

Changes in the Academic Motivation and Satisfaction with Studies of Pre-Service Physical Education Teachers during the Study Period*

Cambios en la motivación académica y satisfacción con los estudios de los profesores de educación física en formación durante el periodo de estudio

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ABSTRACT

The study describes and explores how the academic motivation and satisfaction of pre-service physical education (PE) teachers change during the study period and how autonomous and controlled academic motivation is related to student satisfaction with academic studies. For data collection, questionnaire surveys were used. The Academic Motivation Scale (AMS) and The Course Experience Questionnaire (CEQ) were applied. Repeated cross-sectional studies design at regular intervals was also used in this research. Data were collected four times during PE students' study period in four Lithuanian universities. The samples were distributed according to the study year: first-year $n = 84$, second-year $n = 72$, third-year $n = 59$, fourth-year $n = 44$ students. The analysis of the data showed that students' academic motivation and satisfaction with studies changed during the study period. Both autonomous and controlled academic motivation indicators have relationships of similar strength with the same subscales of satisfaction with studies. The research results obtained provide a better understanding of the change in students' academic motivation regarding students' perceptions of the academic environment revealed through student study satisfaction.

Keywords

physical education; teaching; profession; self-determined motivation; pre-service teachers; satisfaction; educación física; enseñanza; profesión; motivación autodeterminada; profesores en formación; satisfacción.

RESUMEN

El estudio describe y explora cómo cambia la motivación académica y la satisfacción de los docentes de educación física (EF) en formación

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durante el periodo de estudio, y cómo la motivación académica autónoma y controlada se relaciona con la satisfacción del estudiante con los estudios académicos. La recolección de datos se realizó mediante cuestionarios. Se aplicaron la escala de motivación académica (EMA) y el cuestionario de experiencia del curso (CEC). En esta investigación se utilizó el diseño repetido de estudios transversales a intervalos regulares. Los datos se recopilieron cuatro veces durante el periodo de estudio de los estudiantes de educación física en cuatro universidades lituanas. Las muestras se distribuyeron según el año de estudio de la siguiente manera: primer año $n = 84$, segundo año $n = 72$, tercer año $n = 59$, cuarto año $n = 44$ estudiantes. El análisis de los datos mostró que la motivación académica y la satisfacción de los estudiantes con los estudios cambian durante el periodo de estudio. Los indicadores de motivación académica autónoma y controlada tienen relaciones de fuerza similar con las mismas subescalas de satisfacción con los estudios. Los resultados de investigación obtenidos proporcionan una mejor comprensión del cambio en la motivación académica de los estudiantes en relación con sus percepciones sobre el entorno académico revelado a través de su satisfacción con el estudio.

It is widely acknowledged that the professional teachers' careers involve several stages, and preparation for this professional development begins in university (Mäkelä & Whipp, 2015; Woods & Lynn, 2014). The choice of profession is a complex process determined by various social, cultural, and psychological factors (Richardson & Watt, 2016; Spittle et al., 2009). The essential motives for career satisfaction and extended survival in the chosen profession are both internal and altruistic (Kyriacou & Coulthrd, 2000). Rots & Aelterman (2009) have defined that higher intrinsic motivation of the students or matriculates to pedagogical study programmes is related to their involvement in the study process and inclination to work as teachers and the continuity of their career.

A study by some researchers (Lyons et al., 2010; Nauta, 2007) shows that satisfaction with one's professional choice is associated with a higher probability of not dropping out of studies and preparing to work in the chosen specialty. After choosing a study programme and starting their studies, students should become more and more motivated for their chosen

profession. However, due to various internal and external factors, motivation can develop in both directions – it can become stronger or weaker. Thus, even during their studies, it is already possible to be satisfied or dissatisfied with their professional choice because, based on their experience, students can identify the potential benefits of the profession, express complacency with opportunities to achieve professional career goals, and assess general satisfaction or frustration with professional choices made (Cunningham et al., 2005). There is evidence that during the study period, students' professional expectations, satisfaction with the chosen profession, and intentions to pursue a professional path decrease (Urbanavičiūtė, 2009), and students also express lower academic motivation (Brouse et al., 2010; Hakan & Münire, 2014).

Researchers usually apply the term “academic motivation” (AcM) to the study of motivation in the context of education (Blašková et al., 2019; Deci & Ryan, 1985; Vallerand et al., 1992; Wilkesmann et al., 2012). Such AcM can be defined as the factors that influence a person to attend an educational institution/school and obtain a degree (Hakan & Münire, 2014). According to Wilkesmann et al. (2012), AcM is perceived as a motivation to learn and in a broader context when analyzing the reasons and factors why a person decides to study or discontinues studies.

The authors that analyze the professional teachers' careers (Mäkelä & Whipp, 2015; Woods & Lynn, 2014) state that personal and organizational environment factors influence their career. This means that the academic environment as a factor of the organizational environment can enhance or reduce students' self-determination in their chosen profession. Different learning experiences and satisfaction or dissatisfaction with their studies can encourage students to become more committed to the profession or review their career goals (Pociūtė et al., 2012). Satisfaction is essential for successful learning (Sinclair, 2014). Therefore, specific surveys on student satisfaction can help uncover key components of the academic environment

that increase or inhibit one's determination to become a teacher. Such surveys may also assist in choosing strategies to improve the quality of teachers' education, seeking to meet students' expectations, and strengthening their self-determined motivation in making their choice to become a teacher.

Although lately research on teachers' motivation to teach and continue their professional careers has been getting renewed more often than ever before (Han & Yin, 2016), the motivation of physical education (PE) teachers to pursue a professional career has not been extensively studied. Some previous studies have focused on the reasons why individuals choose a career as a PE teacher (Cancela & Pérez, 2010; Ralph & MacPhail, 2015; Spittle et al., 2009), focusing more on the processes of socialization rather than motivation. Other researchers highlighted facilitators and attractors of pre-service PE teachers (Spittle et al., 2009; Spittle & Spittle, 2014), perceptions, and beliefs related to the subject and profession when they enroll (Ferry, 2018; Spittle & Spittle, 2016).

Spittle and Spittle (2014) revealed that certain factors successfully predicted various forms pre-service teachers' motivation. In their work for modeling study programmes, PE programme administrators need to understand the factors influencing students' career choices (Ralph & MacPhail, 2015). The factors why students choose specific fields of study can predict their ability to adapt to higher education as well as their future development of the chosen career (Yu et al., 2018). However, their level of early motivation cannot ensure that motivation would be maintained throughout teachers' professional careers. The AcM of pre-service PE teachers fluctuates throughout different study periods (Spittle et al., 2009). McCullick et al. (2012) and Woods et al. (2016) observe the changing needs of students admitted to PE teacher education programmes. According to Vallerand et al. (2008), the change in motivation is influenced by situational and contextual factors. The internalization of motivation occurs only due to multiple successful interactions with the environment. As a result, not only it is

important for the higher education institution to attract students to become PE teachers, but also to maintain their motivation for the chosen profession through the teaching process. Therefore, to understand the change in AcM during the study period, it is important to analyze how students perceive interaction with the academic environment, that is, to research the level of students' satisfaction with their studies.

The significance of satisfaction with activities that students are engaged in is empirically based on research on various phenomena and is usually associated with the emotional aspect. Lent et al. (2007) established that satisfaction with studies (SS), also known as academic satisfaction, includes a person's confidence in carrying out tasks independently, his or her expectations about results, progress made towards achieving one's goals, as well as the perceived academic and social support. Satisfaction with the study programme is related to the need for achievement, while achievement is related to the intention to pursue a career in the field of study (Lyons et al., 2010). Some authors tend to consider satisfaction with studies as one of the indicators of academic success (Lounsbury et al., 2009).

Students' SS is not widely analyzed by researchers. Their exploration of this subject is focused more on the working teachers' job satisfaction. Students' satisfaction has been researched by Bobrova et al. (2010), Pociūtė et al. (2012), Sinclair (2014), Poteliūnienė (2018), Tucker et al. (2008), Wach et al. (2016), Wiers-Jenssen et al. (2002). However, students' AcM and their satisfaction with chosen studies, as a factor of that motivation and academic success, still lack the attention of researchers. In addition, only the current situation of a particular study period is usually observed while lacking any longitudinal research. Although some research (Pociūtė et al., 2012) shows that students' satisfaction does not significantly change when comparing the first and fourth years of studies, this requires further investigation, as the field of study itself may influence it. Wilkesmann et al. (2012) established that field of

study and professional orientation affect intrinsic and extrinsic motivation differently. Moreover, research findings (Bedel, 2016; Brouse et al., 2010; Hakan & Münire, 2014; Sivrikaya, 2019; Vecchione et al., 2014) on the effect of gender as a factor affecting AcM are also conflicting.

Self-determination Theory (SDT)

The theoretical basis for this study is the Self-determination theory (SDT), derived from the works of Deci & Ryan (1985) and further developed by Vallerand et al. (1992). SDT is applied in researching various fields of study, including the educational field (Deci & Ryan, 1985; Deci et al., 1991). SDT perceives motivation as an incentive, impulse, or energy that drives you to act (Ryan & Deci, 2000), so AcM can be viewed as an incentive or impulse to learn or perform other activities related to the academic environment. More specifically, AcM in the context of studies would include all the reasons, impulses, and incentives for a person to study in university (Kairys et al., 2017).

SDT argues that human behavior can be intrinsically motivated, extrinsically motivated, or amotivated, and the quality of individuals' motivation affects the extent to which these individuals will engage in, and persist with, behaviors (Deci & Ryan, 1985; 2000). In addition, SDT distinguishes between autonomous and controlled forms of motivation that reflect an individual's rationale or reasoning for engaging in specific activities and that are determined by the perception of whether the behavior would meet a person's psychological needs. Autonomous motivation is defined as engaging in certain behavior by realizing that it is consistent with intrinsic goals or outcomes and arises from the person himself, meaning that the person is the one making the decision. Thus, students characterized by such behavior feel able to make choices; they experience acceptance, interest, and satisfaction and are, therefore, likely to continue doing so. Students acting for autonomous reasons are more likely to initiate and continue behavior without external

reinforcement and contingency. Therefore, autonomously motivated individuals tend to be more effective in self-regulating behavior. With autonomous self-regulation, which shows greater personal self-determination, students' academic achievements improve (Feri et al., 2016; Kairys et al., 2017). In addition, they are more persistent in pursuing set goals and tend to engage in more complex tasks (Boiché et al., 2008).

Conversely, controlled motivation reflects students' behavior that is not autonomous but instead arises from extrinsic reasons, such as seeking reward and perceived approval from others or avoiding the feeling of punishment or guilt. Students engaged in certain behavior for controlled reasons feel a sense of duty and pressure and are more inclined to continue the behavior as long as the external contingency is present. If this external reinforcing factor is removed, students' actions will likely desist. Therefore, the control-motivated individuals are less likely to be self-regulated; in other words, such students are less prone to behavioral self-regulation. Control-motivated behavior is not considered supportive of one's psychological needs; instead, it is recognized more as an obstacle to meeting them.

SDT argues that as a person's self-determination increases, the expression of motivation can constantly change according to three leading positions, reflecting the level of autonomy on which a person's behavior is based: amotivation, extrinsic motivation (EM) and intrinsic motivation (IM). IM, distinguished by three types (*IM to know*, *IM toward accomplishment*, *IM to experience stimulation*) (Deci & Ryan, 1985; Vallerand et al., 1992), is a form of motivation that shows greater self-determination. Thus, students with IM act in their own interests while studying, feeling pleasure and satisfaction from the activities performed. However, EM is related to a person's behavior, their activities that are initiated by external factors instead of internal ones. The types of EM distinguished by the STD differ in a person's level of self-determination (from the lowest to the highest level of self-determination): *external regulation*, *introjected regulation*, *identified*

regulation, and integrated regulation. External regulation shows student behavior that is not autonomous; rather, it is regulated by external factors such as rewards, pressure, or constraints. Introjected regulation means that student behavior is partially internalized, but it is heavily controlled by internal pressures due to various external obligations and remains regulated by reward or restraint. In such cases, the student's feelings of worth are often dependent on doing as he or she should. Identified regulation occurs when students perceive higher education's value and behave or act in a certain way because they feel it is important. Therefore, in this case, student behavior is more internalized and indicates a greater determination to pursue a professional career. Integrated regulation is very similar to identified motivation and, when conducting factor analyzes, it falls into the same factor as the identified one (Vallerand et al., 1992). As a result, we will not analyze integrated regulation in our study.

Thus, IM and well-internalized types of EM (identified or integrated motivation) are classified as autonomous, and poorly internalized types of EM are classified as controlled motivation (Deci & Ryan, 2008; Vansteenkiste et al., 2006). SDT also distinguishes amotivation, which is associated with a person's helplessness when they lack the intention to act or have a relative lack of autonomous and controlled regulation. Both autonomous and controlled motivation stimulate people to act and direct their behavior, making them both different from amotivation, which essentially means a lack of intention and motivation (Deci & Ryan, 2008).

SDT emphasizes the effect of social factors on different types of motivation, and the influence of these social factors is exerted through the satisfaction of certain psychological needs (Vallerand, 1997). The social context and the relationship between teachers and students in the educational process significantly contribute to transforming autonomous motivation into controlled motivation, or vice versa. It all depends on the extent to which teachers support student autonomy and how a person's basic psychological needs (autonomy, competence,

and relationship) can be met (Ryan & Deci, 2000). Thus, the autonomous motivation of PE students and the academic environment that supports their autonomy are important factors in developing students' academic achievements. In order to better understand the change in AcM during the study period, it is necessary to analyze students' perceptions of the academic environment. In addition, understanding and applying these factors can help mobilize the individual efforts of all members of the university community to develop and strengthen their AcM consciously.

The purpose of this study was to determine how the academic motivation and satisfaction of pre-service PE teachers studying in Lithuanian higher education institutions change during the study period and how autonomous and controlled academic motivation is related to student satisfaction with their studies.

Method

Repeated cross-sectional studies design at regular intervals were used in this research. Data collection was conducted on the same target population at different time points. Repeated cross-sectional data were collected four times during PE students' study period at university (2015 – 1st year of study, 2016 – 2nd year of study, 2017 – 3rd year of study, 2018 – 4th year of study). For an annual survey, this means that respondents in one year will be different people to those in a prior year. In our case, both the same and new students could be included in the survey sample each year. Research data were analysed cross-sectionally combined for analysis over time.

Participants

Stratified random sampling was used for the study. This method of sampling was determined by the purpose of the study. The sample was stratified on two characteristics: university and gender identity. A random sample from each stratum in every year of study was taken in a number proportional to the stratum's

size compared to the population. The general set of the research consisted of full-time students of PE programs implemented in 4 Lithuanian universities. Full-time students are chosen because this form of study, compared to the form of part-time studies, due to its specifics, gives students greater opportunities to learn about the academic environment, which can affect the results of research. In addition, the duration of these forms of study varies. The duration of full-time studies in Lithuania to obtain a bachelor's degree, which gives the right to work as a PE teacher in a general education school, is four years. According to the data provided by higher education administrations in 2015, 165 first-year students were studying full-time to obtain a bachelor's degree in educational sciences, a qualification of a PE teacher. 141 students continued their studies in 2016, and 126 students in 2017, while in 2018, of all the researched students who enrolled in the universities in 2015, only 112 continued for the fourth year of their study programme. Thus, during the research period of 2015–2018, 644 questionnaires could be collected in total while conducting research each year. In order to draw conclusions for the entire studied population, when using the 95th percentile, 241 questionnaires had to be collected; 259 questionnaires were actually collected, while nine were rejected due to the lack of data. The samples of informants during each year of study are presented in Table 1. It was distributed according to the study year: first-year $n = 84$ students, second-year $n = 72$ students, third-year $n = 59$ students, fourth-year $n = 44$ students. Men made up 61 percent of the studied sample, while 39 percent were women.

Table 1
The structure of the sample

Research stages	2015	2016	2017	2018
<i>Year of studies</i>	1st year	2nd year	3rd year	4th year
<i>Gender</i>				
Men	54	41	38	25
Women	30	31	21	19
Total	84	72	59	44

Instruments

Two Likert-type scales (Academic Motivation Scale; Course Experience Questionnaire) were used to collect data in the current study. The demographics form contained three questions that asked participants to indicate their gender, year of studies, university.

Academic Motivation Scale (AMS) (Vallerand et al., 1992). AMS was used to assess students' AcM. AMS consisted of 28 items dealing with the measurement of intrinsic (to know, toward accomplishment, to experience stimulation) and extrinsic (identified, introjected, external regulation) motivation and amotivation. 7-point Likert scale has been applied: 1 - does not correspond, 2-3 –corresponds a little, 4 –corresponds moderately, 5-6 –corresponds a lot, 7 –corresponds exactly. Participants are asked to indicate to what extent each question corresponds to the reason why they went to the university.

The validity and reliability of the AMS scale has been confirmed in several studies (Spittle & Spittle, 2014; Stover et al., 2012; Vallerand et al., 1992). It has been adapted in different countries, such as Croatia (Koludrović & Ercegovac, 2014), Italy (Alivernini & Lucidi, 2008), Greece (Barkoukis et al., 2008), Turkey (Can, 2015), Poland (Areńska et al., 2016) and elsewhere, as well as in Lithuania (Kairys et al., 2017). In the study by Kairys et al. (2017) Cronbach's alpha values for the subscales ranged from 0.74 to 0.92. The internal consistency of the AMS scale for this research sample was acceptable: 0.903 in 2015; 0.864 in 2016; 0.860

in 2017, 0.832 in 2018). Cronbach's alpha values for individual subscales of the questionnaire ranged from 0.675 to 0.864.

Intrinsic motivation (to know, toward accomplishment, to experience stimulation) and identified motivation are classified as autonomous and introjected, while external regulation motivation is classified as controlled motivation. Autonomous and controlled motivation indicators were obtained by summing the indicators of the respective AMS subscale statements and dividing them by the number of statements.

The Course Experience Questionnaire (CEQ) (McInnis et al., 2001; Ramsden, 1991). CEQ was used in order to determine the students' SS. Australian higher education institutions have approved this questionnaire as an indicator of study quality, but it is also used in the European context to study student satisfaction as a component of study quality (Byrne & Flood, 2003; Özgüngör, 2009; Stergiou & Airey, 2012). The CEQ consists of 24 items divided into five scales: *Quality of teaching* (6 items), *Clear goals and standards* (4 items), *Appropriate workload* (5 items), *Appropriate assessment* (4 items), *Autonomy* (5 items). Participants rated their agreement with items on a 5-point scale: 1 -strongly disagree (-100), 2 - disagree (-50), 3 - neither agree nor disagree (0), 4 - agree (+50), 5 - strongly agree (+100). The internal consistency of the scales of the Lithuanian version has been checked by Bobrova et al. (2010). Cronbach's alpha coefficient in individual subscales ranged from 0.546 to 0.702. For the current study, Cronbach's alpha coefficient of the CEQ was found as 0.756 in 2015, 0.680 in 2016, 0.808 in 2017, 0.777 in 2018.

Procedure

The Research Ethics Committee of the Lithuanian University of Educational Sciences approved the initial research and the further research of the questionnaire. The survey was conducted in the middle of the spring semester of each academic year (in March). It was carried

out during regular class hours with the prior consent of the head of the higher education institution and in agreement with the lecturers. Students were informed about the purpose of the research and that participation in the survey was optional and voluntary. Each year, the survey was conducted by the same lecturers of various higher education institutions. The first two authors of the article collected data at their universities, while lecturers from the other two universities were thoroughly instructed about the purpose and procedures of the research. The first author was available to answer questions associated with the questionnaire during its administration. The questionnaire was administrated with the main research present to give a general explanation of the study, fill in the instruments and answers any questions that may have arisen in the process. Approximately, students spent 20 to 25 minutes filling out the instruments. The filled-in questionnaires were sealed in envelopes.

Data analysis

Cronbach's alpha coefficient was used to estimate scales of internal consistency, as well as for the internal consistency of every AMS and CEQ subscale. Descriptive statistics (arithmetical means, standard deviations) of each variable were computed and have compared data based on gender. Independent samples t-tests were used to determine any significant differences in AcM and SS for gender. One-way analyses of variance (ANOVAs) were used to determine any significant differences students' AcM and in SS for the year level. Where significant differences were found, post hoc tests were employed to investigate the nature of those differences further. Bonferroni criterion was applied when the variable dispersion in groups was equal, and Tamhane's criterion was applied when variable dispersion in groups was unequal.

The Pearson correlation coefficient r was calculated to determine the relationship between two quantitative variables. This measuring tool quantified the strength and the direction of the relationship between the students' autonomous

motivational regulation, controlled motivational regulation, amotivation, and their satisfaction with studies. The intention was to discover which satisfaction of studies variables were most highly associated with the different types of motivation. The statistical analysis of research data was conducted using SPSS 22.0 software.

Results

Academic motivation

The research revealed that intrinsic and extrinsic AcM tend to change during the study period. Table 2 shows that the highest indicators of students' IM in all subscales were observed in the second academic year. After analyzing the results in different years of study, statistically, significant differences were observed in subscales *IM to know* ($p = 0.008$), *IM toward accomplishment* ($p = 0.004$). These subscales revealed statistically significant differences when comparing the indicators of the 1st year to the 4th year: *IM toward accomplishment* ($p = 0.022$), also when comparing the indicators of the 2nd year to the 4th year: *IM to know* ($p = 0.036$), *IM toward accomplishment* ($p = 0.005$). The decreasing trend of *IM to know* is also shown by the difference between the 1st and 4th year ($p = 0.054$). Thus, it can be stated that the IM of the 4th year students decreased during the study period.

Table 2

Descriptive statistics (Mean -M, Standard Deviation -SD) and F test statistics for academic motivation by current year level and t test statistics by gender

Variable	M	1st year			2nd year			3rd year			4th year			F	p
		Men	Fem	Total	Men	Fem	Total	Men	Fem	Total	Men	Fem	Total		
IM to know	5.41	5.57	5.47	5.35	5.76	5.51	4.93	5.46	5.08	4.76	5.22	4.96	4	0.008	
	SD	0.97	1.07	1.00	0.89	1.02	0.97	1.16	1.27	1.21	1.06	1.19		1.13	
IM toward accomplishment	4.95	5.03	4.98	4.96	5.28	5.10	4.53	4.89	4.68	4.28	4.50	4.38	4.6	0.004	
	SD	1.08	1.43	1.21	0.84	1.02	0.93	1.26	1.05	1.19	1.04	1.35		1.18	
IM to experience stimulation	4.29	4.35	4.31	4.42	4.66	4.53	4.18	4.44	4.20	4.18	4.33	4.24	0.79	0.502	
	SD	1.44	1.44	1.43	1.07	1.32	1.19	1.23	1.39	1.32	1.31	1.50		1.39	
EM identified	5.65	5.79	5.70	5.43	5.79	5.58	4.97	5.26	5.04	4.17	5.05	4.55*	13.53	0.001	
	SD	0.96	1.11	1.01	0.90	0.80	0.87	1.12	1.39	1.21	1.36	1.18		1.34	
EM introjected	5.04	5.40	5.17	5.13	5.51	5.29	4.96	5.39	5.14	4.25	4.75	4.47	4.08	0.007	
	SD	1.32	1.31	1.32	1.25	1.27	1.27	1.22	1.37	1.29	1.15	1.59		1.37	
EM external regulation	5.21	5.48	5.30	4.87	5.58	5.17**	4.76	5.04	4.87	4.18	4.78	4.44	5.54	0.001	
	SD	1.05	1.23	1.12	1.13	1.14	1.18	1.30	1.33	1.33	1.27	1.34		1.32	
Amotivation	2.06	1.44	1.84*	2.39	2.26	2.33	2.26	3.51	3.32	3.06	3.71	3.14**	14.68	0.001	
	SD	1.43	0.76	1.27	1.35	1.66	1.48	1.66	1.45	1.60	1.83	1.69		1.69	
Sample size	N	54	30	84	41	31	72	32	21	59	25	19	44	-	

Note. IM - intrinsic motivation; EM - extrinsic motivation; Fem – females; Gender differences: * $p < 0.05$; ** $p < 0.01$

Statistically significant changes of EM subscales and amotivation indicators were observed during the study period. The lowest scores of all EM subscales were observed in the 4th year, and they were statistically significantly different compared to the observed mean of scores in the 1st year: *EM – identified subscale* $d = 1.15$ ($p < 0.001$), *EM – introjected subscale* $d = 0.70$ ($p = 0.021$); *EM – external regulation subscale* $d = 0.96$ ($p = 0.001$). Statistically significant decrease in the indicators of EM were observed between the 2nd and 4th year: *EM – identified subscale* $d = 1.03$ ($p < 0.001$); *EM – introjected subscale* $d = 0.82$ ($p = 0.005$); *EM – external regulation subscale* $d = 0.73$ ($p = 0.01$). Thus, it can be stated that the EM of students was less expressed at the end of studies than at the beginning.

The students' amotivation increased from the 1st (1.84 ± 1.27) to the 3rd year (3.32 ± 1.60) ($p < 0.001$). However, in the 4th year it slightly decreased ($p = 0.996$), which states that the expression of amotivation in the second half of studies is higher than in the first year.

The results of AcM by gender (Table 2) show no statistically significant differences in the IM between males and females. Differences were observed only in two subscales of EM and only in particular study years. In the 2nd and 4th study year female (F) scored higher than male (M): in the 2nd year *EM – external regulation* (M

4.87±1.13; F 5.58±1.14, $p = 0.01$), in the 4th year EM –identified (M 4.17±1.36, F 5.05±1.18, $p = 0.029$). Differences in amotivation by gender were observed in the 1st and 4th years: men's amotivation was more expressed than women's (in the 1st year M 2.06±1.43; F 1.44±0.76; $p = 0.033$; in the 4th year M 3.71±1.69; F 2.39±1.41; $p = 0.009$).

Students' satisfaction with studies

Table 3 presents the indicators of the CEQ subscales in terms of study years and gender. The data show that the indicators of the four subscales changed statistically significantly during the study period.

Table 3
Descriptive statistics (Mean- M, Standard Deviation - SD) and F-test statistics for student satisfaction with academic studies by current year level and T-test statistics by gender

Variables	1st year			2nd year			3rd year			4th year			F	p
	Men	Fem	Total	Men	Fem	Total	Men	Fem	Total	Men	Fem	Total		
Quality of teaching	M 35.49	36.49	35.84	28.57	2.37	28.04	12.28	5.16	7.38	22.67	22.37	22.54	7.96	0.001
Clear goals and standards	M 24.07	23.33	23.81	20.12	16.94	18.75	10.2	16.07	10.66	9.5	19.74	13.92	2.94	0.034
Appropriate Workload	M -6.04	-16	-9.63	12.97	10.63	11.88	12.29	18.57	12.74	7.2	-18.42	-3.86*	7.87	0.001
Appropriate assessment	M 4.95	-8.04	0.46	0	0.83	0.35	-5.07	9.52	0.42	16.5	0.66	9.66	1.12	0.344
Autonomy	M 22.96	20	21.9	13.33	22.5	17.3	0.79	-9.05	-4.43	9.6	10.53	10	11.12	0.001
Sample size	N 54	30	84	41	31	72	38	21	59	25	19	44	-	-

Note. Fem – females; Gender differences: * $p < 0.05$

In the subscale of *Quality of teaching*, the lowest indicator was observed in the 3rd study year, and it was statistically significantly different from the 1st ($p < 0.001$) and 2nd year ($p = 0.016$). Thus, the survey data show that students positively assess the quality of teaching.

In the subscale of *Clear goals and standards*, students' indicators show a statistically significant decreasing trend during the first three years of study ($p = 0.028$). The increase of this indicator in the 4th year was statistically insignificant.

The *Appropriate Workload* subscale revealed statistically significant differences between the 1st and the 2nd ($p = 0.000$) 1st and 3rd ($p = 0.002$) study year. In the 4th year, as in

the 1st year, the observed negative indicator of this subscale shows that students perceive the academic workload as high. No statistically significant difference was found between the 1st and 4th-year indicators ($p = 0.894$).

The lowest indicators in the subscale *Autonomy* were observed in the 3rd year of studies, and this indicator was statistically significantly lower than in the 1st ($p < 0.001$) and 2nd ($p < 0.001$) year. In the 4th year, the indicator of the *Autonomy* subscale tends to increase compared to the 3rd year ($p = 0.052$).

The analysis of the indicators of the CEQ subscale by gender in different study periods shows that only in the 4th year males scores were significantly higher than females on the subscales of *Appropriate Workload* ($p = 0.006$) and *Appropriate Assessment* ($p = 0.034$)

Relationship between students' autonomous, controlled academic motivation and satisfaction with studies

Table 4 shows data on the relationships between autonomous and controlled motivation indicators and those of the CQS subscales. Indicators of both autonomous and controlled regulation have weak yet statistically significant relationships with the indicators of the following subscales: *Quality of teaching*, *Clear goals*, and *standards*, *Autonomy*. There is a tendency that the relationship between autonomous motivation and the mentioned subscales is stronger when compared to controlled regulation. There is a moderate relationship between the indicators of autonomous and controlled motivation. A very weak yet statistically significant negative relationship was found between *Amotivation* and *Quality of teaching*.

Table 4
 Correlations among the students' autonomous motivation and controlled motivation as well as the CQS subscale indicators (Pearson Correlations)

Factor	2	3	4	5	6	7	8
1. Autonomous motivation	0.663**	-0.334**	0.460**	0.391**	0.012	0.019	0.359*
2. Controlled motivation		-0.236**	0.228**	0.244**	0.009	0.090	0.290**
3. Amotivation			-0.195**	-0.093	0.061	0.003	-0.117
4. Quality of teaching				0.543**	0.067	-0.079	0.552**
5. Clear goals and standards					0.129	-0.037	0.350**
6. Appropriate Workload						0.195**	-0.010
7. Appropriate assessment							0.027
8. Autonomy							-

Note. * $p < 0.05$, ** $p < 0.01$

The analysis of the interrelationships of CEQ subscales shows a moderate relationship between the indicators of *Quality of teaching* and *Clear goals and standards*, as well as *Autonomy*. The indicators of *Clear goals and standards* are weakly related to the indicators of *Autonomy*; the indicators of *Appropriate Workload* have a weak correlation with the indicators of *Appropriate Assessment*.

Discussion

Students' motivation during their start in a university reflects their learning motivation created in high school (Hartley et al., 2011), so research data on changes in motivation in a higher education institution may assist in highlighting the factors that help maintain or strengthen students' AcM. The research results obtained will provide a better understanding of the change in AcM regarding students' perceptions of the academic environment revealed through student SS. Understanding and applying these factors can initiate the mobilization of individual efforts by all university community members to consciously create and strengthen their AcM, improve existing PE teacher programmes, or create new ones for conscious and motivated student preparation for professional activities. The conscious and motivated presence of a student in university influences not only his or her behavior during university studies –it even affects their whole future (Blašková et al., 2019).

The research results show that students' AcM changes during the study period and at the end of studies, when compared to the 1st year, amotivation is pronounced more, while the indicators of IM and EM decrease. Research conducted by Brouse et al. (2010) also showed that both IM and EM decreased over the years in college. Comparing the AcM of the 1st and 4th year students, Hakan & Münire (2014) noticed that it was significantly higher for the 1st year students: freshmen had a lower level of amotivation and higher levels of IM and EM. We found that freshmen's level of amotivation is low, and the highest level of amotivation is observed during the third year of study. In the third year of four-year-long PE teachers' studies, indicators showing lower motivation and highest amotivation levels were also observed by Spittle et al. (2009), Spittle & Spittle (2014). Researchers hypothesize that such lower levels in 3rd year could be attributed to university burnout or fatigue, with 1st and 2nd year students still experiencing the “newness” of the course and their profession and a new beginning at the end of the 4th year.

The research results on the effect of gender as a factor on AcM are ambiguous. Some authors (Brouse et al., 2010; Spittle et al., 2009; Vecchione et al., 2014) found that women have higher AcM than men, while other authors' studies show men have both IM and EM higher than women (Hakan & Münire, 2014). Moreover, some researchers (Bedel, 2016; Spittle & Spittle, 2014; Sivrikaya, 2019) did not establish any motivation differences based on gender, as confirmed by our study. Hakan & Münire (2014) also found that women were more amotivated compared to men, although other researchers (Barkoukis et al., 2008; Guay et al., 2015) observed lower levels of amotivation in women than in men. The socio-cultural context may influence such conflicting indicators (Ařeńska et al., 2016).

We established that autonomous and controlled motivation have strong correlations between each other. The research by Wilkesmann et al. (2012) revealed that intrinsic and extrinsic types of motivation are not

conflicting. Thus, as confirmed by the data, it can be assumed that IM and EM, instead of being at opposite poles of the same dimension, can have many complex interrelationships and be influenced by other factors. Moreover, the type of motivation, autonomous or controlled, is likely to be determined by contingencies in the environment in which the behavior is conducted and the features of the behavior itself as well as causality orientations (Deci & Ryan, 1985). Therefore, the revealed connections of autonomous and controlled motivation with the students' perceived academic environment are beneficial in understanding the significance of different educational environment variables for students' self-determination in the chosen profession.

Our study shows that both autonomous and controlled academic motivation indicators have relationships of similar strength with the same subscales of satisfaction with studies. Thus, it can be assumed that some intrinsic and extrinsic aspects of AcM that influence students' decision to continue or discontinue their studies may reinforce each other. Of course, this requires further research, as AcM is influenced not only by factors in the academic environment but also by many individual factors (Wach et al., 2016; Wilkesmann et al., 2012).

However, in terms of academic environment variables, Wach et al. (2016) showed that the motivational construct is mainly related to student satisfaction with study content and conditions. Moreover, the more knowledge students have about studies and the university in general, the more motivated they are – their expectations are related to the general knowledge about the university (Wilkesmann et al., 2012). In addition, certain factors, such as field of study and professional orientation, affect IM and EM differently (Hakan & Münire, 2014; Wilkesmann et al., 2012). This leads to further research on the AcM of other future educators, not only those studying in PE study programmes.

Our study found only one very weak yet statistically significant negative relationship between *Amotivation* and *Quality* of teaching subscale indicators, which suggests that the

reasons for amotivation cannot be explained by academic environment variables alone. Nevertheless, the negative, albeit weak, reliable correlations between amotivation indicators and the quality of teaching may mean that the quality of teachers' work as a component of studies should be considered to strengthen students' self-determination for the chosen profession. The results of the research show students' satisfaction with teaching strategies that help to understand the study goals and direct students to act independently, which is essential for students' AcM. In the 1st and 4th years, students from all CEQ subscales rated the quality of teaching with the highest scores, but it was significantly reduced in the 3rd year. This may be related to the programme's layout, the subjects studied, and the changing concept of quality teaching with increasing experience, but this requires more in-depth research as sufficiently high scores on this subscale are again observed in the 4th year. Thus, the most significant changes in AcM and SS are established in the 3rd year, that is, halfway through the studies; therefore, it is expedient to concentrate more on the research of this study period, which would help reveal the factors of such a "break".

Wach et al. (2016) found that students with higher academic achievement are more satisfied with their study programme implementation conditions, while students who chose to study because of an interest related to the subject specificity (intrinsic motivation) were more satisfied with the study programme content. SS is strongly related to students' perception of progress, their confidence in their abilities, and appropriate social support to achieve learning goals (Lent et al., 2007). The study found sufficiently high positive indicators of freshmen's SS in the *Autonomy* subscale, suggesting that only students entering higher education meet the need for autonomy, which promotes autonomous motivation, according to Ryan and Deci (2000). In the 3rd year, compared to the 1st year, significant adverse changes in students' assessment of the *Quality of teaching*, *Clear goals and standards*, *Appropriate workload*, perceived *Autonomy* subscales allow to

assume the influence of students' experience on individual parameters of assessment of the study environment. Therefore, this points to further research.

Moreover, in terms of factors that strengthen AcM, issues of university culture development are highlighted, stressing the impact of a student-centered educational environment on students' higher perception of their competence, learning benefits, and the ability to apply their experience to other activities and be more autonomously motivated (Levesque-Bristol et al., 2019). According to SDT, in the social context, the relationship between teachers and students during the learning process significantly contributes to the transformation of autonomous motivation into controlled motivation, or vice versa. It depends on the extent to which teachers support their students' autonomy. Besides, it is critical to assess that students have intrinsic motivational resources to engage constructively in the learning environment and strengthen their determination to be PE teachers. The academic environment is characterized by conditions that tend to maintain or destroy the intrinsic motivational resources students bring with them when they come to study. Student motivation and learning environment influence each other, as they use their specific motivational resources to change the learning environment while accepting and internalizing new sources of motivation from the learning environment itself (Reeve, 2012).

Limitations

There are some limitations to the study conducted. We analyzed only the AcMandSS of students who chose pedagogical studies and prepared to become PE teachers. Therefore, the results cannot be generalized to students enrolled in different majors. In addition, we believe that students' AcM during the study period could be better explained by researching different variables, such as student academic achievement, academic self-efficacy, personal characteristics, and different

environment variables. These variables include the programme structure and content, as well as other university organizational factors, such as the AcM of managers and administrative staff. This would also assist in looking for ways to maintain students' AcM and increase SS, which is one of the essential factors for professional continuation.

Nevertheless, the research results are helpful for a better understanding of the career development of pre-service PE teachers. From a practical point of view, the results of the research can be significant for teacher training institutions. These results, which reflect students' views on studies as participants in the study quality system, can provide strategies to increase study quality and satisfaction, which, in turn, should help retain or strengthen students' AcM throughout the study period.

Conclusions

This research shows that the AcM of pre-service PE teachers in Lithuania changes during the study period, and a significant change occurs specifically in the 3rd year of studies. Halfway through the academic studies, the highest indicators of amotivation have been observed. It confirms that this period is important for the decision to pursue a chosen professional career, as amotivation shows that students do not perceive the reasons for their behavior as self-controlled. They are neither intrinsically nor extrinsically motivated. Therefore, it is vital to look for pedagogical approaches during this period to increase students' efforts to pursue their chosen careers, as otherwise, they may eventually cease participating in academic activities altogether. Consequently, developers and implementers of PE teacher programmes should constantly explore students' expectations, perceptions of their future career, and the learning process itself. They should analyze how these concepts change with increasing subject knowledge and skills, as well as after school internships since students' learning experience can be important for their professional development.

Research has established that students' autonomous and controlled motivation levels were relatively high and are strongly correlated. This shows both the students' self-determination for the chosen profession and the importance of external factors for academic motivation. A high level of expression of both types of motivation –autonomous and controlled– is optimal for achieving good study results (Ratelle et al., 2007). Thus, an appropriate academic environment can enhance autonomous academic motivation and students' academic achievement. Weak yet statistically significant positive correlations between both autonomous and controlled motivations and student satisfaction subscales (*Quality of teaching, Clear goals and standards, Autonomy*), as well as the moderate correlations between these subscales, indicate the importance of teaching strategies that motivate students to learn, promote comprehension of learning goals and enable autonomy for professional decision-making.

Therefore, we can assume that the research confirms the importance of the first stage of the career –the study period– for the students' self-determination for the chosen profession. Academic motivation is defined by some authors (Blašková et al., 2019) as the motivation of all members of the academic community (teachers and researchers, administration, students). Thus, it is further appropriate to focus research on the links between the AcM of academic staff, students, and administration and explore how it relates to meeting the basic psychological needs of all participants in the academic community, as well as to their satisfaction with studies/work. Complex analysis of these variables can assist in increasing the quality of studies, which is one of the key factors in ensuring the development of students' motivation in a positive direction when choosing a profession.

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Notes

- * Research article.