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**RELATIONS BETWEEN STUDENT TEACHERS' BASIC NEEDS
FULFILLMENT, STUDY MOTIVATION, AND ABILITY BELIEFS**

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Abstract

Based on the theoretical perspective of Self-Determination Theory, this study examined how of basic need fulfillment (relatedness/competence/autonomy) on student teachers' academic motivation and ability beliefs during teacher education studies are related. Data were collected from 107 student teachers who completed questionnaires to evaluate their basic need fulfillment, as well as academic motivation and ability beliefs while studying in teacher education program. The data analysis indicated, that for university students, fulfillment of some needs in support of academic motivation, may be more important than others. Namely, fulfillment of student teachers' competence and autonomy needs were associated with intrinsic academic motivation more strongly whereas relatedness was associated only weakly. Neither gender, study form (part-time or full- time) nor "working as a teacher" aspect played a role in respondents' satisfaction of psychological basic needs, on their ratings of academic motivation or ability beliefs. From these findings, it can be concluded that fulfillment of psychological basic needs, especially needs for autonomy and competence positively support student teachers' intrinsic motivation. The fulfillment of autonomy and competence needs was also positively correlated with student teachers' incremental ability beliefs. If the study environment offers feelings of choice and agency, allows feedback which appreciates the effort and supports the feeling of effectiveness we will foster student teachers' healthy psychological development and academic motivation to study and thus increase opportunities that after graduating they will enter the teaching profession.

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1. Introduction

Many countries are forced to admit that teacher education has not been as popular a choice among young people as might be hoped. Estonia is not an exception, the numbers of students entering teacher training are diminishing and the loss of students from the teacher training programs increases.

At the same time, the teaching workforce in Estonia is growing older, and there is a lack of teachers in certain subject areas (Ülevaade Eesti õpetajaskonnast, 2008). As there is a lack of teachers, the question then becomes whether it is possible to better support student teachers during their studies so that they will be graduating and entering the profession.

The reasons, why some students of equivalent intelligence and aptitude achieve at university and others do not have been attributed in part to differences in academic motivation (Faye & Sharp, 2008). Recent research about academic motivation has been broadly guided by self-determination theory (SDT), a theory of human motivation that was developed by Deci and Ryan (e.g. Deci & Ryan, 1985, 2002) and has proven to be a valuable framework in predicting motivation in individuals. In the present study, we rely on a growing literature investigating these issues by examining academic motivation within the context of self-determination theory. Previous research has shown that the contextual supports in the academic environment affect perceptions of autonomy, competence, and relatedness, and such perceptions then lead to the experience of intrinsic motivation (Deci & Ryan, 1985, 2000).

There is a broad body of research conducted among school students i.e. children, research examining self-determination theory (SDT) however, at the university level or in teacher education context, is still rare. Thus our goal was to identify the level of fulfillment of the three basic psychological needs of student teachers in the university classrooms and examine their relations with study motivation and ability beliefs.

1.1. Self-Determination Theory and Basic Psychological Needs

Self-determination theory is developmental in the sense that particular goals, values, and behaviors come to be integrated and organized within the self (Ryan & Deci, 2016). Environmental factors can affect the integration and organization of the self through the working of three basic psychological needs: the need for autonomy, the need for competence and the need for relatedness (Ryan & Deci, 2016). Autonomy refers to feelings of choice and agency, the need to express the authentic self, and to experience the self as the source of action. Competence refers to feelings of effectiveness. Relatedness refers to the experience of healthy social connexion, satisfying social relationships and feeling of belonging to a group or community (Deci & Ryan, 2002).

According to Ryan and Deci (2016), fulfillment of basic psychological needs is essential to psychological health and growth, to intrinsic motivation, and to the experience of well-being, optimal functioning, and self-actualization. When basic psychological needs are fulfilled, there is adaptation, adjustment, growth and optimal experience such as flow (Csikszentmihalyi, 1990; Ryan & Deci, 2016).

There is not much research that has been conducted into the fulfillment of basic psychological needs in student teachers. Reeve, Bolt, and Cai (1999) studied student teachers in a one-to-one teaching situation and showed that when the level of autonomy is low, student teachers feel pressured; they lose their motivation and experience a decrease of positive emotions and contact with their students. They

become controlling and less socially engaged. The same tendency also appeared in the study conducted with experienced teachers. Thwarting of the need for autonomy correlated to an increase of control, a decrease of pleasure and motivation, and a decrease of autonomy support given to their students (Pelletier, Seguin-Levesque & Legault, 2002). Although the need for autonomy was fulfilled, the studied student teachers experienced positive emotions and were oriented towards the fulfillment of the need for autonomy in their students. Evelein, Korthagen, and Brekelmans (2008) demonstrated that the fulfillment of three basic needs in student teachers also has a significant impact on their teaching experiences. The quantitative results show that their psychological needs are to some extent thwarted during the time of their first teaching experiences. The images of the student teachers demonstrate that on the one hand the lack of fulfillment corresponds with the experiencing of teaching problems, and on the other hand the fulfillment of the needs corresponds with pleasure and the experiencing of success and flow.

Thus environments that foster the fulfillment of autonomy, competence, and relatedness needs produce self-determined behaviors or intrinsic motivation, whereas environments that thwart these needs result in not-self-determined behaviors or extrinsic motivation.

1.2. Academic motivation

It is well known, that academic motivation positively influences academic performance. SDT posits that academic behavior can be seen as intrinsically motivated, extrinsically motivated or amotivated. Intrinsically motivated behaviors are initiated for their own sake, that is, for pleasure and satisfaction derived from their performance. The activity is initiated without the involvement of external constraints. Contrary, extrinsically motivated behaviors are instrumental in nature and are performed as a means to an end (Fortier, Vallerand & Guay, 1995). Within SDT framework, four types of extrinsic motivation have been identified along with an autonomy continuum: external regulation, introjection, identification, and integration. As one moves from external regulation toward integration, behaviors become less contingent on external controls. Proponents of self-determination theory have also proposed three types of intrinsic motivation: intrinsic motivation to know, intrinsic motivation toward accomplishment, and intrinsic motivation toward stimulation. An additional type of motivation, amotivation, refers to a general lack of intention to act or engage in an activity or doing an activity with no sense of intending to do it (Deci & Ryan, 2002). According to theory, autonomous forms of motivation (e.g. intrinsic motivation) lead to positive outcomes, whereas less autonomous types (e.g. amotivation) bring about negative consequences. Research has revealed, that autonomous i.e. intrinsic academic motivation produce higher level creativity, lower levels of dropout behavior, more cognitive engagement and better conceptual learning (cited by Fortier et al, 1995)

Ryan and Deci (2016) argue that the satisfaction of all three basic psychological needs is needed in order to change from controlled to more autonomous regulations and for experiencing the most optimal kind of motivation. Satisfaction of the needs for competence and relatedness might be enough for individuals to pursue activities for various controlled reasons. Thus, the experience of a sense of choice and, hence, the satisfaction of the need for autonomy is a prerequisite for the development of an identified or integrated regulation.

Earlier studies have shown that better school performance is associated with intrinsic motivation (Grolnick, Gurland, Jacob, & Decourcey, 2002) and greater need satisfaction (Levesque, Stanek, Zuehlke, & Ryan, 2004). Preservice teachers with autonomous motivation tend to endorse mastery-oriented goals for teaching (Malmberg, 2006; Roth, Assor, Kanat-Maymon, & Kaplan, 2007), and thus they are more willing to tackle challenges to improve teaching competence. There is also research evidence that intrinsic motivation will decline during the transition years from the elementary school into the high school (Lepper, Corpus, & Iyengar, 2005) and increase again the college and university years.

1.3. Ability Beliefs

Beliefs about one's ability play a prominent role in different motivation theories. Students' implicit theories of human attributes are believed to guide their interpretations of the self and others and influence their goals (i.e., performance vs. learning goals) and achievement-related behaviors (Dweck & Leggett, 1988). Based on the work of Carol Dweck and her colleagues an individual's motivation towards achievement is shaped by their implicit theory of intelligence i.e. his or her fundamental underlying beliefs regarding whether or not intelligence or abilities can change (Dweck & Leggett, 1988). Ability beliefs refer to students' perceptions of their abilities as fixed traits that are beyond their control, or as something that can change and grow. When the ability is viewed as fixed, the effort may be seen as futile, and failure as due to a lack of ability. On the other hand, when the ability is perceived as changeable, effort is simply a means to increase ability, and failure may be considered a learning opportunity. Studies have shown that entity theorists of intelligence react helplessly in negative outcomes (Dweck, Chiu, & Hong, 1995). The literature also suggests that fixed views of teaching ability may be problematic for future motivation as a teacher. When teachers with innate beliefs experience difficulties in the classroom they may question their teaching abilities and their sense of teaching efficacy may decrease. They may determine that they are not suitable to teach and leave the profession or resign themselves to being "bad" teachers. Thus it is important that teacher educators, mentors, and administrators who are aware of these beliefs as well as their potential negative consequences, can foster beliefs that are more adaptive by encouraging teachers to see teaching more as a skill to be developed and that even if aspects are innate, polishing and training is still needed (Fives et al 2008). In contrast to entity theorists, incremental theorists focus more on behavioral factors (e.g., effort, problem-solving strategies) as causes of negative achievement outcomes, tend to act on these mediators (e.g., to try harder, develop better strategies) and to continue to work towards mastery of the task (Dweck, Chiu, & Hong, 1995).

According to Dweck and Leggett (1988), entity theorists are more likely to endorse performance/ego goals, whereas incremental theorists have been shown to endorse learning/task goals. Performance goals operate when individuals are concerned with gaining favorable judgments of their competence in relation to others; learning goals are salient when individuals are concerned with self-referenced mastery of tasks and increasing their competence. Entity theory and incremental theory learners are also hypothesized to learn for different motives: more intrinsically motivated in the incremental theory case and a tendency for more extrinsic motivation in the entity theory case (Dweck 2002). |

2. Problem Statement

One of the critical issues facing the educational system in Estonia is the problem, that the teaching workforce is growing older, there is a lack of teachers and at the same time a big number of students leave the university before they graduate the teacher education program. Thus it is important to analyse how student teachers basic motivational needs are fulfilled and find solutions to better support the student teachers during their studies so that they will graduate and enter the teaching profession.

3. Research Questions

Research Questions leading our study were: How student teachers assess their satisfaction of basic psychological needs—autonomy, competence, relatedness during teacher education studies? How are the basic needs fulfillment related to their motivation and ability beliefs? Are there the differences in levels of fulfillment of basic psychological needs, motivation and ability beliefs between gender and between student teachers who study in different study forms or work as teachers during the studies?

4. Purpose of the Study

In the present study we sought to examine the interrelationships among the basic psychological needs, intrinsic motivation, and ability beliefs. The basic assumption underlying this research is that fulfillment of the basic psychological needs enhances students' intrinsic motivation (Niemic, Ryan, & Deci, 2010). Based on the previous studies we also expected to have a positive correlation between students incremental ability beliefs and academic intrinsic motivation. We were also interested to see what are the prevailing ability beliefs among teacher students, because if entity theories about teaching ability are pervasive among preservice teachers, these beliefs may explain how individuals respond to professional preparation and failures in classroom settings in the future (Fives et al, 2008).

5. Research Methods

5.1. Participants

In the study, 107 student teachers from Tallinn University (93 females and 14 males) participated. The age of the students ranged from 19 to 60 years (the mean age was 32). Approximately half studied full time (N=50) and a half (N=57) part time. Of the respondents, 36% were already working as teachers. For students' achievement, their GPA (cumulative grade point average of studies) was collected, which ranged from 2.7 to 5 (with the mean 4.2).

The questionnaire was either administered electronically or via paper-and pencil. The participation in the study was voluntary.

5.2. Instrument and data analysis

To determine the level of fulfillment of the basic psychological needs, motivation and ability beliefs a Basic Psychological Needs Questionnaire, Academic Motivation Scale and adapted Nature of Ability Beliefs Questionnaire were used.

The Basic Psychological Needs Questionnaire (BPNQ) consisted of 16 items, measuring three scales: competence, relatedness, and autonomy. All three scales showed a good internal consistency (autonomy's Cronbach $\alpha = 0.76$, competence $\alpha = 0.83$, relatedness $\alpha = 0.83$).

Academic motivation. We used the college version of the Academic Motivation Scale (AMS; Vallerand et al., 1992) to assess three types of intrinsic motivation (to know, toward accomplishment, and to experience stimulation), three types of extrinsic motivation (identified, introjected, and external regulation), and amotivation. The scale consisted of 28 items, each reflecting a possible reason for attending university. All three scales showed a good internal consistency: intrinsic motivation 0.90, extrinsic motivation 0.79, and amotivation 0.87.

Ability beliefs. Adapted Nature of Ability Beliefs Questionnaire (based on the Sarrazin et al, 1996) was used. The innate beliefs subscale consists of 8 items and incremental beliefs subscale consists of 4 items. The internal consistency for two subscales was for innate beliefs subscale 0.78 and for incremental subscale 0.76.

All questionnaire items were Likert-type items from 1 (totally disagree) to 5 (totally agree).

The data analysis included descriptive statistics, Pearson's correlations and independent sample t-test using SPSS software.

6. Findings

In Table 1 the means, standard deviations, and correlations between the basic needs' subscales and academic motivation's subscales are presented.

Table 01. Means, Standard Deviations, and Correlations for Basic Needs and Academic Motivation Subscale

Subscale	M (SD)	Autonomy	Competence	Relatedness	Intrinsic motivation	Extrinsic motivation	Amotivation
Autonomy	3.79 (0.69)	-					
Competence	3.80 (0.53)	0.62**	-				
Relatedness	3.92 (0.71)	0.41**	0.42**	-			
Intrinsic motivation	3.61 (0.63)	0.47**	0.44**	0.28**	-		
Extrinsic motivation	3.68 (0.57)	0.22**	0.07	0.13	0.26**	-	
Amotivation	1.39 (0.63)	-0.52**	-0.23*	-0.32**	-0.47**	-0.36**	-

**Correlation is significant at the 0.01 level

* Correlation is significant at the 0.05 level

The analysis of the fulfillment of basic needs found out that the answers to the autonomy subscale ranged from 2.0 to 5.0 (mean 3.79), the competence scale from 2.5 to 5.0 (mean 3.80), and the relatedness

subscale from 1.83 to 5.0 (mean 3.92). Therefore, we may conclude that the level of fulfillment of teacher students' psychological basic needs was above average in the 5 point scale.

As expected, we found positive correlations between all three basic needs scales: autonomy, competence, and relatedness. Therefore, the higher fulfillment of autonomy goes hand in hand with the higher fulfillment of the competence and relatedness. When checking the statistical differences it appeared that neither gender, study form nor "working as a teacher"- aspect played a role in respondents' satisfaction of psychological basic needs.

The correlation analysis between basic needs and academic motivation revealed that the need for competence and autonomy had higher correlations with intrinsic motivation ($r=0.44$ and $r=0.47$, $p<0.01$ respectively) than relatedness ($r=0.28$, $p<0.01$). Thus, when aiming to increase the students' intrinsic motivation, the support of their autonomy and the development of positive beliefs about ones' competence could be considered. Amotivation was negatively correlated with all basic needs subscales as well as intrinsic ($r= -0.47$, $p<0.01$) and extrinsic motivation subscales ($r=0.36$, $p<0.01$). As previous research has shown, when study environments thwart basic psychological needs, the result is likely lower self-determination and either extrinsic or amotivational orientation (Ryan & Deci, 2016). There were no statistically significant differences between different groups (based on gender, study form) on their ratings to academic motivation. The relationship between student achievement (GPA) and different subscales (autonomy, competence, relatedness, intrinsic motivation, extrinsic motivation, amotivation) was checked. The only statistically significant relationship, nevertheless low, was found between achievement and competence ($r= 0.31$, $p<0.01$). It has been argued that the need for competence as a basic need is a major reason why people seek out optimal stimulation and challenging activities (Deci & Ryan, 1985).

The third subscale used in the study represented beliefs about ones' abilities that were classified either as innate or incremental beliefs about ability. The means, minimum and maximum values, and standard deviations of ability beliefs subscales are presented in Table 2.

Table 02. Means, Standard Deviations for Ability beliefs subscale

Subscale	Minimum	Maximum	Mean	Sdt.Deviation
Innate beliefs	1.14	4.13	2.53	0.54
Incremental beliefs	3	5	4.32	0.50

One might assume that incremental beliefs are related to intrinsic motivation and innate beliefs are more probably connected to extrinsic or amotivation. As expected, incremental beliefs correlated positively to intrinsic motivation ($r= 0.33$, $p<0.01$). Therefore, the more one believes that abilities are not fixed but developable the higher intrinsic motivation. Moreover, significant relationships among incremental beliefs and competency ($r= 0.48$, $p<0.01$) and autonomy ($r= 0.45$, $p<0.01$) appeared. Thus it may be expected that study environments that offer feelings of choice and agency, allow feedback which appreciates the effort and supports the feeling of effectiveness will foster teacher students' incremental beliefs. In addition, a low correlation between amotivation and incremental beliefs appeared ($r= 0.24$, $p<0.05$), which is expected since if you do not believe that the effort is beneficial, then motivation will likely be low. All three basic needs subscales were statistically significant, but weakly, negatively related

to innate beliefs (correlation between innate beliefs and autonomy $r = -0.25$, competency $r = -0.24$, and relatedness $r = -0.25$, $p < 0.05$). Also in beliefs about ability no gender, study form nor “working/not working as a teacher” differences were found between different groups. |

7. Conclusion

In the present study, we sought to examine the relationships amongst basic psychological needs, academic motivation and ability beliefs in university students. By getting better insight into the importance of particular psychological needs of student teachers, we can better understand how to foster feelings of intrinsic motivation in the classroom. Based on the analysis we may say that student teachers assess their satisfaction of basic psychological needs, i.e. autonomy, competence, and relatedness during the teacher education studies as above average. There were no statistical differences between the evaluations of the fulfillment of different basic needs.

The previous research results with school children (in the grades 6 and 7) revealed that the fulfillment of the need for competence and the need for relatedness were the most important in predicting students’ learning enjoyment, while the fulfillment of the need for autonomy proved to be of less significance (Hagenauer & Hascher, 2010). In the present study with university students competence and autonomy needs were associated with intrinsic academic motivation. However, relatedness was associated only weakly. Thus the present study suggests, that for adults ie university students, some needs may be more important than others. (see Fig.1)

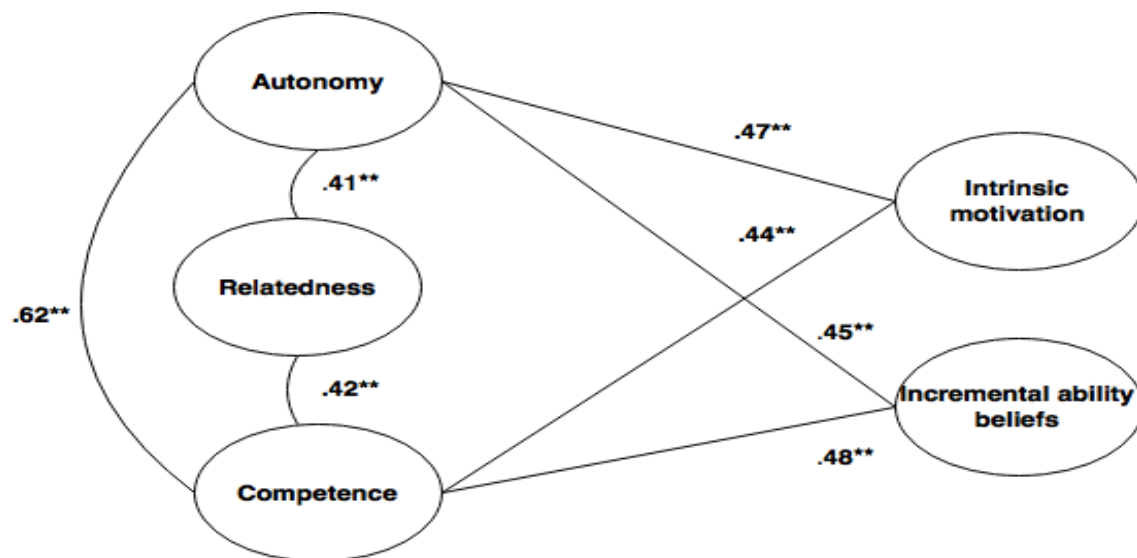


Figure 01. The correlations ($p < 0.01$) between of the three basic needs dimensions intrinsic motivation and incremental ability beliefs.

Shahar et al (2003) also found in their study with an adolescent, that relatedness was not associated with academic motivation. Deci and Ryan (2000) have noted that there may be “situations in which relatedness is less central to intrinsic motivation than autonomy and competence” (p. 235). Further research clarifying the precise role of relatedness in the experience of intrinsic motivation across domains

would be needed to broaden our understanding of how, when, or if social connections come to affect motivational orientation.

As need fulfillment occurs largely in interaction with the environment and depends on the supportive or non-supportive environmental conditions at a given moment and situation (Deci & Ryan, 2000), the resources aimed at improving the university academic environment to be more autonomy and competence supportive would be resources well spent.

By fostering competence and autonomy in the university classroom, educators may not only foster intrinsic motivation but also promote the establishment of a strong and positive sense of self (Faye & Sharp, 2008). When individuals are intrinsically motivated, they are in control of their own actions (autonomous), believe they can accomplish things (competence) and are connected to others (relatedness). Being intrinsically motivated relates strongly to well-being, and so is an important developmental outcome (Ryan & Deci, 2016).

Fulfillment of basic needs was negatively correlated to amotivation. Interestingly students' average grades did not correlate with the ability' beliefs, nor academic motivation. There were neither gender nor study-form (full-time versus part-time) differences detected.

We found positive correlations between students' incremental beliefs and intrinsic motivation. These findings are similar to research results of Moreno-Murcia et al. (2010) who demonstrated that the improvement of beliefs in students' own abilities was associated with increases in intrinsic motivation. Moreover, a significant relationship between incremental beliefs and competency and autonomy appeared.

It is thought that teachers' beliefs will develop through the synergy of student teachers' personal learning experiences and teaching methods used in teacher education courses (Brownlee, Schraw, & Berthelsen, 2011) therefore the environmental factors such as fulfillment of psychological basic needs during the study process is essential.

The present study suggests that in the academic domain, an environment that allows students to make their own choices, set personal goals, express their opinions, and be an integral part of classroom decisions is one that will foster both healthy psychological development and academic intrinsic motivation. Intrinsic motivation is enhanced as well as the development of incremental beliefs supported in those environments. These environments are those in which students feel challenged, yet have the opportunity to accomplish goals as the environment allows feedback which appreciates the effort and supports the feeling of effectiveness. Achieving this balance may be one of the most difficult tasks for educators faced with classrooms that are becoming increasingly diverse academically.

Future research on self-determination in teacher education could be of added value to the pedagogy and development of teacher education curricula if more longitudinal studies are conducted to see changes in need satisfaction and motivation over studies, more intervention and experimental studies are conducted including a broad spectrum of possible need supportive practices, and possible influencing contextual factors are taken into account. The findings from research focusing on the implemented practices and their influence on the students' need fulfillment will contribute to the formulation of evidence-based and practical recommendations on how to enhance prospective teachers motivation in the context of teacher education.]

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