

Differences in Motivation of Choosing Teaching as a Profession Among Teacher Trainees of STEM and Non-STEM Study Programs

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Abstract– Due to relatively easy step into the teaching study programs in the Slovak Republic, universities accept students who don't have intrinsic interest in teaching and developing their competencies, such as narrativity, creative and critical thinking. The aim of the paper is to identify differences in motivation of career choice among students of different study programs. Specifically, we focus on the differences in the types of motivation among teacher trainees of STEM and non-STEM study programs. The types of motivation were surveyed on a sample of 460 teacher trainee students using SMVUP3-S questionnaire. The study has found a significant difference between the research groups in following types of motivation: alternative choice, competence and work with youth.

Keywords– teacher, motivation, career choice, teaching profession.

1. Introduction

In the last decade it has been renewed the interest for better understanding what motivates students to choose teaching as a career. We can conclude that the

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interest in this issue has a cyclical nature and it is renewed every ten to fifteen years [1], [2], [3]. This fact is probably contingent by changes in the structures of society, such as social status, income, increase of the requirements of teacher professional profile, economic situation etc. Each phase has a direct impact on the personal characteristics of individuals, which also leads students to different considerations about choosing perspective career. This issue has been studied in a variety of samples, or given in the context of the various variables, however, mostly on samples of American or Australian students.

Explicit exploring types of motivation in different study programs have been initiated only recently, so the issue is not adequately reviewed and it's limited to certain geographical areas [4], [5]. Although some empirical studies show the differences in motives of choosing teacher as a career with regard to career studying program, it remains doubtful, in which variables (types of motivation) varied with student teachers of the Slovak Republic, taking into consideration the differences and the specifics of higher education and the teaching profession in this society.

2. The theoretical and empirical bases

In the educational literature, similar types of motivation of choosing teaching as a career have been emerged in various forms and combinations. Existing studies indicate three primary categories of motivation [6], [7], [8], [9]: intrinsic, extrinsic and altruistic. Nevertheless, it is necessary to differentiate the various motives in particular category and examine them as specific factor because the respondent may score high/low in all the factors in

one category of motives, or he may score low and high in another category of motives [10].

As the most commonly cited theoretical model of choosing teaching profession is Richardson's and Watt's FIT-Choice model [11]. The model is grounded in expectancy-value theory, which argues that individuals' choices and behaviors are shaped by their expectancies and their values [13], [14]. This model assumes that the choice of the teaching profession is affected by *perception of self* (ability to learn); *perception of tasks* (job requirements: expertise and the benefits of the work: social status and income); *values* (personal value: job security, time for family, professional mobility, and social value: impact on children and youth, asset for social equality, asset for society, working with children and youth); *social impacts* (significant others, previous experience in teaching and learning) and choosing teaching as an alternative profession.

Most frequent motives of choosing teaching as a career are altruistic motives and intrinsic motives which correspond with the contents of the profession. The initiative of intrinsic motivation comes from personality structures, therefore, is much longer-lasting and more efficient than other types of motivation [15], [16]. Category of intrinsic motives includes e.g. the motive of competence/experience [17], the motive of interest [12] and the motive of professional potential, which are closely related to the first two, (perspective of the individual plans to build professional persona and improvement [4]. Category of altruistic motives, which we understand as a desire to improve the well-being of others, includes the motive of prosociality and motive of interest to work with children and adolescents [12], [18], [19], [20].

In the context of the issues appear extrinsic motives, which are also heavily represented in the career choices. Extrinsic motives are interpreted as a problematic factor in teachers' career choices, because an individual achieves higher performance with extrinsic motivation, but only in the short term. The fundamental problem with extrinsic motivation is dissatisfaction with work which is reflected in the activities and affects social relations at the work place [21], because the interest and the competence of the individual may not correspond with the nature of the profession [22].

The most frequent types of extrinsic motives in psychological and educational literature are: reliable income [22], [23], holidays [19], job security [24], benefits/time for the family and children [12], an alternative career choice (*choosing teaching profession as a last/alternative solution*; [13], [25], [26] and influence of others (parents, siblings, peers etc.) [22], [27].

Levels of different types of motivation depend on many factors. Despite the lack of empirical studies, some researchers suggest that the types of motivation depend also on the study program, to which the students report [5]. The researchers in the national studies published in 2001 found that among the graduates in the STEM study programs (Science, Technology, Engineering and Mathematics), there is lack of interest in teaching [28].

The lack of interest of students of STEM study programs can be caused by a wide range of study options currently offering STEM (nonteaching) study programs which allow more lucrative career options after graduation [25]. This fact is reflected in the following statistics: in a study by McInnes et al. [28] there was found that there were very few graduates in the STEM study programs, as an alarming were following teacher study programs: mathematics (2%), natural sciences (4% to 7%) and informatics (0%). For example, as was shown in a study of Lokan et al. [26] on sample of the Australian and New Zealand teachers, more than half of researched samples would prefer a career change. Another study which confirms previous results states that up to 39% of the teachers of mathematics were undecided whether they want to continue to work as teachers, and 16% of teachers actively planned to leave the teaching profession [25].

A study that compares motives of choosing teaching as a profession on a sample of Australian students of STEM and non-STEM teaching study programs found differences in following motives of choosing teaching as a profession: *alternative option* (fallback career), where students of the STEM subjects score significantly higher ($F(1,799) = 6.66$; $p = .01$, $n^2 = .008$) in motive of *learning experiences*. Students in STEM subjects score significantly lower in comparison to students of non-STEM subjects ($F(1,799) = 4.46$, $p < .05$, $n^2 = .006$), but were significantly higher motivated by *benefits* of teaching profession and *time for family* ($F(1,799) = 7.38$, $p < .01$, $n^2 = .009$). [22]

The aim of our research is to identify the differences between students of STEM and non-STEM study programs in motivation of choosing teaching as a profession. Based on results of the above research, we can assume that the students in the STEM study programs will reach significantly higher score in the motives *alternative choice* and *benefits*, and significantly lower score in in motives *competence* and *interest* (based on SMVUP3-S questionnaire variables) in comparison with students in non-STEM study programs.

3. Research sample

The research sample consisted of 460 students of teacher trainees (first year of bachelor studies). In order to achieve representative results in the research, the research sample included students of the following universities: Constantine the Philosopher University in Nitra (n = 125), University of Prešov (n = 96), University of Matej Bel in Banská Bystrica (n = 121), and the University of Trnava (n = 118). Research has been categorized into the following groups:

(A) *teacher trainees of humanities, arts and linguistic study programs (n = 259; non-STEM);*

(B) *teacher trainees of mathematics, natural science, economic and informatics study programs (n = 201; STEM);*

The choice of first year students was based on the assumption that there was primary motivation for choosing teaching as a career. Primary motivation of students of higher grades might be modified due to other factors. Research sample consisted of 142 male and 312 female respondents (six persons were uncategorized).

a. Methods

For detecting the motives of choosing teaching as a career of students was used the Scale of motivation for choosing the profession - version for students (SMVUP-S) constructed by Tomšík and Verešová [22]. Individual motives of career choices in the SMVUP model were in scale induced based on empirical and theoretical findings. Existing studies indicate eleven types of motivation of choosing teaching as a career (eight in SMVUP-S and SMVUP2-S version) motivation for choosing the profession:

competence, interest, benefits, income, social status, prosocial behavior, work with children, work with youth, alternative career choice, influence by others (significant others) and professional potential.

Each of the subscale consists of three or four items. Score of the respondents can range from 3 to 4 points as a minimum score to 15-20 points as a maximum attainable score. The higher score represents a higher level of motivation factor. Items of the range are in the form of assertions that the respondent answer on a five-degree of Likert type scale. Cronbach Alpha of scale is 0.86, while at the subscales ranges from 0.75 to 0.82 [29].

4. Results

The results of the statistical analysis are presented in Tables 1. to 3. The statistical analysis was performed by statistical program SPSS ver. 20 and STATA ver. 9. Student t-test for two independent samples was used for the comparison of individual research groups in the variables of the questionnaire SMVUP3-S. To detect data symmetry and distribution we used skewness, kurtosis and Kolmogorov-Smirnov R coefficient.

Skewness of dataset is $S = -0.207$ (non-STEMS = -0.216; STEM: $S = -0.199$), while kurtosis of dataset is $K = -0.300$ (non-STEM: $K = -0.139$; STEM: $K = -0.469$; Table 1.; Table 2.). Analysis was complemented by Kolmogorov-Smirnov Z coefficient. We confirmed the symmetry of the dataset. Kolmogorov-Smirnov Z coefficient for the research sample of students of non-STEM study programs was $Z = 0.949$ ($p = 0.329$), and for students of STEM study programs was $Z = 0.690$ ($p = 0.728$). We chose parametric tests for further analysis.

Table 1: Dataset description of teacher trainees of non-STEM study programs.

Variable	n	Min	Max	M	SD	SEM	S	K
Interest	259	3	15	8.41	3.558	0.282	0.192	-1.093
Competences	259	4	20	14.08	2.901	0.230	-0.556	0.716
Professional potential	259	5	20	14.86	2.717	0.215	-0.503	0.600
Social status	259	4	19	10.30	3.347	0.265	0.383	-0.355
Benefits	259	5	20	12.22	3.060	0.243	-0.038	-0.213
Income	259	4	19	9.49	3.516	0.279	0.208	-0.565
Significant others	259	3	15	7.44	3.254	0.258	0.342	-0.732
Alternative choice	259	3	15	11.40	2.960	0.235	-0.744	0.103
Prosocial behavior	259	8	20	14.61	2.373	0.188	-0.415	0.212
Work with children	259	3	15	10.11	2.715	0.215	-0.524	-0.096
Working with youth	259	4	19	10.30	3.181	0.252	0.383	-0.355

*Note: n- number; Min- minimal score; Max- maximal score; M- average; SD- standard deviation; SEM- standard error of mean; S- skewness of dataset; K- kurtosis of dataset.

In Table 1. there are presented the descriptive data of intensity of individual types of motivation in sample of teacher trainee students of non-STEM study programs. The score of most variables ranging over a median (Md = 12.00, respectively Md = 9 for three-item subscales). Observing average scores for

each variable we assume that the strongest factor for choosing the profession among students of non-STEM study programs is *competence*, *professional potential* and *altruistic motives*. The lowest scored motives are *interest*, *significant others* and *income*.

Table 2: Dataset description of teacher trainees of STEM study programs.

Variable	n	Min	Max	M	SD	SEM	S	K
Interest	201	3	15	8.13	3.649	0.467	0.196	-1.178
Competences	201	4	19	13.01	3.524	0.451	-0.633	0.062
Professional potential	201	7	20	14.59	3.456	0.443	-0.182	-0.828
Social status	201	4	18	10.01	3.413	0.437	0.277	-0.285
Benefits	201	4	19	12.72	3.215	0.412	-0.414	0.449
Income	201	4	18	10.24	3.477	0.445	-0.177	-0.483
Significant others	201	3	15	8.27	3.210	0.411	0.333	-0.253
Alternative choice	201	3	15	9.96	3.610	0.462	-0.276	-0.925
Prosocial behavior	201	8	20	14.39	3.040	0.389	-0.382	-0.746
Work with children	201	3	15	10.08	3.062	0.392	-0.404	-0.588
Working with youth	201	3	15	10.24	3.290	0.421	-0.524	-0.384

*Note: n- number; Min- minimal score; Max- maximal score; M- average; SD- standard deviation; SEM- standard error of mean; S- skewness of dataset; K- kurtosis of dataset.

Strongest factor for choosing the profession among students of STEM study programs is *competence*, *professional potential*, *benefits* and *altruistic motives*.

The lowest scored is the motive of *interest* (Table 2.). Scores of other types of motivation are around the median.

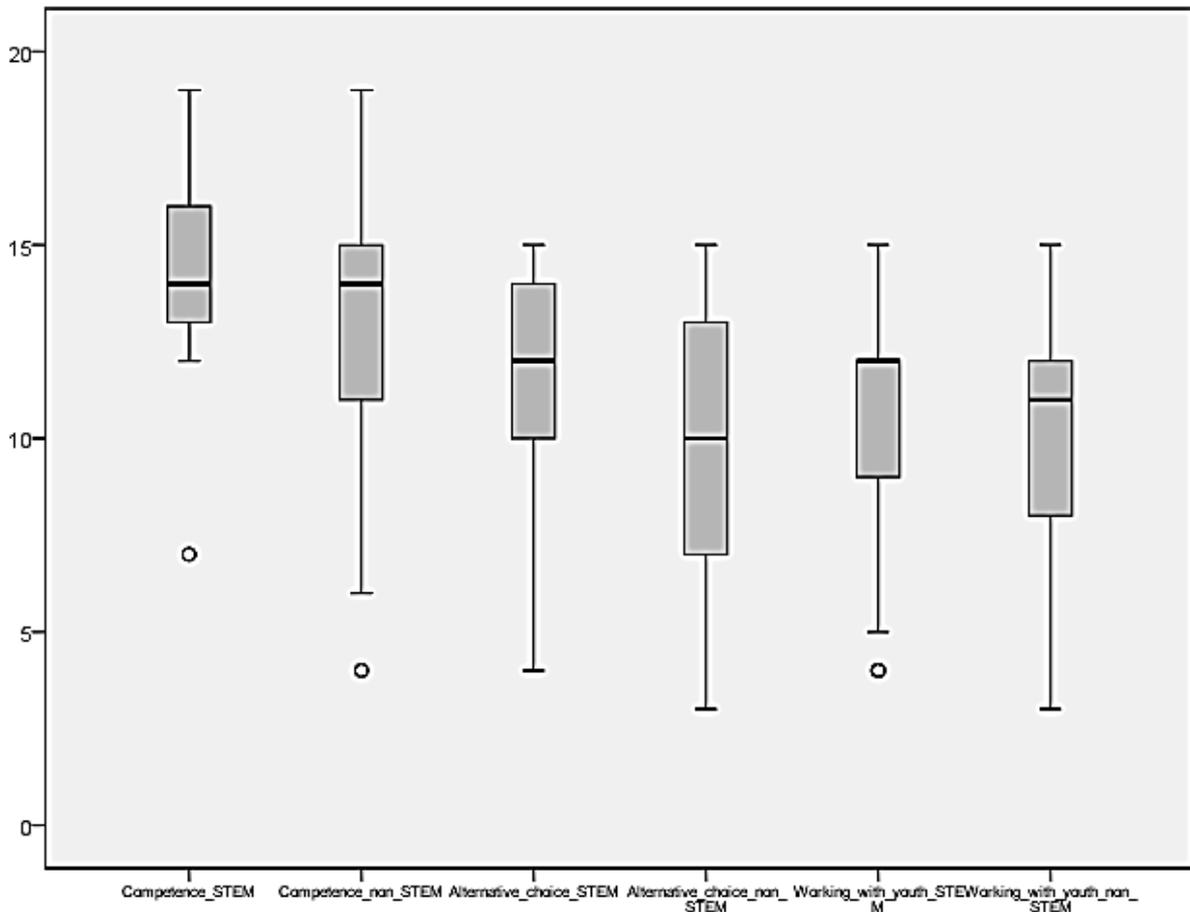
Table 3: Differences in motivation of choosing teaching as a profession between students of teacher trainees of STEM and non-STEM study programs.

Variable	Study program	n	M	SD	SEM	df	t	p
Interest	non-STEM	259	8.42	3.558	0.282	458	0.526	0.599
	STEM	201	8.13	3.649	0.467			
Competences	non-STEM	259	14.08	2.901	0.230	458	2.293	0.023*
	STEM	201	13.02	3.524	0.451			
Professional potential	non-STEM	259	14.87	2.717	0.215	458	0.628	0.531
	STEM	201	14.59	3.456	0.443			
Social status	non-STEM	259	10.31	3.347	0.265	458	0.576	0.565
	STEM	201	10.02	3.413	0.437			
Benefits	non-STEM	259	12.22	3.060	0.243	458	1.072	0.285
	STEM	201	12.72	3.215	0.412			
Income	non-STEM	259	9.49	3.516	0.279	458	1.431	0.154
	STEM	201	10.25	3.477	0.445			
Significant others	non-STEM	259	7.44	3.254	0.258	458	1.717	0.087
	STEM	201	8.28	3.210	0.411			
Alternative choice	non-STEM	259	11.41	2.960	0.235	458	3.036	0.003*
	STEM	201	9.97	3.610	0.462			
Prosocial behavior	non-STEM	259	14.62	2.373	0.188	458	0.575	0.566
	STEM	201	14.39	3.040	0.389			
Work with children	non-STEM	259	10.12	2.715	0.215	458	0.089	0.930
	STEM	201	10.08	3.062	0.392			
Work with youth	non-STEM	259	11.30	3.181	0.252	458	2.170	0.031*
	STEM	201	10.25	3.290	0.421			

*Note: n- number; M- average; SD- standard deviation; SEM- standard error of mean; df- degrees of freedom; t- t-test; p- level of statistical significance; score of subscale Alternative choice is reverse.

In assessing the difference in motivation of choosing teacher profession for each of the categories of the students, we found a statistically significant difference in the variables (Table 3.; Graph 1.): *competence* ($t = 2.293$; $p = 0.023$), *alternative choice* ($t = 3.036$; $p = 0.003$) and *working*

with youth ($t = 2.170$; $p = 0.031$). In all variables students of non-STEM study programs showed higher average score compared to students of STEM study programs. In other assessed variables we didn't found statistically significant differences in the types of motivation of choosing teaching profession.



Graph 1: Significant differences in motivation of choosing teaching as a profession between students of teacher trainees of STEM and non-STEM study programs.

5. Discussion

The results of the study confirmed theoretical and empirical predictions. The study confirmed the differences among students of the various research groups, where students of STEM study programs showed significantly lower scores in the variables *competence*, *alternative choice* and *working with youth*. We assume that the individual components are closely related and influence each other. Lack of interest and competence (teaching skills, abilities and experience) of the students of STEM study programs is most likely related to an alternative choice of the teaching profession. The next problematic facts are also reflected in the lack of other motives, for

example *work with youth* (interest in working in an environment where are children/teens), which we considered as a logical consequence. The contents of the profession do not correspond to the interests and the experience of the students.

The findings support previous empirical claims [4], [5]. Nevertheless we can say that the teacher trainee students of Slovak universities choose teaching profession, in particular on the basis of previous experience with teaching, due to ambition, need for lifelong learning and professional potential, as well by prosocial behavior.

Personality is a structured integrity with all its typical characteristics. These attributes are organized in a unique way and are characteristic for a particular group of individuals. These facts are confirmed by many theories dealing with the structure of the personality, which confirmed the strong relationship between the profession and the structural features of the personality. For example, the theory of personal needs claims whether it's on a conscious or unconscious level that personal needs determine the choice of profession. The theory of needs assumes that the hierarchy of needs determines the personal interests, which are one of the primary motives of choice of profession.

Individuals are trying to realize personal values, hopes, dreams and desires through the profession. In case that the profession corresponds to the self-concept of the individual, he will have a high level of satisfaction with the work. On the other hand, if the work involves activities that are not in accordance with the sense of self, individual will have a low job satisfaction [30]. Choosing profession as an alternative option is problematic factor in teaching profession because indifference to nature of profession will probably be reflected in the competences, educational style of the teacher's social relations at work.

Therefore, the selection of students is essential. Intrinsic motivation and interest is essential for development of educational competencies of prospective teachers as well as strategic thinking, creative thinking and flexible thinking skills [31], [32].

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