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# EXPLORING SOCCER COACHING **COMPETENCIES:** DESIGN AND VALIDATION OF A MEASUREMENT INSTRUMENT

Original research

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#### **ABSTRACT**

Methods: A experimental study involved the participation of 207 soccer coaches (B, A and PRO UEFA coaching license). The subscale of the questionnaire refers to coaching and leadership competencies, contains 47 items and was created from the existing questionnaires. Responses to the items of the third subscale are also given in the form of a five-point Likert scale, where respondents were required to indicate the level of agreement with the given statements. The questionnaire examines coaching and leadership competencies contained in 6 groups of competencies. Each competency (communication competencies. football and other competencies, organizational competencies, leadership competencies, technical and motivational competencies, training technology competencies - performance monitoring and training/match analysis) consists of 7 or 8 items. The validation of the developed instrument in this empirical study was conducted using two procedures: (1) factor analysis (PCA with oblique rotation) and (2) an internal consistency assessment (Scale Reliability Analysis – Cronbach's Alpha).

**Results:** By applying principal component factor analysis to the data of the "coaching and leadership competencies" subscale with oblimin factor rotation, 7 significant factors with a Kaiser value greater than 1 and 64.671% of the total variance were identified.

**Conclusions:** The non-objectivity of the respondents was established by applying a self-evaluation scale, and it was confirmed that such questionnaires cannot be used to assess the accuracy of an individual's assessment. It is noticeable that the general opinion of coaches about the importance of certain competencies is probably wrong.

**Keywords:** football, competencies, style, coaching, leadership, UEFA

## INTRODUCTION

present activities in the lives of many people, both as a spectator and as a consumer, especially among the male population. In many top sports, including football, managers perform functions that are crucial for organizations (Wagner, S., 2010), while the role of manager/coach itself represents a stressful and turbulent public position responsible for team performance (Crust, L., & Lawrence, I., 2006).

Football is inevitably one of the most People who are not prominent in this game, but are crucial for sports results, are football coaches. They represent central figures who are positioned between athletes and organizational goals (Louis, D., & Fatien Diochon, P., 2014). Coaches are defined as people who lead athletes in their competitions, prepare athletes and the competition, and ultimately manage the sport (Ataçocuğu, M. Ş., & Yorulmazlar, M. M., 2017). The goal of a successful and effective

coaching career is, without a doubt, the ability to select, retain and develop the best athletes, which is ultimately the key to survival in the role. The coachathlete relationship is the heart of coaching, where the interaction between coach and athlete generates learning and progress for the athlete, which leads to better results (Moen, F., & Federici, R. A., 2013; Silva, J. E. C. Q. D., Vieira, L. S. G., & Gomes, A. I. C. D. S., 2016).

The specificity of this profession is that positions are very unstable, where changes are something that inevitably comes, especially after poor results. The possibility of changing coaches during the season depends on team performance, measured by two performance indicators within the season: cumulative points in the previous four matches and "cumulative surprise" - an indicator that measures the deviation between the current and expected results based on betting odds (Van Ours, J. C., & Van Tuijl, M. A., 2016). Previous research indicates positive financial effects for the organization when changing managers, while the effects on sports results caused by such changes are diverse (Wagner, S., 2010).

A good coach must inevitably have good interpersonal relationships in order to be able to establish good team cohesion. Experience has a significant impact on establishing good interpersonal relationships, which are very important for a good team climate, because an experienced coach instills trust, better understands the behavior of athletes, and recognizes the skills needed to perform specific tasks on the basis of which he includes athletes in the team (Bykova, A., & Coates, D., 2020).

In the work of Abd Karim (2016) describes the role of the coach as an artist, educator, leader, motivator, planner, negotiator, manager, and listener, while teaching involves the interaction of three fundamental variables: the coach, the athlete, and the environment. The behavior of the leader/coach is crucial in increasing or decreasing player morale and team performance (Chen, C. C., 2013).

The objective of this study was to construct and validate a questionnaire designed to ascertain the characteristics of UEFA soccer coaching competences.

#### Coaching and leadership competencies

Competencies represent the integration of knowledge, abilities, skills and attitudes that enable good individual performance, and can be defined as the basic characteristics of an individual that are causally related to a reference criterion and/or top performance in a job or a given situation (Sydänmaanlakka, P., 2003). They are manifested through concrete actions, in the ability to act effectively in a particular situation. Coach

competencies can be defined as "tools" that coaches use to achieve goals (Wise, D., & Hammack, M., 2011). Drejer, A. (2001) states that competencies represent the integration of four elements and their relationships: technology, people, organizational structure and organizational culture. Knowledge is a highly valued state in which a person is in cognitive contact with reality (Zagzebski, L., 2017). Knowledge can be defined as a property of the human mind (Hicks, R. C., Galup, S. D., & Dattero, R., 2004), or as the ability of people to use information to solve complex problems and adapt to change (Pezer, M., 2020).

The skill is the rapid and accurate execution of a complex sequence of learned actions (Petz., 2012). Ability represents the implementation of competencies in practice (Sydänmaanlakka, P. 2003). The ability to apply what has been learned in practice represents the possession of a certain competence that is the result of the learning process.

Attitude can be defined as a mental filter through which one experiences the world (Keller, J., 2020). It is a relatively stable and enduring predisposition to behave or react in a characteristic way (Altmann, T. K., 2008). The aim of this research is to identify profiles of UEFA football coaches based on coaches' competencies, as well as to identify differences in competencies of UEFA football coaches at different levels.

#### **METHODS**

#### **Participants**

The sample of respondents in this study was stratified from the population of football coaches who hold a B, A or PRO UEFA coaching license obtained in Bosnia and Herzegovina (n=207; M=196; 95%; F=11; 5%). The first subsample consists of coaches with a UEFA B license (n=86; 41%), the second subsample with an A license (n=97; 47%) and the third subsample with a PRO license (n=24; 12%).

#### **Procedure**

The subscale of the questionnaire refers to coaching and leadership competencies, contains 47 items and was created from the existing questionnaires Measuring and evaluating coaching performance using a 360° feedback process by York, R., developed in 2015, and the football coaching process - FFA coaching expertise model by Kelly C., developed in 2013. Responses to the items of the third subscale are given in the form of a five-point Likert scale, where respondents were required to indicate the level of with agreement the statements given. questionnaire examines coaching and leadership competencies contained in 6 groups of competencies.

Each competency (communication competencies, football and other competencies, organizational competencies, leadership competencies, technical and motivational competencies, training technology competencies - performance monitoring and analysis of training/matches) consists of 7 or 8 items.

### Statistical analysis

The data were operationalized using adequate mathematical and statistical methods with the aim of testing the hypotheses set in the paper, using the IBM SPSS Statistics 25 software. In the first step, basic measures of descriptive parameters were created (which include: measures of central tendency (arithmetic mean, mode, median), measures of variability and dispersive parameters (standard deviation, variance, minimum, maximum, range) and measures of the shape of the distribution of results (skewness and kurtosis). The normality of the data distribution was checked using the Kolmogorov-Smirnov test (KS test) with an error of 5%. The reliability of the measuring instrument was assessed by the Krobach  $\alpha$  coefficient (internal consistency check - Scale Reliability Analysis), with the factor significance threshold set at the  $\alpha = 0.80$  level. Up to the number and the structure of factors that determine UEFA football coaches of different levels was obtained by applying the multivariate statistical procedure exploratory factor analysis, the PCA (Principal Components Analysis) method. The level of statistical inference was set at a significance level of 0.05 (p < 0.05). To reject low-informative variables, the Guttman-Kaiser criterion was used, according to which only those variables with corresponding eigenvalues greater than 1 are taken with oblimin (oblique) factor rotation, where average communality values less than 0.5 indicate the unsuitability of the correlation matrix for factor analysis, i.e. average communality values of 0.6 are recommended as the lowest acceptable amount (Fazlić, S., & S., Đonlagić., 2016.; Hill, B. D., 2011.). Given that the obtained data were normally distributed, the determination of the statistical significance of the differences between the groups of football coaches (B, A and PRO) was assessed by univariate analysis of variance (ANOVA). Given that the null hypothesis was rejected and that the results of ANOVA showed statistical significance of the differences between the groups, the post-hoc LSD method was applied to determine in which variables the groups statistically differed.

# **RESULTS**

Since it was not possible to find an existing questionnaire that would meet the needs of research and identify the competencies characteristic of football

coaches, a multi-item scale was created that aims to identify the competencies of this specific group of respondents. The metric characteristics of the created measuring instrument in this empirical study were verified through two procedures: (1) factor analysis (PCA approach with the oblique projection method) and (2) checking internal consistency (Scale Reliability Analysis) based on the Cronbach Alpha coefficient. The choice of the aforementioned statistical procedures was conditioned by the nature of the research and the specific research instrument. This is a pioneering modified instrument that has not been used in any previous study.

The first step in verifying the metric characteristics of the survey questionnaire is to use the statistical procedure factor analysis, the principal components analysis (PCA) method, with the aim of verifying the validity of the questionnaire: (1) a forty-seven-item scale relating to coaching and leadership competencies.

In order to reduce the number of variables, or dimensions of space, and according to general research recommendations for testing instruments in the form of a questionnaire or scale (Srdić, V., Nešić, M., & Jakupović, S.,2019, according to Pallant, J., 2009), the Kaiser-Mayer-Olkin measure of sampling (KMO test) criterion was used to reject variables that carry an insufficient amount of information (Table 1).

Table 1. Kaiser Mayer-Olkin and Bartlett test - PCA Factor analysis with Oblimin rotation - coaching and leadership competencies

Description	Value				
KMO sample ade	0.958				
Bartlett's test of	Approx. Chi-Square	7388.196 1128			
sphericity	df				
	Sig.	0.000			

By applying principal component factor analysis to the data of the "coaching and leadership competencies" subscale with oblimin factor rotation, 7 significant factors with a Kaiser value greater than 1 and 64.671% of the total variance were identified (Table 2). The eigenvalues are 23.112 (first factor), 1.874 (second factor), 1.432 (third factor), 1.268 (fourth factor), 1.190 (fifth factor), 1.138 (sixth factor) and 1.028 (seventh factor). All seven of the above factors have critical values greater than 1. The percentage of total variance for the respective factors is greater than 0.60, or 60%, which means that the lower permissible limit for social character research has been exceeded (Fazlić, S. et al., 2016).

Looking at the matrix of the structure, in the subscale relating to coaching and leadership competencies

Table 2. Matrix of factor structure, eigenvalues and explained variance - results of extracted factors - Oblimin rotation (Coaching and leadership competencies

	li	nitial value	ng.	Extracted sums of squared loadings								
Factor	Eigenvalues	Variance percentage	Cumulative percentage of variance	Eigenvalues	Variance percentage	Cumulative generate percentage of variance						
1.	23.112	48.150	48.150	23.112	48.150	48.150						
2.	1.874	3.904	52.054	1.874	3.904	52.054						
3. 4.	1.432	2.984	55.038	1.432	2.984	55.038						
4.	1.268	2.642	57.680	1.268	2.642	57.680						
5. 6. 7.	1.190	2.480	60.160	1.190	2.480	60.160						
6.	1.138	2.371	62.531	1.138	2.371	62.531						
7.	1.028	2.141	64.671	1.028	2.141	64.671						
8.	0.948	1.974	66.646									
9.	0.896	1.867	68.513									
10.	0.853	1.777	70.290									
11.	0.830	1.729	72.019									
12.	0.771	1.605	73.625									
13.	0.727	1.515	75.140									
14.	0.721	1.501	76.641									
15.	0.652	1.359	77.999									
16.	0.626	1.304	79.303									
17.	0.613	1.276	80.579									
18.	0.604	1.258	81.837									
19.	0.554	1.153	82.990									

items with high coefficients are observed, according to which each factor is assigned a name.

It is noticeable that the first significant factor, which also carries the highest percentage of the total common variance in the data (48.150%) with an eigenvalue of 23.112, consists of 8 variables that contain elements of communication skills, football theoretical and practical knowledge, as well as computer skills. It consists of eight items and is called "Planning and Programming". The second factor is called "Analysis". It consists of 4 variables that explain 3.904% of the total variance in the data and has an eigenvalue of 1.874. All four items of this factor consist of questionnaire items related to performance monitoring and training/match analysis.

The third factor has an eigenvalue of 1.432 and 2.984% of the common variance. It consists of six items contained in the part of the questionnaire related to knowledge, performance monitoring and training/match analysis and is called "Application of diagnostic procedures".

Factor 4 consists of nine items and has an eigenvalue of 1.268 and 2.642% of the common variance. It is called "Personal example". It is composed of questionnaire items related to leadership and communication.

The eigenvalue of the fifth factor is 1.190, while the value of the common variance is 2.480%. Factor 5 is

called "Creativity" and consists of two items related to elements of training and match organization.

Factor 6 consists of seven items that account for 2.371% of the common variance and an eigenvalue of 1.138. It is called "Communication", and the items in the questionnaire relate to communication, organization of training and matches, and learning and teaching.

The last significant factor of the coaching and leadership competence scale, factor 7, consists of nine items with a negative sign that account for 2.141% of the common variance with an eigenvalue of 1.028. It is called "Coach educator", and it consists of items in the questionnaire that relate to communication, organization of training and matches, and learning and teaching.

#### DISSCUSSION

The first significant factor consists of 8 items that contain elements of communication skills, football theoretical and practical knowledge, as well as digital competences and is called "Planning Programming". Coaches believe that the most important coaching competences are those related to creating plans and programs for the training and competition process, as well as computer skills. In the book of Chapman, S. et al. (2007) it states that effective planning is the foundation for a successful season. The authors Wright, C. et al. (2014) state that player performance analysis, which is currently carried out with the help of various software programs, is an integral part of coaching work and provides indispensable feedback to coaches on the state of the team. Good communication skills are an integral part of this factor, and it is very important to know how to listen to your interlocutors and take useful advice into account. The result is partially in line with the research by Kjær, J. B. (2019) which states that coaches need good communication tools and knowledge to suppress conflicts and confrontational behavior of players and/or parents.

The second significant factor of the coaching and leadership competence scale consists of four items related to performance monitoring and analysis of training/matches. The factor is called "Analysis". A similar result was observed in the research by Di Minin, A. et al. (2014), where coaches consider it very important to possess the competencies that allow coaches to conduct analyses of both training and matches, and monitor and evaluate the performance of their players. Factor three consists of six items related to coaching knowledge, as well as performance monitoring and analysis of training/matches, and is called "Application of

Table 3: Assembly matrix - oblique (Oblimin) rotation (Coaching and leadership competencies)

	COMPONENTS						COMPONENTS							
40. I have appearance alithe and use visual side	246	2	34	48	5 800	041	7	25. I can inspire others to do what I require to ensure	503	2	3	4 89	5 92	6
13. I have computer skills and use visual aids	0	9 0.195	3 0.294	5 0.048	0	0	6 0.104	Success	0	1 -0.021	5 0.210	1 0.468	0.026	3 -0.001
18. I plan and preparation for every training session	0.530	0.159	-0.033	0.085	0.276	0.147	-0.106	28. I show respect for others and promote sportsmanship	0.189	-0.001	-0.055	0.394	0.167	0.138
20. I know exactly which way and in which direction I am leading my team	0.493	0.085	-0.001	0.203	-0.043	0.166	-0.224	32. I know how to instruct others to take responsibility and make decisions	0.338	-0.096	0.090	0.378	-0.345	0.124
11. I design game strategies that maximize the team's positive effects in the competition	0.475	-0.086	0.312	0.084	0.048	0.047	-0.182	5. I make statements to the media with a lot of confidence	-0.115	0.315	0.169	0.352	0.008	0.210
20. I plan and preparation for every game	0.436	0.252	-0.054	0.198	0.218	0.161	-0.081	I give clear and concise instructions to players and management	0.213	0.158	0.039	0.286	-0.095	0.229
2. I will listen carefully to my interlocutors when they have something to tell me	0.390	0.199	-0.035	0.122	-0.042	0.280	-0.183	23. I create each workout to be different from the previous one	0.085	-0.291	0.047	0.172	0.652	0.321
12. I'm up to date with the latest training and recovery methods	0.348	0.292	0.321	0.054	0.120	-0.103	-0.089	24. I predetermine the time, place, duration and number of participants for the pre-game meeting	-0.037	0.211	0.049	0.310	0.404	-0.078
I am up to date with the tactical and technical aspects of the game of football	0.313	0.292	0.157	0.068	0.117	-0.012	-0.183	47. I analyze trainings and take notes	0.149	0.258	0.260	-0.175	0.298	0.162
44. I watch videos of my team's matches and do analysis	0.013	0.809	0.007	0.075	-0.032	0.061	-0.079	8. I am patient in communication and do not allow myself to react hastily	0.139	0.067	0.289	-0.117	-0.031	0.664
41. I analyze the next opponent using video materials	0.025	997.0	0.092	0.135	-0.025	0.093	0.099	7. I avoid using unnecessary jargon and complicated language	-0.080	0.011	0.153	0.198	-0.039	0.537
43. I analyze my coaching performance and continuously improve myself	0.261	0.531	-0.008	0.091	-0.015	0.016	-0.261	Weather conditions affect the content of my training sessions and the tactics of the game in matches	-0.073	0.063	-0.120	0.026	0.203	0.519
42. My coaching focus is to increase player performance in competition	0.221	0.334	0.169	0.084	060.0	0.025	-0.265	4. I take care of my speech and non-verbal cues	0.353	0.049	-0.046	0.301	0.007	0.400
15. I know and apply tests to assess the physical fitness of players	0.029	0.109	0.765	0.033	0.041	0.013	0.069	17. I plan and use all protective measures during training and matches to protect players from possible injuries	0.237	0.062	0.166	0.003	0.158	0.360
14. I project club improvements and development for the future	0.052	0.002	0.630	0.034	-0.198	0.219	-0.107	I plan key competitions/season periods in advance	0.109	0.102	0.154	0.042	0.332	0.342
48. I use current measuring instruments in training	-0.216	0.258	0.626	0.102	0.211	-0.036	-0.002	3. I provide players with useful feedback on their work	0.315	0.118	0.082	0.160	-0.209	0.334
10. I apply knowledge from other sciences (e.g. anatomy and physiology) in my work	0.087	-0.193	0.605	0.036	0.022	0.062	-0.202	34. I work on the personal development of my players off the field as well	-0.085	0.082	0.044	0.014	-0.143	0.221
16. I implement an appropriate conditioning program for players during the season	0.093	0.208	0.490	0.273	0.047	0.076	0.204	36. I take care of the behaviour and culture of my players	-0.040	-0.056	0.084	0.272	0.013	-0.040
46. I individualize the training sessions according to the objective indicators of the physical fitness of each player	-0.069	0.322	0.348	-0.047	0.189	0.003	-0.316	35. I teach the players a healthy lifestyle (proper nutrition, recovery, regular sleep)	-0.075	0.165	0.032	0.244	-0.051	0.160
26. I am a good role model	-0.040	0.073	0.065	0.736	0.042	-0.062	-0.117	38. I teach players about the importance of a good warm-up and its effects	0.102	0.098	0.124	0.104	0.190	0.019
30. I am an example to players with my lifestyle and appearance	-0.220	0.000	0.041	0.671	0.035	0.206	-0.111	40. I stimulate and correct the players in their work	0.277	0.001	0.180	0.148	0.089	-0.045
27. I can convince others to trust me and follow me	0.271	0.115	0.080	0.601	0.170	-0.174	0.050	39. I make corrections by giving positive or negative feedback	0.248	-0.218	0.307	0.176	0.105	-0.062
31. I am able to solve problems effectively and creatively	0.190	0.100	0.058	0.575	0.034	0.031	-0.092	33. I teach players tactical and technical soccer skills	0.382	0.270	-0.018	-0.066	0.118	0.028
6. I effectively resolve conflict situations	0.100	0.181	0.046	0.522	0.053	0.101	0.015	45. I evaluate how each player is progressing in training and matches	0.189	0.383	0.108	-0.047	0.076	0.058
								29. I demonstrate a player-centric approach	290.0	-0.012	0.303	0.194	0.029	0.145
										_ '				

diagnostic procedures". Coaches consider it very important to possess a wide range of knowledge, both in football and other sciences, which enables them to implement and apply various diagnostic procedures, which is partially in line with the results of previous research (Sieghartsleitner, R. et al., 2019; Akenhead, R., & Nassis, G. P., 2016). However, according to the results of this research, coaches should have a vision and a broad picture of the club's future projection,

which contrasts with the results of the research by Di Minin, A. et al. (2014), which states that the task of top management is to make decisions of strategic importance.

The fourth factor is called "Personal example". It consists of nine items related to leadership and communication competencies. Coaches should set an example with their behavior and have good

communication skills with which they will find purposeful solutions in conflict situations and thus maintain a good team atmosphere, which is partially in line with the results of previous research by Partington, M., Cushion, C., & Harvey, S. (2014).

The fifth factor is called "Creativity" and consists of two items related to the elements of training and match organization. Coaches believe that it is necessary to be creative when creating training units, as well as to be timely and accurate. However, in order for coaches to be creative, it is necessary to have a large fund of knowledge and the necessary material resources, which will enable them to create and implement creative and interesting training content. Similar results were observed in the work of Moustakas, L., & Kalina. L. (2022), where five key elements for the implementation of a successful training unit were highlighted: the interest of football players in the topic of the training unit, the quality of the resources provided, interactivity and mutual engagement, the organization of the content and the time of the training. Factor 6 consists of seven items and is called "Communication". The items of the questionnaire relate to communication and the organization of training and matches. Coaches believe that they must take care of their way of communicating with players and that it is a very important factor in creating a good atmosphere and team cohesion. A similar result is reported in the study of Pain, M., & Harwood, C. (2009), where it is said that open and honest communication about the functioning of the team can improve team cohesion.

Factor 7 is the last significant factor of the scale of coaching and leadership competence, which consists of nine items and is called "Coach educator". Almost all items of this factor relate to the learning and teaching of players by coaches. Coaches do not see players as objects but approach them thoroughly and individually. They strive to teach players the necessary football knowledge and skills and consider it necessary to assess the level of acquisition of these knowledge and skills. "Coach educator" implies a coach as a comprehensive personality, who, in addition to coaching knowledge and skills, must have the ability to recognize the needs of their players and approach them in accordance with these same needs. This result is partially in line with the results of the study by Potrac. P., Jones, R., and Armour, K. (2002), which states the importance of establishing a strong social bond between coach and player. With a holistic approach, coaches create a social bond between them.

# **CONCLUSION**

It is noticeable that the general opinion of coaches about the importance of certain competencies is

Coaches gave the greatest probably wrong. importance to the competencies that enable coaches to "plan and program" the training and competition process. Then, coaches believe that the next most important competencies are those that enable the process of "analyzing" training and matches, both their own team and the opponent's. In third place are the competencies responsible for the application of various diagnostic procedures. This includes knowledge and skills from medical and other sciences, without whose implementation in modern football, it is difficult to achieve top results. The next less important competencies are those by which the coach sets himself as a personal example to the players, and this includes leadership and communication skills that coaches consider necessary in order to establish healthy relationships and be a role model for their players and the wider public, "Creativity" is the name of the next important competency. In order for players to be maximally motivated to work, coaches believe that by creating interesting and diverse training units, they will establish a good team atmosphere and keep the players "awake" and "hungry". With this approach, coaches instill in players the desire to work and achieve better results. The next less significant factor is called "communication", according to which coaches believe that they must arm themselves with communication tools and skills, take care of their communication method, behavior, which can significantly influence the relations between players and their team approach. The last "significant" factor is called "coach educator" which suggests that coaches should work on the mental, emotional and physical development and building of their players.

According to the author, the order of importance of coaching and leadership competencies should be completely reversed. Thus, the basis of coaching competences should be the competences by which they become "transmitters" of knowledge, not only football, by which coaches are distinguished as "educators" who use a "holistic" approach to transfer knowledge and train players with skills, considering the psycho-emotional states of the players. This should be followed by communication competencies, creativity, example, application of diagnostic procedures, analysis and finally by competencies that enable coaches to plan and program training and competition processes. Perhaps this misperception of the importance of certain coach competencies is the reason why we have a relatively weak football league, as well as the fact that football clubs from Bosnia and Herzegovina cannot make any significant and noticeable progress when it comes to international matches.

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# **Conflict of Interest**

The authors do not have any conflicts of interest to disclose. All co-authors have reviewed and concurred with the manuscript's content, and no financial interests need to be reported.