had the choice to work harder or aim for a lower grade. When asked what they could do to have control over their workload, one student said: *"work a little bit all the time"*, whereas another student said: *"You can always choose to go for lower grades in a way"*.

3.3. Competence

For competence, we found two subthemes, challenge and efficacy, and structure. Several students mentioned feeling overly challenged, specifically in relation to the workload in their program. This is exemplified by a student who said: *"we still had a lot of articles left, and it was sort of every week, so it was very overwhelming, and then it's like no, I give up, I won't even try"*. Some students also mentioned that challenges lead to them not feeling efficacious when tackling such challenges. The experience of being overly challenged combined with low efficacy was related to feelings of stress and a lack of competence satisfaction. As one student said:

"I feel like there is a lot that's just thrown in now, especially after the practicum; there is a lot that must be thought about and analyzed and produced […], it's a bit stressful to come out of what is supposed to be the experience of being a teacher and then just get a 'by the way you need to produce a text here, you need to produce a text there, you need to produce a text there, produce text, produce text,'; you don't get to process what has gone well, and what has gone less well."

Further, when analyzing the data, we found that a major subtheme within competence was structure. Specifically, the subtheme of structures was linked to students' experience of information and guidance. As another student said:

"I feel that the information is bad, honestly, in the teacher education program when it comes to the choices you can make, maybe I would have felt that there was more freedom in choosing if there was more information about what you could do."

When talking about structure related to guidance, one student expressed that they feel competent because there is a clear path and structure as to how to create this lesson plan, stating:

"We make a lesson plan […], which we have done since our first didactics lesson, then we do a teaching session and split it up, and we get a very good understanding of why you do that activity before you do the other activity […] everything makes sense in a way."

3.4. Relatedness

As for relatedness need, students talked about the importance of others and how feeling cared for and a sense of belonging were essential for wellness and maintaining motivation for their education. As one student explained:

"I would say that I am doing well, but that is because I am with people that I care for, and we sit and we talk together and comfort each other, and we back each other up, but I am – have never been as stressed in my entire life."

Another student explained that: *"Without each other, it would not have been possible"*. Although not a very prominent subtheme, students reported that there was a culture of collaboration among the students, and this was tightly linked to the experience of relatedness, as one student put it: *"But we work together a lot, and we complain to each other, which helps a lot"*.

In contrast, some students experienced relatedness frustration, which manifested as loneliness. As mentioned by one student:

"I have gotten to know people, like you (another participant) in lectures and seminars, but I have not, I know only a few people, so I don't feel like there is much unity, at least that – I don't feel like I am a part of like a collective group of student teachers."

This feeling of loneliness was mainly driven by lack of fully integrating the program as a whole, and how students felt compartmentalized, as explained by one student:

"I miss a proper classroom feeling because, compared to the teacher education for fifth to tenth grade, they are together as one class the entire time, they have their classes together which seems nice, but we have one or two classes together during the year, and then we are just spread out and mixed with the other study programs."

3.5. Motivation

In terms of motivation, we found patterns of both autonomous and controlled motivation and some differences between the first-year and fourth-year students.

For autonomous motivation, we found three subthemes in our data. When talking about what it is like being a student teacher, several students stated that it was fun, specifically when they could "feel" like a teacher during their practicum. They felt more like a teacher which contributed to a sense of relevance. In terms of differences between study years, our results showed that for fourth-year students, autonomous motivation was evident due to taking part in practicum, which made them feel like teachers. In contrast, first-year students felt less autonomous motivation because they had to take very theory-focused subjects (and not much pedagogy). This in turn reduced their feeling of being a teacher, which took a toll on their autonomous motivation, which was exemplified by a fourth-year student:

"Those semesters where the majority (of classes) is subject material, not practicum or pedagogy that don't – you don't feel like a student teacher in a way, but when you have practicum and pedagogy and didactics, then I feel like I have extra motivation to learn […], the feeling of being a student teacher is most evident when you have pedagogy and practicum I think."

This was further exemplified by a first-year student:

"It was a bit stupid that there are no [didactics-courses] in first year really, it could be that lots of people drop out because they don't see the point, or they lose their motivation for it."

A strong subtheme that we uncovered in the data was autonomous motivation to persist in their teacher education program. When asked about their motivation to continue their program one student said: *"I want to be a teacher, so I'm not going to quit, I'm motivated to keep going, but it's more my own motivation that I have from a desire to complete my education"*. However, this autonomous motivation fluctuates and is also dependent upon the environment. As one student said: *"My intrinsic motivation fluctuates in line with how interesting the study is, study load and sense of mastery and stuff like that, it fluctuates up and down"*.

For controlled motivation, the results show that students encountered a number of external factors that made them remain on their programs, and that this form of motivation was experienced with a sense of pressure. One student explained:

"I can't drop out now because I will be left with nothing, we don't have a single degree, even if we have studied for almost 4 years, so I guess it's that that motivates you to work – these four years will have been wasted in a way". Yet another student said:

"I have to say for me it's maybe just extrinsic motivation rather than intrinsic motivation, like when you have started something like student loans and everything like that, I should complete the program."

3.6. Educational quality

In our analysis, we identified the subthemes of the four dimensions of educational quality as: students' role as active learners, coherence between subjects, educational relevance, and educational workload. The least prominent subtheme was students' role as active learners. Students reported that a major hindrance for active learning was large lectures. The students stated that being able to be active in class had a positive impact on learning and competence satisfaction. As one student noted: *"[when active] That's when I feel like I learn something from the class, it's like, being able to work with it while I learn about it in a way makes me actually learn something."*

For coherence between pedagogics, didactics, and the teaching subjects, the students reported that it was difficult to understand the connection between these subjects, specifically, between the theoretical subjects of their choice, and their applicability to being a teacher. As one student said: *"I feel like the connection disappears a bit when we only have subject material classes, so now, I almost forget that I am supposed to teach this to others as well"*. This is closely related to the experience of feeling that their education is relevant for the actual profession of teaching. Some students reported that the knowledge they gained from some of the subjects was too advanced for what they were going to teach the students, especially when the didactic subjects were unable to make it relevant to the practical teaching. This was true for both theoretical subjects (e.g., biology, religion) and pedagogy (i.e., theoretical theories and models). However, students also referred to topics and seminars, and practical experiences, which helped them see the relevance of the theory.

The most prominent subtheme revolved around educational workload. Students experienced a high workload, which was viewed as negative and was tightly linked to a lack of competence satisfaction and controlled motivation. This experience was a function of a lack of coherence within the program, but also too much content and too many activities in the program (and courses). The students reported feeling overly challenged, and persevered because they felt they had to. To the extent that students were able to reduce their workload, it was due to individual teachers or study counselors showing a degree of flexibility and acknowledging the students, and not because the students themselves could reduce it. As one student reported:

"I find that I am never able to keep up, there's always something you have to read, there is always something you have to write, there is always something you did not manage to do and that is also difficult, especially when we have other – I have (other classes) as well; it gets a bit much."

3.7. Well-being in program

Two subthemes (i.e., stress and affectivity) were identified concerning well-being within the program. Although some of these subthemes were interrelated, they were still distinct in terms of their major themes. For instance, at a personal level, the students reported high levels of stress and negative affectivity as a function of their workload and lack of coherence within the program. As one student summarized:

"How are we supposed to start working afterwards, because now I'm so tired, fantasizing about a year where I just do nothing to bring myself back again, everything takes more energy because I don't have any energy to call on."

On the other hand, several students experienced positive affect and reported having fun in their program, especially before starting a period with an intensive workload or having just finished this period. For some, positive affectivity and a sense of fun were due to satisfaction of their relatedness need, as noted by two students:

"I think I'm doing well on the teacher program, but I don't feel like that has to do with the teacher program, I feel that it has to do with social circles, people you meet," and *"I think so, because I've found a good group, social group I'm in."*

3.8. Structure of the program

The final major theme that we found in our data revolved around the structure of the program. We found two subthemes within this larger theme. One subtheme concerned issues around program workload, where we found a difference between first and fourth-year students specifically related to organizational issues in the program, which led students to experience high levels of pressure and stress. Fourth-year students discussed how the organization of the different courses within the teacher education program was an issue in terms of workload and negative experiences. As one fourth-year student noted:

"I end up having three oral exams in the same week, it's absolutely crazy, how is that possible? You have so many weeks to choose from and there is no possibility to change the date because, no, the others already picked those dates, sorry you missed that deadline because you were on practicum and didn't have the time to be checking your email 24/7."

In contrast, this was not as strong of a theme among first-year students. One noted:

"I think there could have been more academic material, more mandatory reading, I actually think there is too little on the curriculum."

Whilst another said:

"With those courses where there are no mandatory assignments […], it is completely up to you if you manage the workload or not."

Another related example was the lack of integration of the practicum that the students had to complete, yet for which they received no formal credits. The students found that this added even more pressure to their workload, as one student explained:

"We have 100 days of practicum over the course of four years, for which we receive zero credits. We are doing a six-year program in five years, and it is so silly that it has been set up this way."

Finally, a subtheme we found concerned program coherence. In particular, students experienced this lack of coherence and integration of different courses and subjects as a negative. The lack of coherence in the program resulted in the lack of relatedness satisfaction that many students felt. As one student stated:

"That's what's a bit difficult with the teacher education program […], we are very spread out, and then you also maybe don't have a very … well, you don't really have that much attachment amongst the student teachers."

4. Discussion

This pre-registered qualitative study explored the characteristics of basic psychological needs and motivation underpinning student

teachers' experiences of educational quality in higher education. The research question "How do student teachers' experiences of basic psychological need satisfaction and motivation reflect their perception of quality within their teacher education" was considered using a thematic analysis through the lens of SDT. We uncovered themes and subthemes that are in line with our pre-registered assumptions and theoretical framework. However, a number of interesting themes were also discovered that we had not expected. In general, the results showed that the factors influencing the students' basic psychological needs satisfaction were important experiences underlying educational quality and wellness in the teacher program. Furthermore, satisfaction of basic psychological needs was also important for the experience of autonomous motivation, which we found was essential for the students to remain in the program and for continued motivation to become a teacher.

4.1. Basic psychological needs

In general, the participants experienced a lack of both the need for autonomy and competence, which in general was experienced as negative, another general finding was that, to the extent that the students experienced relatedness satisfaction, this had a shielding effect for the students.

For autonomy, our analysis showed that the participants voiced few options for exercising autonomy around decisions regarding their education. The students in the current study expressed that they could "choose" to work less or receive a lower grade, which cannot be characterized as true choice but rather control. This finding suggests that the students' experiences of having an appropriate workload (dimension of educational quality) may be explained by the experience of the lack of autonomy satisfaction. A contrasting example was that when students felt that their instructor or program was flexible, they experienced greater autonomy satisfaction. This lack of autonomy satisfaction may be a concern given the many benefits of autonomy. For instance, in a study by Jang et al. (2016), the ability to choose the learning methods was predictive of needs satisfaction and conceptual learning.

For competence, our findings suggest that a lack of competence satisfaction was mainly impacted negatively by being overly challenged and a lacking sense of efficacy. Students reported that having demands and expectations that were too high led to low feelings of efficacy, which led them to give up, or to lower feelings of wellness. This is not surprising as external controls and pressures are likely to provide less information and guidance to the students, thereby making less progress in their sense of mastery (Ryan & Deci, 2017). In contrast, a mechanism that supported competence satisfaction was structure. When students were given structure, accompanied by guidance and clear descriptions and information, the students reported a stronger sense of competence. This finding was recently supported through a meta-analysis (Patall et al., 2023).

For relatedness, when the participants reported satisfaction of their needs in this area, this was experienced as a positive. Our analysis seems to indicate that relatedness has a shielding effect against adverse effects such as low motivation, low wellness, or dropout intentions. Students stated that the ability to connect, collaborate, and feel cared for by others was important for persisting in the program, and functioning well despite adverse situations during the program. This has been shown in previous studies which have found that low social integration among student teachers is related to dropout intentions (Bohndick, 2020), which also speaks to the inherent need to belong to a group for healthy functioning (Allen et al., 2021). Resolving structural issues such as high workload, low coherence within the program, or a poorly organized practicum is nevertheless important. A previous evaluation of the teacher education program in Norway has pointed out that conflict between activities at university and the mandatory practicum creates a sense of having a high workload, and feelings of stress and dissatisfaction among the students (NOKUT, 2022). Facilitating relatedness is an

important investment in order to build group cohesiveness, well-internalized forms of motivation regulations, and academic achievement (Escandell & Chu, 2021; Weinstein & DeHaan, 2014). Further, our findings suggested that relatedness frustration, manifested as loneliness, seemed to be negative for the participants. The feeling of loneliness was also driven by the students' experiencing in a fragmented study program. The feeling of group unity is important and may be achieved through well-organized programs, networks, and groups (Pavlovic & Jeno, 2024; Leo et al., 2023).

4.2. Motivation

Our findings suggest that the interaction between the needs for autonomy and competence was important for the experience of autonomous motivation to be a student teacher or remaining on their program. Underlying autonomous motivation was the inherent enjoyment or interest in the subject or teaching profession, or feelings of mastery and efficacy. Feelings of enjoyment, interest, mastery and efficacy, are the experiential characteristics of autonomous and intrinsic motivation (Deci, 1992). Students reported that when feeling basic needs satisfaction, they experienced intrinsic and autonomous motivation. Autonomous motivation was also higher when the students perceived their education as being more relevant, which is a sign of educational quality, such as when they had their practicum. In contrast, the students who experienced controlled motivation felt that their motivation was characterized by pressure, feelings of compliance, and self-control. For some, this resulted in uncertainty as to whether they even wanted to continue as a teacher after finishing their education. This is concerning given that this may have personal costs for the individual student and societal costs in terms of the loss of future members of the workforce (Bakken, 2022; OECD, 2019) and recruitment of future teachers (Eurydice, 2018).

4.3. Structural factors

Another major result was the high perceived workload. This was particularly evident difference between students in their first and fourth years. This experience was mainly driven by the frustration of the psychological need for competence, apparent from demanding expectations, high pressure, and workloads. Students in their fourth year, unlike those in first year, have practicum on top of regular courses (Elstad et al., 2023), which may explain the differences between the study years. The experience of feeling overly challenged or that activities were getting too difficult were manifestations of the frustration of the need for competence. This is in line with SDT arguments, which posit that it is important to experience an optimal amount of challenge in order to feel competence, as challenges that are too easy or too hard lead to feelings of incompetence (Ryan & Deci, 2017). The feeling of being overly challenged was also linked to how the students perceived the connection between the topics. Specifically, when there was poor organization, as with the conflict between exams and practicum, the students had a perception that there was more work for them to manage and felt less able and competent in terms of their achievement. Although the perception among the student teachers was that they had a high workload, studies suggest that student teachers in general do not necessarily work more than other students (Elstad et al., 2023). However, what may contribute to this perception is the structure of the teacher education program, which does not foster competence satisfaction. That is, experiencing a lack of integration between the different subjects and practicum may lead to perceptions of a high workload, which does not lead to a sense of competence or learning. The student teachers felt that they are "spread out", having practicum in remote areas which means long travel distances. They put a lot of effort into planning and executing teaching in their practical placement, but they do not get credits for this work which is mandatory.

5. Limitations and future directions

There are several considerations when interpreting our results. First, our data analysis is based on a deductive approach and theoretical constructs proposed by SDT research, in and outside of education. This precludes us from drawing interpretations from other theoretical approaches or purely analyzing themes and subthemes based on the data. It could be interesting to include other theoretical perspectives such as self-efficacy (Watt et al., 2017) to understand how student teachers' sense of self-efficacy could impact students' experience of demanding schedules, workload, and different forms of program conflicts. Students with a perceived belief in their capabilities learn or perform actions (i.e., self-efficacy) (Schunk & Pajares, 2009) may be able to better handle challenges and setbacks in the teacher program. Future studies are recommended to triangulate theoretical perspectives. In a similar vein, analyzing our data from an inductive approach may have allowed for other interesting findings. For instance, some of our findings point to the debate on theory-practice in teacher education (Korthagen, 2010; Ulvik, Riese, & Roness, 2018), which may relate specifically to the dimension of relevance in educational quality. Future inductive analyses may discover relevant themes and subthemes pertaining to this debate.

Second, although we based our sample size on code saturation (Hennink & Kaiser, 2022), a larger sample size may be warranted in future studies that seek to understand more diverse experiences. In the current study, we drew our sample size exclusively from students in their first and fourth years of the teacher program. Our decision on sample size was made due to known differences in experiences and differences in dropout rates and course structure. We nevertheless recommend that future research include students from the entire program to further understand the underlying mechanisms of basic psychological needs satisfaction, motivation, and educational quality. This would ensure "maximum variation" to uncover dynamics of motivational processes that might impact education quality. Furthermore, a larger sample size could also allow us to generalize the findings to other teacher programs or even other programs, contexts, and educational systems in general.

Third, our analysis was based solely on thematic analysis. Triangulation of analytical approaches could have uncovered interesting nuances not captured by the present analysis. For instance, case studies and document analyses could have been interesting to further understand educational quality, highlighting specifically how educational quality is conceptualized in educational and policy documents, and how this is manifested at the classroom, program, and university level (Hatch, 2002; Yin, 2009). Furthermore, following the participants over a period of time, either through video or observation, could have been an interesting approach to further understand the experiences that both satisfy and frustrate students' psychological needs with regard to educational quality.

Finally, our study operationalization of educational quality is based on the legal definition in Norwegian higher education contexts. This may also preclude us from generalizing the specific results from our study to other contexts and higher education systems in other countries. Given the variability of the concept of quality (e.g., Tam, 2001), our approach has been to understand both the process and outcome aspects of educational quality from the perspective of Self-Determination Theory. This could be potentially useful given that some dimensions of quality may vary across subjects and fields of study (Gibbs, 2010). By using SDT, we understand quality from a student-centered perspective using the psychological needs for autonomy, competence, and relatedness as organizing constructs (Ryan & Vansteenkiste, 2023). This allows us to understand when and why students experience an instance or situation as conducive to quality. Future studies could broaden the concept of educational quality to encompass country-specific definitions, but also other theoretical operationalizations of educational quality.

6. Conclusion

The present study was conducted in order to understand student teachers' experiences of educational quality. The study was pre-registered, an unusual step in the nascent qualitative SDT literature and in teacher education literature in general. We believe pre-registration fits well with the ontological assumptions of SDT (Ryan & Niemiec, 2009), and does not preclude the iterative analytical process that is an inherent strength to qualitative methodology. The results of our study show that structural differences in educational programs affect the experiential quality of the students. The deductive approach from an SDT perspective also uncovered a number of interesting nuances as to how programs can be designed or modified to better support students' needs for autonomy, competence, and relatedness. This was evident in our analysis in terms of how the program was designed, as it impacted students' workload and feelings of wellness. For instance, creating a space for students to experience a sense of integration and wholeness within their teacher programs seems to be important for increasing their sense of relatedness and reducing feelings of negative affectivity and stress. This could be achieved through several means. For instance, creating separate modules within each course dedicated to student teachers might enable the students to understand the relevance of the different courses and subjects for their specific teacher program. Furthermore, a reorganization of the teacher program and proper alignment of the different courses (e.g., didactics, pedagogy, discipline-specific subjects, practicum) would result in less conflict between practicum, courses and exams, as reported by the students, which would add to the sense of integration.

CRediT authorship contribution statement

Lucas M. Jeno: Writing – original draft, Methodology, Funding acquisition, Formal analysis, Conceptualization. **Chantal Levesque-Bristol:** Writing – review & editing, Supervision, Methodology. **Jorun Nylehn:** Writing – review & editing, Supervision, Methodology. **Zeljana Pavlovic:** Writing – review & editing, Methodology, Formal analysis. **Dag Roness:** Writing – review & editing, Supervision, Methodology. **Netta Weinstein:** Writing – review & editing, Supervision, Methodology.

Declaration of competing interest

The authors declare no conflicts of interest.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.ssaho.2025.101354.

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