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Professional competencies development of sports science students: the need for more entrepreneurship education

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Abstract. *As a high priority for moving the sports industry forward, the sports market ecosystem requires the development of professional competencies and improving the entrepreneurship education of sports science students. During the last years, entrepreneurship has gained importance in the sports sector to maintain competitiveness. Thus, universities need to promote sports sciences students' entrepreneurial competencies to improve employability. This research aimed to analyze the differences between first-year and fourth-year sports science students regarding the merit of professional competencies within entrepreneurship education. Both groups of students completed a set of tests presenting professional success factors. Cognitive abilities were measured with Intelligence Structure Battery (INSSV - Short Form, S2) and personality traits with Big Five Structure Inventory (BFSI, short-form, S1). Data were processed with confirmatory factor analysis and multigroup moderation analysis. The model showed acceptable fit indices (NFI=0.89, CFI=0.97, and RMSEA=0.08). The multigroup moderation analysis results indicated that the strongest effect on work aspects of the personality of the first-year sports science students comes from Conscientiousness (β=0.97), Openness (β=0.79), and Agreeableness (β=0.72). In contrast, this impact on fourth-year sports science students exists from Extraversion (β=0.85), Emotional stability (β=0.80), and Openness (β=0.80). On another side, an analysis of cognitive abilities revealed that the strongest effect was produced by numerical ability (β=0.94; β=0.84, respectively). The results demonstrated that sub-samples do not differ regarding the latent*

dimensions of human resources assessment. These results lead to necessary changes in the sports curriculum of the study program related to entrepreneurship education.

Keywords: Entrepreneurship; Curriculum; Sports Industry; Human resources; Higher Education.

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Introduction

Entrepreneurial education contributes to the academic community through students' professional competencies development and socioeconomic development, particularly in countries lacking entrepreneurial practices. Entrepreneurship education aims to change the student's mindset regarding their view of innovative and risk-taking activities in business (Jones et al., 2014). Thus, entrepreneurial education's positive effect contributes to students' progress in their creativity, multidisciplinary innovations, career development, and better business opportunities after their studies.

Entrepreneurial education is of great importance in the European Union due to the high unemployment rates of these countries (Eurostat, 2021). The main findings, according to the European Commission (EDEI, 2012, p.7) regarding higher education institutions in Europe, indicate that "entrepreneurship education has a positive impact on the entrepreneurial mindset of young people, their intentions towards entrepreneurship, employability and finally, their role in society and the economy." These and other related findings revealed that the value of education in developing the entrepreneurial potential of future graduates increasingly attracts the attention of researchers and the academia (González-Serrano et al., 2021; Gonzalez-Serrano et al., 2021; Zhou et al., 2021).

Along these lines, Paço et al., (2015) noted that it is essential that curricula provide the necessary knowledge and skills to increase employability in the labor market and help boost personal development. It is vital to have an up-to-date curriculum reflecting current societal changes and paradigms (Patesan & Bumbuc, 2010). Higher education institutions (HEIs) can offer adequate multidisciplinary innovation for responding to societal challenges (Păunescu et al., 2022). As the last link between the education system and the labor market, universities are responsible for adjusting their educational offerings to today's labor market challenges. Accordingly, some authors point out the necessity of transformation from the traditional to the entrepreneurial in terms of the mission of universities (Kuratko, 2005). This situation entails harmonizing the university's functioning with a dynamic and complex environment (Reid, 2010). As a result of these changes, the universities compete in creativity when establishing links between education and research. Etzkowitz (2013) believes that contributions can be derived for social, economic, and regional development from this synthesis of their entrepreneurial university.

These changes in the university's mission indicate that the transformation from a student to a successfully employed professional should last as short as possible in different professions while making recommendations that entrepreneurial skills and abilities develop a central place. University education is an important source of support for university

graduates to develop the necessary skills and acquire practical knowledge to become entrepreneurs. There is a need for entrepreneurial education and services of a diverse nature to meet the demands of university students who are interested in becoming entrepreneurs (Lang & Liu, 2019). The importance of employees' entrepreneurial skills was derived from the expectations of future employers, who have become aware of their great potential. That reflects the competitive advantage of organizations recognizing the importance of recruiting and retaining entrepreneurial-minded individuals (Lumpkin, 2007), thereby gaining special benefits by selecting these individuals (Leutner et al., 2014). The modern business environment exposed the need to define the desired model of entrepreneurial competence and skills of the entrepreneurs and scientists for each profession, based on professional standards (Mitchelmore & Rowley, 2010) to be acquired during the education.

Likewise, entrepreneurship is an integral part of every professional industry (Ratten, 2011), including the sports industry. Sports entrepreneurs are constantly growing, creating personal wealth and social values (González-Serrano et al., 2019; Jones et al., 2017; Ratten, 2012). Entrepreneurship in sports is vitally important to meet the changing needs of sports consumers (Ball, 2005). If competitiveness in this sector is to be maintained, entrepreneurship is vital. Sports entrepreneurship is a research field that has grown its interest over the last years (González-Serrano et al., 2020).

Moreover, sports sciences students could have developed some entrepreneurial capabilities due to the physical activity practice (González-Serrano et al., 2017). Thus, education and human resources development in this field involves constructing and strengthening many professional competencies. On the one hand, the development of human resources is determined by expertise in this field. On the other hand, the development and improvement of managerial competence related to strategic planning, budgeting, leadership (leadership) of small or large sports organizations, sporting events, marketing concept, and innovation are also deemed important. The development of all these competencies and abilities together could improve their employability.

These professional competencies are related to human resources' entrepreneurial skills in sport and their professional success rate. As pointed out by Covell et al. (2007), this is caused by the fact that regardless of their performance, sports organizations need to create a product or service that is better or different from the development of their competition. It creates constant pressure on sports managers to compete through their innovation (training-technological, informational, financial, etc.). In this vein, Ratten (2018) points out that understanding the sport's future, more attention needs to be paid to entrepreneurship, which entails improving incentives for entrepreneurship. Thus, interest in entrepreneurship education is growing amongst sports educators to improve employment outcomes (Ratten & Jones, 2018). Sports educators should adopt progressive innovation at the university level and apply it daily with students, athletes, and other clients to create and provide the best possible deals.

Empirical studies demonstrating these skills in university education are needed to understand their relevance for graduates' entry into the workforce (Martínez-Clares, & González-Lorente, 2019).

The University of Novi Sad was selected as an example of a reform-oriented university in Europe striving for an entrepreneurial university. The promotion of entrepreneurship during bachelor studies lies in many practical experiences that faculty provide to students in cooperation with organizations from the sports and leisure industry, volunteering in

sports events, and the opportunity to realize international professional practice through different European funds. Also, periodically students have an opportunity for visits, panel discussions, and a seminar where they can listen successfully stories from the sports industry, from beginning to success. This information can encourage them for similar entrepreneurial missions.

Also, deeper insight into the existing curriculum of bachelor studies of sport and physical education shows the following structure: academic-general education courses (12.35%), theoretical and methodological courses (24.30%), and scientific or artistic-professional courses (33.86%), and applied professional (29.48%). There were three courses in which the contents are linked with entrepreneurship: sociology and sociology of sport, psychology, sports psychology, and sports management.

This article, there are presented the importance of the development of professional competencies of sports science students during the bachelor with honours in sport and physical education study program. In a specific way, higher educational institutions have to find a way to offer the development of professional competencies and prepare future sports employees for conditions in the sports market. Examination of cognitive abilities and personality traits, as the main factors of professional competencies of sports science students, could provide deep insights into determinants for successful students' careers. Impact of the mentioned study program to progress the development of professional competencies of sports science students can provide quality feedback about important issues of its quality. Thus, this study could provide valuable information on how to foster entrepreneurial competencies in sports sciences students.

This study aims to analyze the development of entrepreneurial competencies (personality and cognitive abilities) related to the professional success of students in their future careers while attending Bachelor's study programs in the field of sport and physical education.

Literature review

Sports sciences graduated competencies for employability

The changes brought about by the knowledge-based economy, together with the COVID19 crisis, have made it more difficult for young people to access the labor market (Ratten, 2021). This paradigm shift has led to the fact that graduate competencies have increased attention from higher education and researchers (Pang et al., 2019). "Competency" refers to the knowledge and skills, and the characteristics as attitudes, traits, and motives (Boyatzis, 1982) that lead to superior job performance (Fleming et al., 2009). Specifically, in the sports sciences, students' importance in developing entrepreneurial skills has been highlighted in the last years (Ball, 2005; González-Serrano et al., 2017). Hence, personality traits and cognitive abilities could be a good indicator of the degree of development of the entrepreneurial skill of sports sciences students during their university training.

Personality traits and employability

Personality is a valid predictor and criterion for employees' task performance in all professions, managerial levels, and outcomes (Barrick et al., 2001; Chamorro-Premuzic & Furnham, 2010; Ones et al., 2007). Work aspects of the personality and social skills were assessed with the help of five personality dimensions of the model "Big Five," defined as

Extraversion, Neuroticism, Agreeableness, Conscientiousness, and Openness to experience (Allport & Odbert, 1936).

Extraversion is a personality trait that describes an individual's sociability, assertiveness, talkativeness, and activity (John et al., 2008). According to McCrae & Costa (2003, p. 47), this personality trait showed six facets: gregariousness, assertiveness, warmth, activity, excitement-seeking, and positive emotions. Extraversion predicts performance only in occupations where social interaction is required, while agreeableness (Salgado, 1997) and openness (Barrick & Mount, 1991) only predict competence in the subjects' training but not subsequent job performance. Therefore, in the sports domain, where social interactions are vital, extraversion may be an essential personality trait in ensuring the job performance of future sports graduates. Also, some research confirmed its significant impact on higher social status in groups and their presence in leadership positions (McCabe & Fleeson, 2012).

Neuroticism (Emotional stability) indicates the tendency to experience negative effects (e.g., fear, sadness, embarrassment, anger, etc.). Further, this personality trait is related to occupational failure and lower quality of life (Widiger & Oltmanns, 2017). Thus, it is expected that high neuroticism levels will contribute a lot to the decrease in professional performance and distraction.

Openness to experience includes imagination, sensitivity, inner feelings, intellectual curiosity, and independence when making decisions. People with high scores in this personality trait are open to new, unknown environments and activities. That behavior sometimes gives them more abilities for adaptation and more opportunities for employability and career achievement.

Conscientiousness refers to self-control and planning, organizing, and carrying out different tasks (Barrick & Mount, 1993). Higher scores in this trait (combined with Openness to experience and agreeableness) provide higher academic grade point averages (Poropat, 2009). Therefore, it can be a good opportunity to develop more professional competencies and achieve better job performance. Generally, Conscientious people are hard-working, persistent, responsible, organized, and determined.

Agreeableness is related to being altruistic and sympathetic to others. Also, a predisposition to help people and the belief that others are equal will help them. It is important to emphasize that people with low results in Agreeableness (even recognized as highly conscientious workers) showed lower job performance ratings than colleagues, which were higher results in this treatment (Witt et al., 2002).

Therefore, personality models should be the starting point for future employability research. Brandstätter (2011, p. 229) points to the enormous influence of personality on the entrepreneurial role because of its essential characteristics "to initiate a life of self-determination and independence (Neuroticism), finding new opportunities for developing the enterprise (Openness to experience), hard work and constancy in the pursuit of goals (a component of the achievement motive within the Conscientiousness), establishing a social network (Extraversion) and risk of potential failure (a combination of Neuroticism, Extraversion, and Openness)." Since the behavior occurs following the individual's personality, it is expected that there would be partial individual differences in entrepreneurship, regardless of whether that person is an owner, manager, student, or worker (Ahmetoglu et al., 2011).

When entrepreneurship is defined as business creation (status occupation), the findings indicate that entrepreneurs tend to have higher scores on Conscientiousness and

Openness and lower Neuroticism and Agreeableness than managers (Zhao & Seibert, 2006). A few years later, in a meta-analysis by Zhao et al., (2010), the personality associated with a person's predisposition or intention towards starting a business is characterized by high Conscientiousness, Openness, Extraversion, and low Neuroticism. Thus, in addition to the above findings, the importance of high levels of Extraversion was also highlighted. In this line, Antoncic et al., (2015), highlighted that Extraversion and Agreeableness might be important for entrepreneurship. Therefore, sports science students with good entrepreneurial profiles should possess high Conscientiousness, Agreeableness, Openness, and Extraversion levels, while Neuroticism should be low.

Regarding the relationship of these personality traits to job performance, Barrick, et al., (2001) noted that Conscientiousness had been associated with higher job performance in most types of work. However, these same authors pointed out that the other personality traits are more dependent on the context and characteristics of the job.

Therefore, based on these findings, it is suggested that the Big Five personality traits may help explain individual differences in entrepreneurial behaviors among sports science students. These differences can be explained not only in the intention to start a business but also in skills such as opportunity recognition, opportunity exploitation, innovation, and value creation, which can help determine the employability of sports science students (intrapreneurship) in the sports industry. Hence, they could be indicators of sports science's future employability.

Cognitive abilities and employability

On the other hand, cognitive skills have also been highlighted as vital to enhancing students' employability. Regarding cognitive abilities, over the last few years, there has been a consensus that graduates should have generic skills useful in employment. Specific skills obtained through the specific degree necessary (hard skills) can help foster employability by adding value to companies (soft skills). Green (1989) noted that employers primarily wanted graduates who demonstrated the following skills: high self-motivation and ability to motivate others, excellent communication skills, teamwork skills, managing and organizing skills, enthusiasm, and decision-making. In the 21st century, Billing (2003) highlighted the following skills as important: teamwork, self-management, creativity, problem-solving, communication skills, digital skills, and communication skills.

In a study by Horch and Schütte (2003) on the competencies of sports managers, it was highlighted that management and leadership skills, communication, social skills, and problem-solving were necessary. According to the World Economic Forum (2019), the ten most important skills in 2020 for employability are complex problem solving, critical thinking, creativity, people management, coordinating with others, emotional intelligence, service orientation, negotiation, and cognitive flexibility. In terms of the ten skills in demand by 2025 (World Economic Forum, 2020), these will be analytical thinking and innovation, active learning and learning strategies, complex problem-solving, critical thinking and analysis, creativity, originality and initiative, leadership, and social influence, technology use, monitoring and control, technology design and programming, resilience, stress tolerance and flexibility, reasoning, and problem-solving.

Therefore, it can be seen that there has been a shift in the skills and abilities most in-demand in recent years. Innovation, creativity, problem-solving and soft skills, and technological skills are capturing the attention of employers. Therefore, it seems that the

skills of sports science students related to logical reasoning are gaining importance during the last years as those of verbal ability. However, the same has not been true for numerical ability, although these may also be enablers when using technological developments.

The interrelationships of cognitive abilities and personality traits and their factor loadings can help researchers understand the main factors of human resources essential for a successful career for sports science students. Figure 1 shows the hypothetical, theoretical model on which this study is based.

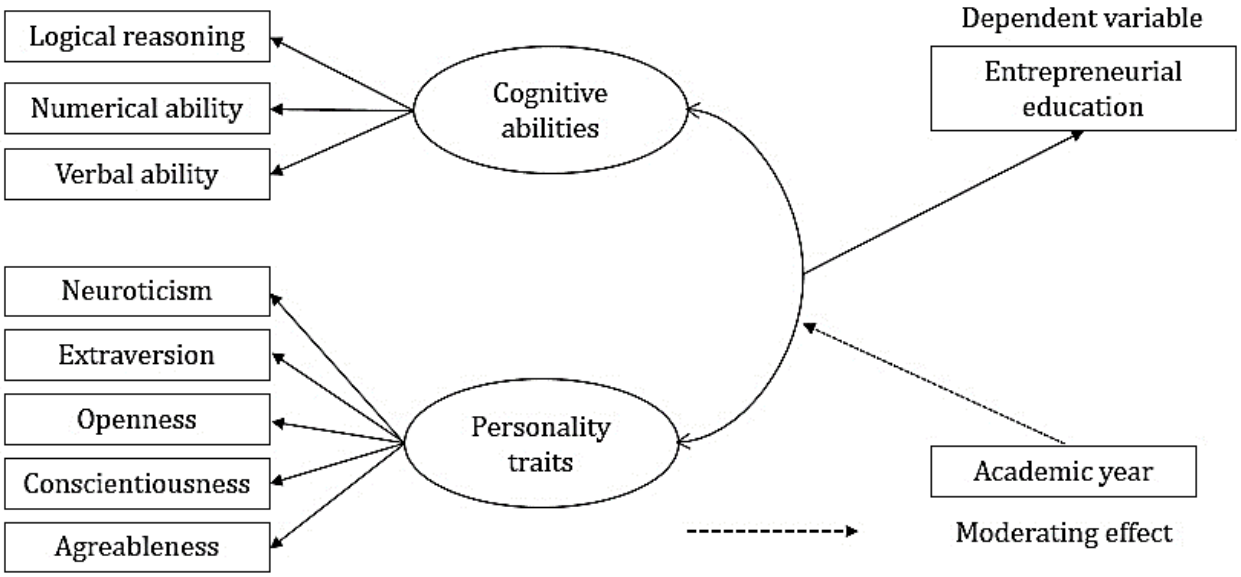


Figure 1. Proposed Hypothesized Model of main factors of human resources essential for a successful career

Source: Authors' own research.

Method

Sampling and data collection

The study provides an opportunity to acquire information about the differences between the students (N=150) of the Faculty of Sport and Physical Education, University of Novi Sad, Serbia. There were 95 males and 55 females. The respondents were divided into two subgroups of 75 students attending the first and fourth years of the degree study program for Bachelor with Honors in Sport and Physical Education. The group involving first-year students (age=19.04±0.35 years) was selected based on systematic sampling by choosing every third member from the list containing all students' names on the rank list after the entrance exam. Also, it included scores based on secondary education achievements and the aptitude test results. Based on secondary education achievements, points assigned include average scores from all four years of secondary education multiplied by two. The results of the aptitude test add up points from a) testing knowledge of the concepts from the field of sport and physical education, b) testing knowledge and skills of swimming, 3) polygon for checking versatility, 4) running 800m for the females and 1500m for the males, 5) sports games polygon, 6) tests for checking the sense of rhythm and movement and artistic gymnastics. Data collection was carried out from students who studied in the academic year 2017/2018 in Novi Sad, Serbia.

The fourth-year sports science students (age=22.60±1.85 years) were formed based on a systematic counting where every third member was chosen from the ranking list of students who enrolled this year of study in the same school year.

The collecting data was realized in two phases: 1) participants signed written consent, and 2) the testing at a psychological laboratory at the Faculty of Sport and Physical Education, University of Novi Sad. All testing was conducted by logging on Vienna Test System (VTS, Schufried GmbH, Austria); a digital solution for psychological assessment is a state-of-art technology to measure psychomotor skills. This tool for evaluating the job's main success factors for different professions was adopted and used to assess human resources. The same set of tests, the main factors of Human Resources (KEYHR), were applied for both subsamples of students.

The study was approved by the Ethics Committee of Sport and Physical Education, University of Novi Sad, Serbia. All participants were treated under the ethical guidelines of the American Psychological Association.

Measures

The selection of dimensions for evaluating occupational performance in this study is based on current intelligence (Carroll, 1993; Horn, 1989; Schneider & McGrew, 2012) and personality research models (Arendasy, 2009). Factors of professional performance were divided into two general categories of working aspects: 1) *Cognitive abilities* (that are associated with their execution), and 2) *Personality traits* (that have the greatest impact on the way of performing everyday tasks).

Cognitive abilities

Cognitive abilities were assessed by three subtests of the *Intelligence Structure Battery* ((INSSV - Short Form, S2, by Arendasy et al., 2012). The definition of cognitive abilities is based on the CHC model of Cattell-Horn-Carroll hierarchical intelligence (Horn, 1989; Carroll, 1993; Horn & Noll, 1997). Three key factors of the CHC model were selected that are of particular interest for practical applications in HR: 1) logical reasoning, 2) numerical, and 3) verbal abilities.

- *Logical reasoning:* An additional test for the Figural Inductive Reasoning subtest measures logical reasoning (fluid intelligence, analytical thinking). This test included a 3 x 3 matrix on which 8 of the nine fields contain figures arranged according to various rules. The candidate must recognize these rules and apply them to fill in the blank ninth field. The testing of logical reasoning is limited in time to 15 minutes. Higher scoring of individuals in this ability means that person is better at acquiring new knowledge and its application into everyday routines.
- *Numerical ability:* Numerical ability is a person's ability to understand basic mathematical principles and apply them to solve practical problems assessed by an additional Arithmetic flexibility test. A high score on this test showed that an individual has a well-known functional possibility of using basic arithmetic operations. These abilities are recognized as skills that help work on everyday professional routine tasks in the work environment. The short form of this set of questions lasts 15 minutes.
- *Verbal ability:* Verbal abilities (a person's crystallized intelligence) represent all knowledge acquired during life or determined by the environment, assessed by additional meanings of words test. The Word meaning subtests assessed it. Therefore, these abilities

contain an individual's vocabulary and ability to extract the knowledge for solving the problem from memory (for example, the candidate has a series of expressions, and he should choose the most similar expression in meaning among the four offered options. The time is limited to 10 minutes.

Big five personality traits

This psychological personality model postulates five principal personality dimensions that are key non-job-specific factors of occupational success. The predictive power of the tests in the test set concerning occupational success has been demonstrated in validation studies. The participants responded to *Big Five Structure Inventory* (BFSI, S1) proposed by Arendasy (2009) on 100 items. Participants must select which is appropriate for personality description based on short descriptive words or phrases related to personality traits. This approach is very useful, based on previous problems with longer phrases and sentences (McCrae et al., 2005). All responses were responded on the 4-point Likert rating scale (from untypical for me (1) to typical for me (4). We found suitable application of the Likert scales from 4 points with intention to receive concrete and specific responses from participants. Therefore, personality traits were tested with five dimensions (Neuroticism, Extraversion, Conscientiousness, Openness, and Agreeableness). These dimensions have two subscales, and a set of tests are shown in Table 1.

Table 1. Dimensions and tests of Cognitive Abilities and Personality Traits

Dimensions	**Form**	**Test**	**Test form/ Subtest**	**Time (minutes)**
Cognitive abilities				
Logical reasoning	Short	INSSV	S2	15
Numerical ability	Short	INSSV	S2	15
Verbal ability	Short	INSSV	S2	10
Personality traits				
Neuroticism	Short	BFSI	S1/ Social confidence, Emotional robustness	2
Extraversion	Short	BFSI	S1/Sociability, Assertiveness	2
Conscientiousness	Short	BFSI	S1/ Sense of duty, Ambition	2
Openness	Short	BFSI	S1/ Openness to actions, openness to ideas	2
Agreeableness	Short	BFSI	S/1 Genuineness, Willingness to help	2
Total length				**50**

Source: Authors' own research.

The standard report compares every participant on each Big Five dimension to the norm group using a percentile scale. This report is based on a unidimensional item-response model for the rating scale of ordinal data with conformity to the partial credit model (PCM) (Masters, 1982). The PCM assumes probability for one item is a person parameter explained as a function of an individual's values on the latent variable and threshold. The application of

PCM allowed comparisons among persons and item scores (Masters, 1982). We used the person parameter instead of the overall sum scores.

The application of the model selected in the study is based on frequent application in many studies of entrepreneurial orientation and a meta-analysis of the personal aspects of entrepreneurship in two decades conducted by Brandstätter (2011).

Data analysis

Statistical analysis included a four-step approach: [1] Descriptive statistics, [2] Cohen's d as appropriate analysis of effect size for the comparison between two means, [3] Confirmatory analysis (CFA) of the key constructs, and [4] Test of invariance and multigroup moderation test with critical rations.

Configural and metric invariance were applied as an important step before latent mean comparison and the multigroup moderation test, with the main intention to assess the same measurement properties of the instrument in two subsamples. For examination of configural invariance was ran AMOS Graphics, following the recommendations by Byrne (2004), while metric invariance was calculated with the Stats Tool Package (Gaskin, 2012). As proposed recommendations (Hu and Bentler, 1999), the test of the model was based on the evaluation of several goodnesses of fit indices: Root Mean Square Error of Approximation (RMSEA), the Bentler Comparative Fit Index (CFI), and Non-Normed Fit Index (NNFI). The constructs mentioned above of personality traits and cognitive abilities were tested using Cronbach alpha to measure internal consistency.

The comparison of the subsamples was made using a multigroup moderation test with critical ratios (Lowry & Gaskin, 2014) using the Stats Tool Package (Gaskin, 2012). This approach requires the calculation of group differences based on the path differences of both groups, considering their critical ratios. This method is selected to test whether the model fits both groups of sports science students equally. Also, this method contained the z-score and estimated regression weights for calculating the group differences in the model. All analyses were run with IBM SPSS, AMOS 26.0.

Results

Descriptive characteristics of respondents

The results of descriptive statistics (Means, Standard Deviations), Cronbach's Alpha and Correlations of the Cognitive abilities and Personality traits for both groups of students was showed in Table 2. For a group of first year of students, the mean scores of parameters of Personality traits were *Neuroticism* (M=0.23; SD=0.51), *Extraversion* (M=0.49; SD=0.64), *Openness* (M=0.31; SD=0.64), *Conscientiousness* (M = 0.23; SD=0.66), and *Agreeableness* (M=0.74; SD=0.84). The students from fourth year of studies achieved the next mean scores *Neuroticism* (M=0.52; SD=0.52), *Extraversion* (M=0.45; SD=0.80), *Openness* (M=0.32; SD=0.94), *Conscientiousness* (0.29; SD=0.78), and *Agreeableness* (M=0.85; SD=0.75). Also, the means scores of *Cognitive abilities* for students of 1st year were *Logical reasoning* (M=0.35; SD=0.97), *Verbal ability* (M=0.08; SD=0.65), *Numerical ability* (M= -0.26; SD=1.38), while for students of 4th year were *Logical reasoning* (M= -0.12; SD= 0.92), *Verbal ability* (M=0.41; SD=0.77), *Numerical ability* (M=-0.03; SD=1.67). There are no correlations between dimensions of *Personality traits* and *Cognitive abilities*, while interitem correlations exist in both dimensions.

Cohen's d test

The potential differences to discover potential statistical significance among variables of both student groups were calculated using Cohen's d test. The means treated with Cohen's d test (Table 2) showed statistical differences in emotional stability among sports science students, where students in the 4th year have statistically higher scores in this trait. Also, the statistical difference in verbal ability in favor of 4th-year students can be noted, but from another statistical difference in logical reasoning in favor of 1st-year students.

Table 2. Means (M), Standard Deviations (SD), Cronbach's Alpha, and Correlations for Personality Traits and Cognitive Abilities

		1st year M ± SD	**4th year M ± SD**	**α**	**r**						
		Parameter	Parameter		1	2	3	4	5	6	7
1.	Neuroticism	0.23±0.51	0.52±0.52[b]	0.83							
2.	Extraversion	0.49±0.64	0.45±0.80	0.83	0.62**						
3.	Openness	0.31±0.64	0.32±0.94	0.93	0.50**	0.57**					
4.	Conscientiousness	0.23±0.66	0.29±0.78	0.90	0.58**	0.52**	0.73**				
5.	Agreeableness	0.74±0.84	0.85±0.75	0.83	0.38**	0.24	0.36**	0.54**			
6.	Logical reasoning	0.35±0.97[b]	-0.12±0.92	0.78	0.04	0.24	0.09	0.06	0.04		
7.	Verbal ability	0.08±0.65	0.41±0.77[b]	0.74	0.03	-0.12	-0.17	0.02	0.10	0.05	
8.	Numerical ability	-0.26±1.38	-0.03±1.67	0.91	0.13	0.00	-0.13	0.06	0.01	0.30*	0.43**

Note: M – Mean, SD – Standard Deviation, Parameter - Cognitive abilities and Personality traits measures reflect person parameters according to the RASCH model.
* p<0.05, ** p<0.01
Cohen's d effect sizes tests: [a] - small (0.20), [b] - medium (0.50), and [c] – large 0.80.

Source: Authors' own research.

Confirmatory analysis (CFA) of the key constructs

Assessment of the adequacy of the applied theoretical model using the path analysis provided the following results: Chi-square χ^2 = 13.10 (df=10), χ^2/df = 1.31, with the following indicators of fit model NFI=0.89, CFI=0.97, and RMSEA=0.08. Thus, values of NFI and CFI fit indices contributed to the excellent fitting of the model (Hu & Bentler, 1999), which values of RMSEA, according to MacCallum et al. (1996), show reasonable moderate fitting. The results of factor loadings in all variables showed higher values than the criteria of 0.40 (Kaiser, 1974), which means that the proposed model fits the empirical data well. Also, the low value of the correlation coefficient between Personality traits and Cognitive abilities showed no statistically significant correlation among these factors for both subsamples.

The results of internal consistency were acceptable according to values of Cronbach alpha which are shown in Table 2 (α >0.74), proposed by Nunnally and Bernestein (1994).

Test invariance and multigroup moderation test

In the next step of statistical analysis, before the multigroup moderation test, model invariance was tested using the Chi-square test previously. Results of this procedure (p=0.44, greater than 0.05) showed no difference in the factor structure of constructs concerning academic year (among 1st and 4th-year students). This finding of invariance means that all criteria are satisfied, allowing comparisons across student groups. That comparison consists of the multigroup moderation test indicating the impact of belonging to one or the other subsample of subjects on the impact of variables on students' personality traits and cognitive abilities.

Table 3. Multi-group Moderation Test, Standardized Path Estimates, Z-scores among the sports science students of the 1st year and 4th year of studies (N=150)

			1st year	4th year	z	p
Variable			**β**	**β**		
Agreeableness	<---	Personality traits	0.72	0.29	1.12	N.S
Conscientiousness	<---	Personality traits	0.97	0.74	0.81	N.S
Openness	<---	Personality traits	0.79	0.80	1.03	N.S
Extraversion	<---	Personality traits	0.52	0.85	1.13	NS.
Neuroticism	<---	Personality traits	0.65	0.80	0.97	NS.
Logical reasoning	<---	Cognitive abilities	0.35	0.29	0.31	NS.
Verbal ability	<---	Cognitive abilities	0.37	0.44	0.45	NS.
Numerical ability	<---	Cognitive abilities	0.94	0.84	0.09	NS.

Note: β = standardized path of coefficients, NS. – nonsignificant.

Source: Authors' own research.

It is visible that the strongest effect on work aspects of the personality of the first-year students comes from Conscientiousness (β=0.97). In contrast, it comes from Extraversion (β=0.85). When it comes to cognitive abilities, the strongest effect was produced by the numerical ability for both subsamples (students of the first year: β=0.94; students of the fourth year β=0.84). This analysis revealed (based on their z-scores) that the subsamples did not differ in their impact and causal connections with latent dimensions (work aspects of personality and cognitive abilities).

After a careful analysis of Figure 2 with the results of both subsamples, it is evident that the fourth-year students achieved greater values for estimates than the first-year students in *Neuroticism, Extraversion, and Openness*. On another side, in the 1st year of sports science, students achieved higher values in *Conscientiousness, Openness, and Agreeableness*. However, these differences were not statistically significant (p<.05).

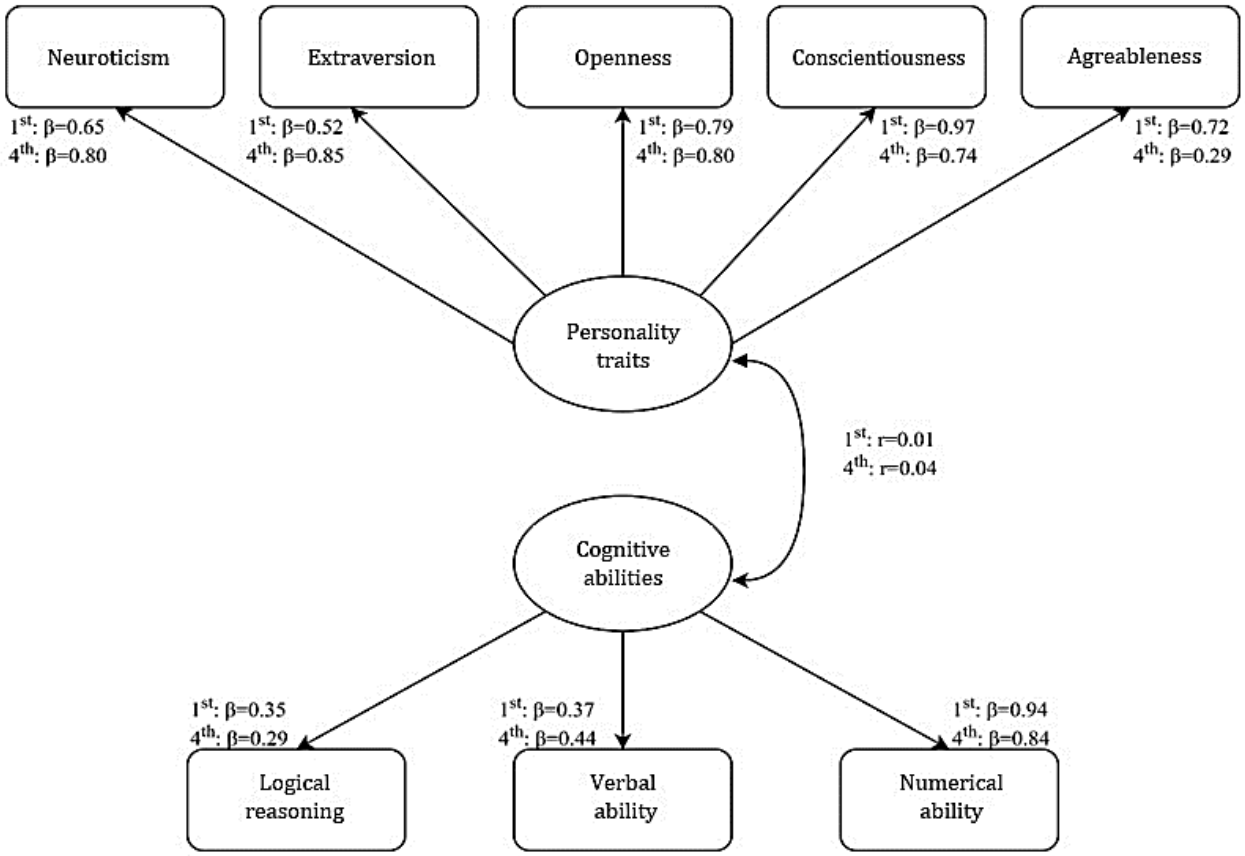


Figure 2. The results of the Proposed Hypothesized Model of Personality Traits and Cognitive Abilities

Source: Authors' own research.

Note: 1st – sports science students of 1st year, 4th – sports science students of 4th year, β = standardized path of coefficients.

Discussion and implications

Entrepreneurial education, as a complementary area in the development of future experts in the field of sport and physical education, provides a chance for a more comprehensive understanding of the study and the acquisition of professional competencies in the broader context of finding a place and role for the individual in the overall sport and leisure industry. This study provides information about how these students are market-oriented and oriented by the higher education institutions with the knowledge provided for the selected study program. Ensuring that university sports education meets the needs of the sports industry is vital to improving the employability of sports sciences graduates.

Although no statistically significant differences between the subsamples were obtained, the findings of this study show that the evaluation of work aspects of the personality of the fourth-year students compared to the first-year students is, to a greater extent, based on extraversion of emotional stability.

Thus, the sports sciences bachelor's degree in Serbia also enhances the professional and entrepreneurial profile and employability of sports sciences students by enhancing Neuroticism and Extraversion. Extraversion and Neuroticism greatly affect personality traits in 4th-year students than in 1st-year students. It probably happens because the practical subjects, especially team sports (basketball, football, volleyball, handball, etc.) of the

Bachelor's degree, help students improve these traits. Also, working in groups on the different subjects and presentations during the studying process contributes a lot.

Considering these findings obtained by other authors examining the structure of relations between the dimensions of professional interests and personality tests, some indirect progress in the subsample of fourth-year students can be observed. Hedrih (2007) suggests that Extraversion has achieved a significant correlation with the social and entrepreneurial interests of subjects, Judge et al. (2002) with job satisfaction, and Prpa (2017) with self-handicapping strategies and with entrepreneurship (Antoncic et al., 2015; Zhao et al., 2010). These findings leave the possibility of assuming that the fourth-year students were slightly ahead compared to the first-year students.

However, the connection between extraversion and entrepreneurship should be cautioned, as Zhao and Seibert (2006) indicated. They state that there was no difference in the dimension of Extraversion between entrepreneurs and managers. Also, the same authors found statistically significant differences in favor of entrepreneurs and the four dimensions of personality (higher scores within the dimensions of Conscientiousness and Openness to Experience, and lower scores for the Neuroticism and Agreeableness), and Conscientiousness on job performance (Barrick & Mount, 1991). Similar results mentioned by Judge et al. (1999), in context relations between "Big Five" personality traits, examined that Conscientiousness is related to successfully positively intrinsic and extrinsic career success and neuroticism negatively predicted extrinsic career success.

On the other hand, Conscientiousness and Agreeableness have a stronger effect on the 1st year students. This finding may be due to the high motivation of students, commitment to studies, and focus at the beginning of the study process to achieve higher academic grade point averages and better competencies. At the same time, a similar effect of Openness on 1st and four-year students revealed that this treatment is equally important in the whole studying process in sports sciences. Thus, as Conscientiousness is the most influential work aspect of the personality of the first-year students, it seems that they have an initial positive predisposition to job performance. It may be because physical activity practice could have improved their persistence, responsibility, and capacity for planning and organizing. However, these findings positively promote employability, as several studies have highlighted employers' demand for soft skills in recent years (Deming & Kahn, 2018; Staboulis & Lazaridou, 2020).

The strongest effect was produced by numerical ability in both first and last-year students regarding cognitive abilities. However, employers are not demanding this ability in the last years. In contrast, innovation, creativity, problem-solving and soft skills, and technological skills are highly demanded abilities by employers (World Economic Forum, 2019, 2020). These skills relate to logical reasoning and communication (Billing, 2003; Green, 1989; Horch & Schütte, 2003).

One positive finding is that verbal ability greatly influenced the final year of sports sciences students more than first-year students. However, this effect is not statistically significant in multigroup moderation analysis. Still, Cohen's d test showed higher verbal abilities of 4th-year students could be considered a contribution to the Bachelor's study program and improve the future entrepreneurial potential of sports science students. This finding aligns with Hartog et al., (2010). They showed the impact of verbal and clerical abilities on wages and pointed out the values of mathematical, social, and technical skills for entrepreneurs. Further, it confirmed Lazear's Jack-of-all-Trades theory, where

entrepreneurs should possess many competencies in many fields defined in The European Entrepreneurship Competence Framework (Bacigalupo et al., 2016).

Moreover, the cognitive competencies of reasoning and verbal skills must be worked on in a transversal way to prepare students for their future employment and improve their employability. To this end, both theoretical and practical subjects (basketball, handball, football, etc.) can be a good opportunity to develop both personality traits and cognitive skills. The use of new and more active methodologies is needed (Lean Canvas, cooperative learning, new technologies, portfolio, etc.). Thus, logical reasoning and verbal abilities need to increase higher during studying. Secondly, improving conditions and creating a more favorable learning environment for the students using all contextual factors that explain the entrepreneurial intentions of students are required.

Hence, considering the findings of this research, the current curriculum at the Faculty of Sport and Physical Education at the University of Novi Sad seems not to be preparing appropriate sports sciences students for the labor market. It may be because it contains 50 subjects, and there is an insufficient (only 6%) number of subjects that directly or indirectly orientates the students toward developing entrepreneurial competencies. The program of study structured in this way certainly meets its primary target: the production of highly educated human resources for sports and school physical education. However, in line with the findings of this research, it is also clear that the entrepreneurial spirit in students is not being developed sufficiently. This finding is in line with Ansari and Husen (2015), who pointed out that there have been fewer entrepreneurs than intended despite the opportunities presented by the sports sector. Similar results of the underrepresentation of sports economics in sports management curricula were reported by Humphreys and Maxcy (2007). They interpreted it as non-qualification in the given field because of the indifferent attitude of these institutions, which these authors justify by the fact that entrepreneurship is relatively new in the area of sport.

Similar proposals are mentioned by Nova (2015). She highlights the urgent need to create a conceptual framework for addressing the need to develop entrepreneurial competencies in the study of sports management. She suggests introducing new teaching and learning strategies among sports management students to strengthen their entrepreneurial skills (study curricula, extracurricular activities, and support for university start-up projects for students and graduates). Therefore, there is some consideration of the circumstances needed for finding various methods for college and university students' initiatives to provide help and support to launch different projects, ideas, and suggestions.

Universities should manage employability through actions to foster employability skills, promote cooperative learning, improve the university-work relationship, access employment opportunities and internships, and form a long-term career goal (Martínez-Clares, & González-Lorente, 2019).

Considering the sports science students, it may be necessary to become familiar with all the facts that determine success by thoroughly analyzing all the factors in the external and internal environment during the realization of potential business plans in the future area. At the same time, either through formal or informal education, there is a need to analyze national and international examples of good and bad business practices in this area. Using this type of approach, where creative and entrepreneurial skills are included in the teaching methodology within the education and training systems, would better affect entrepreneurship's "artistic" side (World Bank, 2014). In addition, Akola and Heinonen

(2006) point out that the "artistic" part of entrepreneurship is most appropriately conveyed through practical experience or experimental learning (Fenton & Barry, 2011), while the business and management skills are adopted through the scientific approach.

Consistent with these results, Patesan and Bumbuc (2010) suggest that the curriculum must be aligned to its role in preparing professionals who need to ensure further progress. These changes primarily involve promoting courses associated with developing students' entrepreneurial skills in curricula of study programs, following the key principles of the Bologna Process expressed in a Six-step model (AEHESIS, 2006). Also, these changes are based on the theory of planned behavior (Ajzen, 1991) and intervention to change the behavior of students based on different predictors. Therefore, professional competencies development should ensure their better market position. Relevant to the above results, Ge (2011) emphasizes the importance of innovating physical education and entrepreneurship, designing new instruction models, and teaching them. The need to improve innovation and entrepreneurship education in the sports system education is also emphasized, as the findings of this research highlight.

These are the factors that enable individuals to have the opportunity to receive valid information on entrepreneurial opportunities during the process of growing from various entities (teachers, parents, mentors, and role models) (Van Auken et al., 2006a; Van Auken et al. 2006b). With this in mind, the effect of other factors should be considered, such as personality traits (risk, creativity, need for achievement), formal education and entrepreneurship knowledge (experience, knowledge, awareness), demographic characteristics (gender and age) (Teixeira & Davey, 2010). The change of the contents and methodologies in the Bachelor's degree in Physical Education and Sport is needed to enhance sports sciences employability.

Overall, there is no research assessing the professional competencies of sports science students in Serbia. This research has the intention to launch the topic with a focus on twofold suggestive directions: 1) deep insights into the explanation of professional competencies development of sports science students, 2) better consideration of the potential for improving the study program of sports science students.

Lastly, practical implications of findings are important from the aspect of contribution and process of shift from starting point to a better position in achieving a creative and supportive environment for improving entrepreneurship education. Monitoring of parameters of students' progress in professional competencies should be set in a more important place during the study in Serbia and widely.

Conclusion and future research

Conclusions

Consequently, by further analyzing program objectives in the curriculum, it is clear that the curriculum could be more oriented towards introducing students to the role and skills of entrepreneurs and intrapreneurs, with due consideration of ways to support faculties and universities in developing the best business ideas of students. The current objectives of the analyzed curriculum are only partially dedicated to achieving entrepreneurial skills, stressing the necessity for students to adopt high professional standards aimed at improving their professional work, monitoring information resources important for further professional development, and designing adequate movement programs for different populations.

Based on the results obtained, it is recommended that the existing generic (general) competencies of students being developed during the study programs be upgraded to comply with the requirements of their future employers (school, sports, organization, fitness center, etc.). Furthermore, regarding the existing market saturation at said employers, future sports educators should be 'encouraged' to create and develop their working environment, with the help of entrepreneurial knowledge and skills acquired during their studies, to acquire their niche more easily in the sport, physical education, and recreation market. According to Shi et al. (2011), this goal involves transforming the original ideas of physical education students to offer skills ready for the market. The greatest challenge faced on this path is how to apply creativity, innovation, and initiative in various activities, whereby a way is found to turn the strategy into a successful result.

The findings of this study bring to the fore the necessity to make changes in the curriculum of the study program for the Bachelor's degree in Physical Education and Sport in Serbia. Developing skills and abilities related to entrepreneurship is vital in the sports sector. The degree in Physical Activity and Sport Sciences is a good scenario for training the future sports entrepreneurs and intrapreneurs that the sector demands. Training during the Physical Activity and Sport Sciences degree must improve Agreeableness, Conscientiousness, Openness, and Extraversion and reduce Neuroticism levels.

Limitations of the study and future research

Some limitations should be mentioned in the context of this research. This research is based on a transversal research design. More specific and quality information could be collected from longitudinal research design, where the same group of students will be monitored throughout the studying process a few years later. This type of research process would involve monitoring the development of the professional competencies of a group of students throughout the study in the context of their professional performance. In that vein, as very important, it is imposed to monitor the period after the completion of studies and establish their work engagement by supervising their actual business achievements and success. This research can be a good starting point for future research from that aspect.

Also, future research should include academic staff as participants, which could provide additional information about staff perceptions about entrepreneurial education and students' employability. Testing the differences in students and staff's perspectives should provide a broader perspective on developing professional competencies in sports studies.
Further, it can be useful to expand the proposed research model using the concept of student engagement and constructs of cognitive, behavioral, and emotional aspects of students' involvement in employability.

Lastly, future directions should test the impact of different entrepreneurial training on developing professional competencies during bachelor studies of sports science students. However, this research with good consequences in two parallel fields: understanding of the professional competencies development of sports science students would be expanded. In terms of entrepreneurial education, it could improve some changes in sports science students' entrepreneurial education at this university.

CRediT authorship contribution statement

Radenko M. Matić: Conceptualization, Methodology, Data collection, Formal analysis, writing – original draft, writing. *María Huertas Gonzalez-Serrano*: Formal analysis, writing,

manuscript editing. *Jelena Damnjanović*: contributed to analyzing data and reviewing the manuscript. *Branka Maksimović*: collected data and approved the final version of the manuscript. *Nataša Papić-Blagojević*: contributed to analyzing data and reviewing the manuscript. *Isidora Milošević*: collected data and approved the final version of the manuscript. *Jovan Vuković*: collected data and approved the final version of the manuscript.

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