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Doctoral Students as Future Teachers at Universities: Factors Related to Professional Identity

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Abstract

Doctoral students' professional identity in higher education institutions is a relevant field of research in the context of education for sustainable development. Higher education institutions face the following challenge: it is very important for the Doctoral students to develop the skills of the researcher during their studies; however, the competencies of the teacher are crucial in order to become part of the higher education institution. Thus, sustainable development of teacher's professional identity of Doctoral students plays a meaningful role in retaining gifted young scientists at higher education institutions. The article analyzes the psychological, social and academic environmental factors that are important for identification of the teacher's professional role during Doctoral studies. The sample of the study consisted of 494 Doctoral students from 22 higher education institutions in Lithuania. The study was conducted using Teachers' Professional Role Identity Scale, Big Five Inventory, Social Support Questionnaire and two scales compiled to measure academic environmental factors. The results revealed that Doctoral students' external thinking style, personality traits of extraversion and conscientiousness, perceived support of family and friends, material conditions for internships and conferences and other academic environment factors are significant for Doctoral students' identification with the teacher's professional role. These results have practical application for Doctoral students' satisfaction with studies, productivity and career management. This is important for the seeking sustainable development goals of higher education.

Key words: doctoral student, PhD studies, professional identity, teaching, teacher role

Introduction

Promoting the reorientation of teacher education and higher education towards sustainability is one of the main goals in education for sustainable development (ESD). This mission is reflected in the UNESCO Chair on Interplay of Tradition and Innovation in ESD, initiated as a targeted development of the Journal of Teacher Education for Sustainability (JTES) and the Baltic and Black Sea Circle Consortium (BBCC) for educational research. This initiative provides an opportunity for ESD researchers and practitioners to be engaged in the networking for creation of deeper personal meaning for sustainable education (Salite et al., 2020).

Higher education is an important actor in the fulfilment of the 2030 Agenda and the United Nations Sustainable Development Goals (SDGs). The integration of the SDGs in universities and the challenges faced when integrating the SDGs in the curriculum and institutional strategies are becoming a field of study under exploration (Murillo-Vargas et al., 2020). The development of Doctoral students' professional identity plays an important role in this field of studies.

Maintaining a healthy and productive identity is essential for professionals in any discipline to not only adapt to the demands of the modern world and different roles, but also to initiate and contribute to positive individual, local, and global changes (Pipere, 2007). Developing an identity as a researcher is an essential task for Doctoral students (Austin & McDaniels, 2006; Grant-Davie et al., 2017; Lamar & Helm, 2017; Mantai, 2017; Pipere, 2007). However, Doctoral students perform many roles in their PhD studies and each role is associated with different contexts, responsibilities, values, and expectations. The multiplicity of professional identity of Doctoral students as well as multiplicity of professional identity of academic personnel were highlighted by many authors (e.g., Austin & McDaniels, 2006; Bereznicki et al., 2014; Coffman et al., 2016; Colbeck, 2008; De Simone, 2001; Jazvac-Martek, 2009; Lovitts, 2005; Rockinson-Szapkiw et al., 2017; Svyantek et al., 2015; Whitchurch, 2010). Teaching, conducting research and providing professional practice are the main activities associated with Doctoral students. Thus, one of the main professional roles that Doctoral students perform during their PhD studies is teacher's professional role since Doctoral students gain educational skills and perform teaching activities regardless of their field of science. This professional role – teacher in the higher education institution – usually is the one which is performed or remained after the completion of PhD studies. Although teacher education is the core concept in the ESD vision, the process of forming teacher professional identity of Doctoral students in the context of sustainability development is poorly explored.

Professional identity is a self-identification with a professional role which a person plays in their job. It reflects personal attitudes, beliefs, commitment to concrete behavior (Pipere, 2007). Professional identity is an inevitable part of ESD and SDG 4 – Quality Education. A strong professional identity is a prerequisite for achieving SDG 4 targets, such as lifelong learning, relevant and effective learning outcomes, knowledge and relevant skills for decent work. Professional identity is strongly related to a teacher's professional qualification or, as Veisson and Kabaday (2018) state, a teacher's professionalism, which is one of the major factors for the quality of education and sustainability.

The formation of a professional identity is an important component of a sustainable education and part of 'becoming a teacher' process. This process is a continuum of experience that begins when a student starts to work in the teaching field and continues throughout the whole teacher's career. Studies show that the quality of education for learners depends on sustainable training and supply of qualified teachers (Nketsia et al., 2020). According to Brandisauskiene et al. (2020), a prerequisite for educational quality is the professional development in teaching activities and that is why "it becomes necessary to look for professional development factors that could be relevant to sustainable professional development" (Brandisauskiene et al., 2020, p. 153). However, especially in the higher education sector, factors related to professional development and identity are not explored deeply enough (Clarke et al., 2013), even though this is important not

only for the quality of education but also for personal well-being (Acton & Glasgow, 2015; Day & Kington, 2008; Kosic & Dimitrova, 2017; McNair, 2017; Pellegrino, 2015; Tang & Ferguson, 2014).

The construction of a Doctoral student's professional identity depends on implementation of certain professional roles. Identification with a certain professional role and commitment to that role are the results of socialization process (Weidman et al., 2001). Lovitts (2001), Gardner (2007), Austin and McDaniels (2006) also emphasized the importance of socialization in the PhD studies. Researchers have focused on understanding how the new members of the academic community recognize and take over the norms and expectations in the new (academic) environment, as well as in future profession. Professional identity is related to self-confidence in activity and understanding of one's abilities and potential (Krabi, 2008). Professional identity is associated with making decisions about one's future profession, becoming a member of a particular profession group and a full understanding of one's abilities and professionalism (Smitina, 2010). Professional identity leads to work efficiency (e.g., Sammons et al., 2007), motivation (e.g., Oyserman & James, 2011; Smitina, 2010), innovative behavior (e.g., Adarves-Yorno et al., 2007) and involvement (e.g., Sohrabi et al., 2011). In the academic context, professional identity is a major element for understanding career decision-making of Doctoral students (Hong, 2010). Teacher professional identity can be associated with the ability to sensitize deeper sustainability consciousness (Jetly & Singh, 2019) or what Petrinko (2019) calls wise education and wisdom of the teacher. However, at higher education institutions, the lack of attention is paid to the formation of a teacher's professional identity in PhD studies (McAlpine & Norton, 2006; Martinsuo & Turkulainen, 2011; Rasanen & Korpiaho, 2011).

Usually, people acquire identity from the social categories to which they belong and from their personal characteristics that are compatible with the specific characteristics of a particular social group, allowing them to act within a particular social group while performing a certain role. (Jazvac-Martek, 2009; Stets & Burke, 2000; Stryker & Burke, 2000). Therefore, professional identity is a psychosocial process and the concept of professional identity integrates both identity and social identity theories. From the perspective of identity theory, professional identity is defined as a relatively stable set of traits, attitudes, values, motives, experiences and relationships which allow people to define their professional role (Dobrow & Higgins, 2005; Ibarra, 1999; Stryker & Burke, 2000). From the perspective of social identity theory, the professional identity includes the knowledge of person's membership in a group, as well as evaluation and feelings regarding that group (Tajfel, 1982; Tajfel & Turner, 1979).

In this research systems theory, the main principles of ESD are used to emphasize a holistic approach to personal career, considering all important elements of the system, where the person is an active actor of personal career management (Patton & McMahon, 2006). In the context of the systems theory and ESD, the psychological, social and academic environment elements can be considered factors that possibly explain teachers' professional identity of Doctoral students. According to the main ideas of the systems theory and ESD modelling, the interaction of factors (complex analysis) may have an advantage over the analysis of single factors. It is further explained why and what psychological, social, and academic factors may be associated with a teacher's professional identity in a university context.

Psychological factors (such as personality traits, values, thinking style, and others) could be considered as the most important ones because peculiarities of personality remain relatively stable over time (Guseva et al., 2009). The individual characteristics determine the propensity to certain activities. The importance of self-knowledge in the process of choosing a profession is evident, because people understand who they are and how successfully they will be able to perform in their chosen professional field (Dubinas, 2006). When a person assesses the situation as unfavorable, the decision of leaving or staying in a chosen professional field depends on the personality characteristics (Steinmayr & Spinath, 2008).

Social relations, cooperation, support and encouragement are important factors in shaping professional identity, as many professionals are not completely independent in their work (Akerlind & McAlpine, 2017; Smith & Hatmaker, 2014). Social support from a variety of sources (research supervisor, colleagues, family and others) contributes to the growth, professional development and success in the study process of Doctoral students. A vast majority of studies on the formation of Doctoral students' professional identity have examined the role of social relations (Baker & Lattuca, 2010; Chapman et al., 2009; Ghosh & Githens, 2009; Martinsuo & Turkulainen, 2011; Sweitzer, 2009) and its perception (Colbeck, 2008; Dobrow & Higgins, 2005).

The previous research emphasizes the support of scientific supervisor (Baker & Lattuca, 2010; Ghosh & Githens, 2009; Martinsuo & Turkulainen, 2011; Sweitzer, 2009) and the scientific community/faculty (Carter, 2006; Chapman et al., 2009; Ghosh & Githens, 2009; Ibarra et al., 2005; Kim & Karau, 2009; Lamar & Helm, 2017; Smith & Hatmaker, 2014). External support, for example, from the employer (Malfroy & Yates, 2003), community of practice (Coffman et al., 2016) or family and friends (Maher et al., 2004) may also play an important role in formation of Doctoral students' professional identity.

There is a lack of studies analyzing the environmental factors of the university context in the formation of Doctoral students' professional identity. However, although studies in this area are still in their infancy, the existing research reveals that the characteristics of the academic environment of Doctoral students are considered to be significant variables in the formation of professional identity (Kim & Karau, 2009; Lambie & Vaccaro, 2011).

In the context of existing research, the teacher's identity of Doctoral students is not common or frequent research object in quantitative research. The authors of the present study seek to expand the field of existing quantitative research in this field and aim to examine what different factors are important for a teacher's identity in Doctoral studies.

The following research questions are addressed:

- 1) What psychological factors are important for a teacher's identity in Doctoral studies?
- 2) What social factors are important for a teacher's identity in Doctoral studies?
- 3) What academic environmental factors are important for a teacher's identity in Doctoral studies?
- 4) How does the interaction of psychological, social and academic factors affect teacher's identity in Doctoral studies?

Thus, the main aim of the study is to present a comprehensive profile (consisting of psychological, social and academic factors) for teacher's identity of Doctoral students.

Methods

Participants

A total of 494 Doctoral students (66 % females and 34 % males) from 22 higher education institutions in Lithuania participated in the study. The average age of participants was 30.5 years. The sample consisted of all fields of science excluding the Arts: Social (34 %), Biomedical (19.6 %), Technological (15.8 %) and Physical Sciences (15.8 %), Humanities (10.7 %) and Agriculture (4 %). The participants were from 45 different Doctoral study programs. Most of respondents (92.3 %) were full-time students, working outside the university (58.7 %) and having teaching experience at university (60.5 %). Distribution of Doctoral students by year in Doctoral studies: 1st year – 24.3 %, 2nd year – 22.9 %, 3rd year – 23.9 %, 4th year – 23.9 %, and 5.1 % were those who have already finished their studies but have not publicly presented their Doctoral Thesis yet.

Instruments

In order to assess the importance of psychological, social and academic factors for the expression of Doctoral student's professional identity (teacher's role), a research questionnaire was constructed.

The Teachers' Professional Role Identity Scale from Doctoral Students' Professional Identity Questionnaire (Kovalcikiene & Buksnyte-Marmiene, 2013) was used to measure how strongly the identity of teacher's professional role was expressed (9 items; Cronbach alpha in this study – .858). The response format for the items was a 5-point Likert scale. The example of item: "I have enough didactic knowledge and skills, so I know how to work with students effectively". Doctoral students who have highly expressed teacher's professional role identity realize that they fit educational activities, have attitude and values necessary for a good teacher, feel self-confidence and are satisfied working with students, as well as feel being part of teachers' community, have sufficient knowledge and skills to undertake such work.

Psychological factors include personality traits and thinking styles. Personality traits were measured using the Big Five Inventory (BFI) (Benet-Martinez & John, 1998; John et al., 1991; John et al., 2008). The inventory consists of 44 short phrases (e.g.: "I think I am ... full of energy; I like to collaborate with others"), which respondents rated on a 5-point Likert scale. Cronbach alpha for personality traits in this study: extraversion – .796, agreeableness – .690, conscientiousness – .782, neuroticism – .836, and openness to experience – .786. Thinking Styles Inventory (TSI) (Sternberg & Wagner, 1992) consists of 65 items (short version). The response format for the items was a 7-point Likert scale. The example of an item: "I prefer to deal with specific problems rather than with general question"; "I tend to pay little attention to details". Cronbach alpha for thinking styles in this study: legislative – .772, executive – .745, judicial – .779, hierarchical – .750, oligarchic – .754, monarchic – .737, anarchic – .552, global – .578, local – .665, external – .837, internal – .706, liberal – .867, and conservative – .872. Although the internal reliability of some sub-scales is low, it is sufficient to use it in a quantitative measurement of groups. The authors of this study obtained permission to use these instruments in the current study. Also, the double translation of the instruments was performed by the authors of the study.

Social factors were measured using Social Support Questionnaire (Kovalcikiene, 2013). This questionnaire could be useful for understanding the subjectively perceived social support of Doctoral students. The questionnaire consists of 16 items with four scales (4-item in each): support of scientific supervisor ($\alpha = .916$), support of colleagues and other students ($\alpha = .820$), support of family and friends ($\alpha = .777$), and support of employer (scale for working students; $\alpha = .968$). The response format for the items was a 5-point Likert scale. The example of an item: "I get enough help from my scientific adviser".

Academic environment factors of Doctoral students were assessed using two scales composed by the authors specifically for this study. Firstly, respondents were asked how much time per week on average they spent for various Doctoral activities: at university, at home, and how much of it – for elaboration of the Doctoral Thesis. Respondents were asked to select an answer on a scale from 0 to more than 40 hours (0 hours; 1 to 8 hours; 9 to 16 hours; 17 to 24 hours; 25 to 32 hours; 33 to 40 hours; > 40 hours). Secondly, respondents were asked to rate on a 5-point Likert scale whether the university provided sufficient material facilities for various Doctoral student activities: internships, conferences, research material, methodologies, books, etc.

Data Analysis

The SPSS version 22.0 and Amos version 22.0 were used for the statistical analysis of empirical data. Several parametric statistical criteria, such as multiple linear regression and structural equation modelling were used to answer the research questions.

Results

The results of the study revealed that certain psychological, social, and academic environment factors were of significance for Doctoral students' identification with teacher's professional role. The results of multiple linear regression revealed that psychological factors such as external thinking style ($\beta = .158, p < .01$), hierarchical thinking style ($\beta = .111, p < .05$) and lower oligarchic thinking style ($\beta = -.116, p < .05$) along with personality traits such as conscientiousness ($\beta = .114, p < .05$) and extraversion ($\beta = .187, p < .01$) predicted a more expressed teacher's professional role identity of Doctoral students.

Social factor that has the significant predictive value for the teacher's professional role identity of Doctoral students is the perceived support from family and friends ($\beta = .088, p < .05$). The more Doctoral students realize they receive social support from family and friends, the more they identify themselves with the role of teacher.

The academic environment factors are also very important for teacher's professional role identity of Doctoral students. It was found that better material opportunities for internships and conferences ($\beta = .178, p < .01$) and worse material opportunities for research material preparation ($\beta = -.119, p < .05$), less time spent at the university ($\beta = .160, p < .01$), but more for Doctoral Thesis writing ($\beta = .142, p < .01$) predict a more pronounced teacher's professional role identity of Doctoral students.

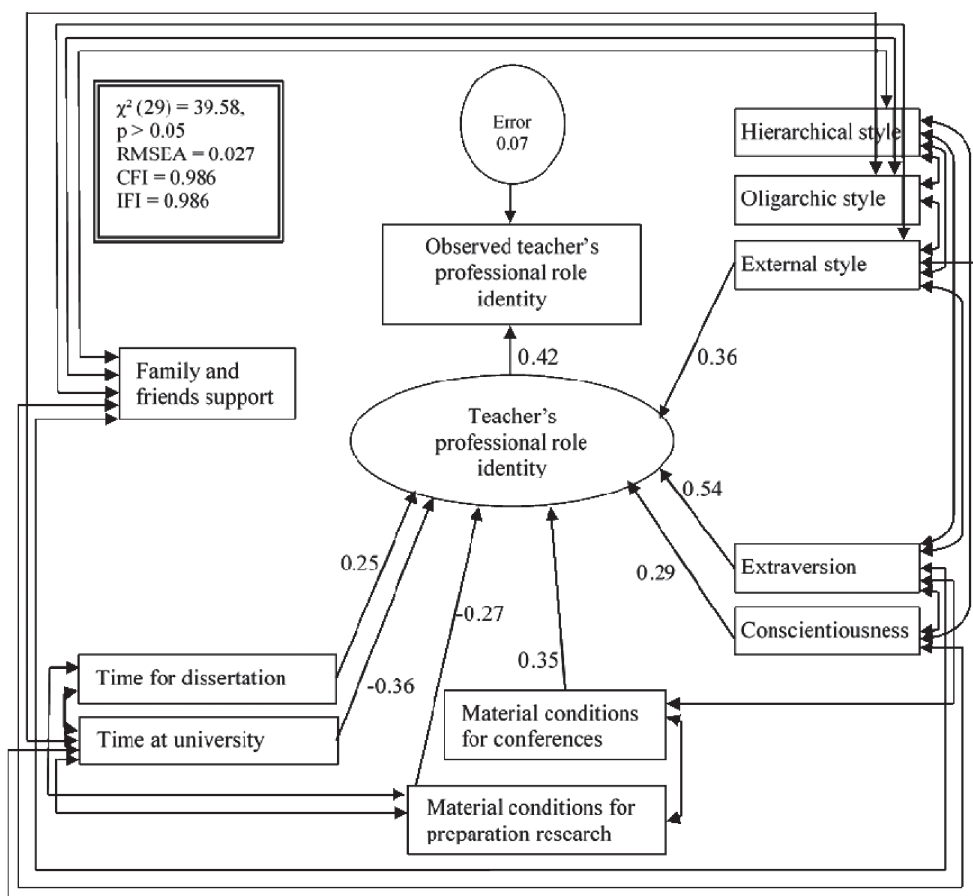
In order to model the interaction among the factors, to approve the results of lower level (regression) analysis as well as to investigate a theoretical model by taking into

account the hypothetical causal relationships among the variables, a structural equation modelling was conducted. Specifically, the structural equation model for teacher's professional role identity was run to evaluate the importance of psychological, social, and academic environment factors.

Structural Equation Modelling (SEM) was performed to determine the hypothetical causal relationships among the variables under consideration – teacher's professional identity of Doctoral students and psychological, social and academic environment factors. The results of SEM indicated that the model of the teacher's professional role identity (Figure 1) describes the survey data appropriately and does not differ from the data ($\chi^2 (29) = 39.58, p > .05$).

Figure 1

Model of Hypothetical Causal Relationships for Teacher's Professional Role Identity of Doctoral Students



Note: single-sided arrow – statistically significant relationship ($p < .05$); double-sided arrow – correlation; standardized regression weights are indicated; intercorrelations of independent variables are considered.

Also, the model has well goodness of fit statistics: application of the root mean square error of approximation (RMSEA = .027), comparative fit index (CFI = .986), and the incremental fit index (IFI = .986). The model shows that external thinking style, extraversion and conscientiousness, material facilities for internships or conferences, more time allocated for elaboration of the Doctoral Thesis and less time spent at the university, as well as less importance of facilities for research material have a positive effect on the Doctoral students' identification with the teacher's professional role. The analysis of interconnectedness among independent variables revealed that Doctoral student's inclination to communicate and focus on people (external thinking style), as well as extraversion and conscientiousness served as mediators between perceived support of family and friends and teacher's professional role identity. Also, hierarchical thinking style and oligarchic thinking style do not directly affect Doctoral students' identification with teacher's professional role, but their removal reduces the model compatibility with the data indexes. These two thinking styles are important through significant linkages with other variables.

To sum up, it is important to mention the overall value of interpretability. The squares of multivariate correlation coefficients show that (latent) variable data depend on the set of independent variables. For teachers' professional role identity model, 17.8 % of the data depends on the psychological (personality traits of extraversion, conscientiousness and external, oligarchic and hierarchical thinking style), social (support from family and friends) and academic environment (material facilities for scientific trips, research material preparation, time for various activities at universities and time for the elaboration of the Doctoral Thesis) factors. Despite the fact that general explanation of variation is small and the results should be interpreted with caution, such an explanatory variable dispersion is a common phenomenon in psychological research data analysis.

Discussion

The 2030 Agenda approved by the United Nations in 2015, for the first time, includes universities as significant players in achieving SDGs (Murillo-Vargas et al., 2020). In such a context, Doctoral student's transformation to teacher's professional role becomes the key aspect in fulfilling the ESD principles in practice. Moreover, although the role of school teachers in achieving the goals of sustainable development is analyzed, the role of teacher's professional identity of Doctoral students, in the context of achieving the ESD goals, lacks the attention of researchers.

The teacher's professional role is one of the most important that Doctoral students perform besides the researcher role during their PhD studies. Scientists (Austin & McDaniels, 2006; Bereznicki et al., 2014; Coffman et al., 2016; Colbeck, 2008; De Simone, 2001; Jazvac-Martek, 2009; Lovitts, 2005; Rockinson-Szapkiw et al., 2017) emphasize that each role is associated with different contexts, responsibilities, values and expectations. Thus, the present study analyzes the psychological, social and academic factors that are relevant to teacher's professional role identity of Doctoral students. Nevertheless, when analyzing the importance of psychological, social and academic environment factors it is also important to consider the socio-demographic characteristics of Doctoral students (such as gender, age, field of science, study year, work experience outside the university, teaching experience, etc.). Though it was not the aim of the present research, the results of other studies (e.g., Knox, 2006; Oyserman & James, 2011; Rockinson-Szapkiw et al.,

2017), show that these characteristics are important for professional identification. This can be seen as a limitation of this study and should be taken into account in future research.

The results of this study revealed the importance of certain specific psychological, social and academic environment factors for teacher's professional role identity of Doctoral students.

Regarding the psychological characteristics, conscientiousness, extraversion, and external thinking style can be seen as evidence of a higher identification with teacher's professional role. Conscientious people are hard-working, accustomed to planning, organizing, achievement oriented (John & Srivastava, 1999) and are associated with career decision-making self-efficacy (Hartman & Betz, 2007), self-regulation (Hoyle, 2006). Extraverted people are sociable, forceful, energetic, adventurous, enthusiastic, outgoing (John & Srivastava, 1999), and external people seek to work collaboratively (Heidari & Bahrani, 2012; Zhang & Sternberg, 2005).

It can be concluded that these personality characteristics are essential in the academic context and especially for teacher's professional role identity since these psychological characteristics of personality are associated with person's commitment to professional and interpersonal activities. For example, conscientiousness is associated with the success of a person's professional life (Busato et al., 2000; Nofle & Robins, 2007; O'Connor & Paunonen, 2007); extraversion is associated with better job performance if that job includes interpersonal relationships (Tokar et al., 1998). The tendency to communicate and to work with other people is one of the key aspects in teacher profession.

Considering the results of social factors, subjectively perceived support from significant others is indirectly important for Doctoral students' identification with teacher's professional role. Support from family and friends was already determined as the meaningful factor for professional identity formation in PhD studies in previous studies (e.g., Maher et al., 2004; Malfroy & Yates, 2003; Sweitzer, 2009; Weidman et al., 2001). On the other hand, identification with teacher's professional role is associated with higher extraversion and external thinking style. These personality characteristics reflect a tendency to seek out social stimulation and communication with others. This may explain the importance of support of significant others (family members and friends).

Regarding the relationships between academic environment factors and teacher's professional identity of Doctoral students, the findings showed that higher identification with teacher's professional role was associated with better material facilities for internships, conferences and not for research work itself. Also, higher identification with teacher's professional role is associated with tendency to spend less time at the university but allocate enough time to the elaboration of the Doctoral Thesis. This means that Doctoral students with teacher's identity like to travel and participate in scientific events, do not favor spending time at the university without lecturing (in Lithuania, Doctoral students participate in various other activities not related to teaching), and are eager to elaborate their Doctoral Thesis. In fact, the results call for further research with a deeper examination of the Doctoral students' academic environment factors.

Finally, the results have practical implications for Doctoral students' education, satisfaction with the studies, productivity, career monitoring and management. Given that certain psychological factors are related to a teacher's professional identity, career counselling and self-discovery are tools for successful career management of Doctoral students. In addition, the results can be used for professional development, socialization or career management training and for strengthening the role of the university teacher.

Thus, in a broad sense, it is important for the sustainable development of higher education to retain talented researchers to work at higher education institutions.

Conclusions

The authors of the present study aimed to examine different factors that are important for a teacher's professional identity of Doctoral students, as well as to present a comprehensive profile (consisting of psychological, social and academic environment factors) for identification with teacher's role, which can be viewed as an important part of professional identity in the context of higher education.

Assessing psychological factors as the most important and relatively stable over time, it can be concluded that Doctoral students with teacher's professional role identity are communicative, active, talkative, enthusiastic or optimistic; they are also characterized by such qualities as orderliness, thoroughness, self-discipline, and prudence. These characteristics can be seen as a precondition for better pedagogical and didactic performance as well as the quality of teaching.

With regard to social factors, it can be summarized that subjectively perceived support from the family and friends is a significant factor for teacher's professional role identity of Doctoral students. Identification with teacher's professional role is considered sensitive to the social sphere and feedback; thus, in order to perform a role, social attention and support are needed. The importance increases if Doctoral students have a high level of external thinking style, extroversion and conscientiousness.

Among the academic environment factors that are important for Doctoral students' identification with teacher's professional role are the material facilities for internships and conferences, as well as the tendency to spend less time at university, but allocate enough time to the elaboration of the Doctoral Thesis. This may be typical of the Lithuanian context; therefore, future research is desirable.

Finally, the results of the study highlight the need for higher education institutions to take into account (for example, through various professional development programs) the psychological, social and academic factors of Doctoral students in order to retain talented teachers (not just researchers) and ensure sustainable development of teacher's professional identity.

Recommendations and Implications for Sustainable Development of Teacher's Identity Within Doctoral Studies

Professional identity is a significant factor in determining person's professionalism and career success in the context of ESD. The development of teacher's professional identity of Doctoral students is important for the quality and effectiveness of becoming a teacher at higher education institutions. The results of the study reveal that different psychological, social and academic environment factors are important for teacher's professional identity of Doctoral students. Moreover, it can be stated that in order to reveal the characteristics of the formation of a Doctoral student's professional identity, a detailed profile (consisting of psychological, social and academic factors) is required rather than an analysis of single factors. In other words, the holistic approach, which is the core principle of sustainable development and also the core principle of ESD is valuable in analyzing teacher's professional identity of Doctoral students.

First of all, it means that both higher education institutions and Doctoral students themselves should pay more attention to the formation of teacher's professional identity as a factor encouraging integral development of a person, and such thinking "could lead to a qualitative change in human activities and actions, to ensure the searching direction towards sustainable development" (Petrinko, 2019, p. 67). Such an approach correlates with the ESD principles that education is not only intended to provide fragmentary knowledge in different disciplines and to verify academic performance, but also to ensure the harmonious development of the personality.

Secondly, higher education institutions should take into account those social and academic environmental factors that are important for teacher's professional identity of Doctoral students in order to promote sustainable development of it (teacher's identity) and strive for lower drop-out rates, higher satisfaction with Doctoral studies, career clarity and higher quality of teaching activities. The results of the study suggest that providing social and academic support to Doctoral students is crucial for their teacher's professional identity. Therefore, it is recommended to form a sustainable attitude in educational policy that Doctoral study programs should be improved not only in terms of content, but also in terms of the psychological characteristics of Doctoral students, relations with members of the community, and working conditions. Thus, this study is an undoubted contribution to the formation of a sustainable development strategy in higher education institutions. It should also be noted that all education stakeholders (universities, government, etc.) must participate to support the sustainable competency development and improvement of Doctoral students. Sustainable professional development must be a shared responsibility, and a synergy can be achieved if various parties are involved and committed (Sumaryanta et al., 2019). Developing continuing education programs and reorienting continuing education to sustainable, it is important to extend and deepen the cooperation of university and its graduates for social innovation creation and education quality achievement for sustainable development (Salite et al., 2016).

Scaife (2012) argues that the process of becoming a teacher consists of three stages of learning, teaching, and surviving. This idea and the results of our research, which reveal the importance of social support for Doctoral students, suggest that not only training for professional development and Doctoral student's professionalism significantly contribute to the formation of a teacher's professional identity, but also the Doctoral student's socialization process in higher education institutions, opportunities to participate in career management training programs for Doctoral students and receive a career counselling service when needed. It is recommended to develop specific career management programs based on the identified factors relevant to the professional identity of Doctoral students.

Sustainable personal development, based on the values of sustainable development, is important facilitator for person's career success and greater satisfaction with their life (Briede & Drelinga, 2020). Self-reflection and self-knowledge are important tools for a successful teacher's professional identity and career. Therefore, it is recommended for Doctoral students to participate in professional development programs, seminars or trainings. A clear understanding of professional identity is important for finding their own professional way. In this way, Doctoral students could better understand in which areas they are strong and how they can benefit from it, and thus contribute to the achievement of ESD goals.

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