EVALUATION OF VOLLEYBALL TECHNIQUES – DIFFERENCES BETWEEN EXPERT AND NOVICE COACHES

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Abstract

Six expert and four novice coaches evaluated the technique quality of 109 young female volleyball players, whose average age was 15.4±2.6 years, using the video recordings of their playing. The aim of the evaluation was to determine the differences in volleyball technique evaluation (serve, serve reception, attack and block). The conclusion, based on the descriptive indicators, was that both groups of coaches, on average, used similar evaluation marks, and those expert coaches used a wider range of marks more often than the novice coaches. In all of the volleyball technique evaluation tests, the expert reviewers had higher mutual correlations than the novice coaches. Novice coaches had somewhat lower homogeneity and congruence in the mutual object of measuring: reviewing the serve technique, serve and attack, and especially the block technique, what could be anticipated, due to the complexity of the technique element. Variance analysis determined the non-homogeneity of the expert, and especially the novice coaches, in volleyball technique elements evaluation. The obtained results indicate that volleyball technique evaluation skills should be more present in the process of volleyball experts' education. The development of these skills is the first step in the process of perfecting the techniques of volleyball elements.

Key words: *female players, objectivity and homogeneity, detecting errors in technique*

Introduction

According to Janković and Marelić (1995), specific motor knowledge (volleyball techniques) represents the complex of volleyball elements essential in solving concrete tactic tasks in different game situations. The technique is the most rational mode of performing a certain movement. This movement performance respects the structural and biomechanical characteristics of movement. A good volleyball elements technique is positively correlated to the game success (Thissen Milder et al. 1991, Stamm, 2004, Grgantov 2005). The aim of every sport is automatization of the correct technique, a process that requires a great number of repetitions (McGown 1994, Knudson and Morrison 2002, Grgantov 2005). This way, the player does not have to think about the correct movement performance during the game, but simply about the most useful tactical solution in the given moment. In successful technique learning, a person giving the instructions (coaches, teachers…) should present the aims of the technique, demonstrate it and give feedback (key words) during the process of learning the volleyball techniques. In the research conducted by Kounturisa and Yannisa (2007), volleyball beginners, who were given feedback concerning the attack performance during the exercise, had significantly better results after 12 one hour training sessions than the control group, who performed the exercise without the feedback. Considering the abovementioned, a conclusion can be made – giving the correct information concerning the movement, finding the key words for each volleyball skill, and finding the order of their introduction, is a demanding skill that volleyball coaches should aim to perfect.

To fully accomplish this mission, coaches should be capable of noticing every deviation from the ideal technique. An additional obstacle to this aim is the fact that, during a training session, coaches must observe the performance of a great number of players at the same time.

Problem and aim

Numerous research studies conducted on coaches in different sports (e.g., Peterson and Comeaux 1987, Woorons 2002) indicate that the knowledge of expert coaches is hierarchically organized, interrelated, causing the more immediate noticing of important movement details, dividing important from the unimportant and adjusting to the newly created situations. Therefore, it can be assumed that more expert volleyball coaches will be more uniform and compliant in the volleyball elements technique evaluation than the novice coaches (Bian 2003). Therefore, the main aim of this research was to determine whether the expert volleyball coaches differ from the novice ones in the ability to evaluate volleyball technique (serve, serve reception, attack and block).

Methods

The subject sample of this research included 109 female volleyball players, members of different clubs from County of Split-Dalmatia, County of Zagreb and County of Istra, whose average age was 15.4 ±2.6 years. The variable sample consisted of 4 serve techniques, serve reception, attack and block evaluation tests. The tests were constructed and validated for all junior female

volleyball players' categories. A detailed description of tests, reviewer instructions and the key performance parts can be found in research by Grgantov (2005). From the total of 6 techniques used in this research 4 have been chosen, two performed while standing on the ground, and two while jumping. Attack and block, performed while jumping, are technically the most demanding volleyball elements, so it was assumed that these techniques would be more demanding for coaches to estimate. During each test, the examinees, in sequence, performed 4 repetitions of a certain technique. All the tests were recorded by a video camera. Based on the video recordings, 10 reviewers estimated the volleyball players' technique quality, using the scale ranging from 1 to 5. Six out of 10 reviewers were expert coaches, with long-standing coaching experience, while 4 reviewers attended the volleyball modules at the Faculty of Kinesiology in Split and had little or no coaching experience. All the coaches were introduced to the technique reviewing methods. With the purpose of achieving the aim of the research, basic descriptive indicators of the reviewers in the tested variables were calculated (mean and standard deviation), as well as the intercorrelations between the coaches. After this, the objectivity of the coach-reviewer was calculated, by applying the intercorrelation matrix and calculating the inter-item correlation and Cronbach alpha coefficient, separately for the expert and the novice coaches. By applying the

ANOVA procedure of analyzing the differences between the reviewers, the homogeneity of the coaches' volleyball technique estimations was calculated (separately for the group of expert coaches and separately for the novice group). The data was processed by the "Statistica for Windows" statistical package, version 7.0.

Results

Table 1 Basic descriptive indicators of the volleyball technique reviewers – mean (M) and the standard deviation (SD)

Coaches	SERVE		SREC		ATTACK		BLOCK	
	M	SD	M	SD	M	SD	M	SD
1	2.89	1.36	2.83	1.28	2.27	1.19	2.43	1.25
2	3.07	1.11	3.42	1.22	2.99	1.13	3.30	1.17
3	3.23	1.12	3.61	1.04	2.96	1.04	3.32	0.91
4	3.06	1.34	3.27	1.16	3.13	1.16	3.28	1.16
5	3.25	1.34	3.13	1.03	3.39	1.08	3.31	1.02
6	2.89	1.36	3.08	1.23	2.61	1.28	2.47	1.14
7	3.23	0.98	3.45	0.98	3.39	0.88	3.67	0.78
8	3.28	0.78	3.14	0.74	2.94	0.74	2.93	0.57
9	2.21	0.89	2.51	0.78	1.89	0.85	2.12	0.74
10	3.40	1.03	3.91	0.87	3.06	0.86	3.45	0.86

Legend: 1-10 ordinal number of the technique reviewer coaches; M - mean; SD - standard deviation

Table 2 The intercorrelation matrix of reviewers regarding the serve technique

	SERV1	SERV2	SERV3	SERV4	SERV5	SERV6	SERV7	SERV8	SERV9	SERV10
SERV1	1.00	0.77	0.76	0.82	0.80	0.77	0.54	0.66	0.79	0.77
SERV2	0.77	1.00	0.73	0.73	0.73	0.63	0.54	0.54	0.67	0.74
SERV3	0.76	0.73	1.00	0.75	0.74	0.67	0.64	0.50	0.76	0.72
SERV4	0.82	0.73	0.75	1.00	0.87	0.72	0.63	0.58	0.74	0.81
SERV5	0.80	0.73	0.74	0.87	1.00	0.66	0.62	0.52	0.68	0.77
SERV6	0.77	0.63	0.67	0.72	0.66	1.00	0.60	0.58	0.73	0.70
SERV7	0.54	0.54	0.64	0.63	0.62	0.60	1.00	0.34	0.57	0.59
SERV8	0.66	0.54	0.50	0.58	0.52	0.58	0.34	1.00	0.58	0.56
SERV9	0.79	0.67	0.76	0.74	0.68	0.73	0.57	0.58	1.00	0.72
SERV10	0.77	0.74	0.72	0.81	0.77	0.70	0.59	0.56	0.72	1.00

Legend: SERV1 – SERV10: the correlation of the coaches' serve technique evaluations

Table 3 The intercorrelation matrix of reviewers regarding the serve reception technique

	SREC1	SREC2	SREC3	SREC4	SREC5	SREC6	SREC7	SREC8	SREC9	SREC10
SREC1	1	0.69	0.67	0.75	0.64	0.72	0.68	0.59	0.60	0.72
SREC2	0.69	1	0.76	0.65	0.63	0.66	0.76	0.65	0.62	0.63
SREC3	0.67	0.76	1	0.68	0.62	0.71	0.82	0.64	0.62	0.73
SREC4	0.75	0.65	0.68	1	0.76	0.69	0.71	0.61	0.64	0.70
SREC5	0.64	0.63	0.62	0.76	1	0.65	0.63	0.53	0.50	0.61
SREC6	0.72	0.66	0.71	0.69	0.65	1	0.75	0.45	0.61	0.66
SREC7	0.68	0.76	0.82	0.71	0.63	0.75	1	0.57	0.66	0.64
SREC8	0.59	0.65	0.64	0.61	0.53	0.45	0.57	1	0.57	0.56
SREC9	0.60	0.62	0.62	0.64	0.50	0.61	0.66	0.57	1	0.61
SREC10	0.72	0.63	0.73	0.70	0.61	0.66	0.64	0.56	0.61	1

Legend: SREC1- SREC10: correlation of the 1-10 coaches' evaluation of the serve reception technique

Table 4 The intercorrelation matrix of reviewers regarding the attack technique

	AT1	AT2	AT3	AT4	AT5	AT6	AT7	AT8	AT9	AT10
AT1	1.00	0.72	0.72	0.68	0.64	0.70	0.62	0.61	0.73	0.73
AT2	0.72	1.00	0.74	0.72	0.74	0.68	0.64	0.61	0.57	0.66
AT3	0.72	0.74	1.00	0.68	0.71	0.65	0.68	0.63	0.58	0.67
AT4	0.68	0.72	0.68	1.00	0.73	0.67	0.62	0.58	0.54	0.62
AT5	0.64	0.74	0.71	0.73	1.00	0.66	0.65	0.59	0.44	0.60
AT6	0.70	0.68	0.65	0.67	0.66	1.00	0.60	0.54	0.55	0.57
AT7	0.62	0.64	0.68	0.62	0.65	0.60	1.00	0.65	0.54	0.59
AT8	0.61	0.61	0.63	0.58	0.59	0.54	0.65	1.00	0.60	0.58
AT9	0.73	0.57	0.58	0.54	0.44	0.55	0.54	0.60	1.00	0.61
AT10	0.73	0.66	0.67	0.62	0.60	0.57	0.59	0.58	0.61	1.00

Legend: AT1-AT10: correlation of the 1-10 coaches' evaluation of the attack technique

Table 5 The intercorrelation matrix of reviewers regarding the block technique

	BLOCK1	BLOCK2	BLOCK3	BLOCK4	BLOCK5	BLOCK6	BLOCK7	BLOCK8	BLOCK9	BLOCK10
BLOCK1	1.00	0.63	0.71	0.72	0.64	0.66	0.50	0.34	0.72	0.61
BLOCK2	0.63	1.00	0.65	0.57	0.49	0.59	0.59	0.43	0.53	0.67
BLOCK3	0.71	0.65	1.00	0.69	0.53	0.56	0.44	0.26	0.59	0.64
BLOCK4	0.72	0.57	0.69	1.00	0.73	0.64	0.40	0.42	0.54	0.61
BLOCK5	0.64	0.49	0.53	0.73	1.00	0.58	0.36	0.23	0.43	0.52
BLOCK6	0.66	0.59	0.56	0.64	0.58	1.00	0.43	0.34	0.45	0.57
BLOCK7	0.50	0.59	0.44	0.40	0.36	0.43	1.00	0.30	0.42	0.54
BLOCK8	0.34	0.43	0.26	0.42	0.23	0.34	0.30	1.00	0.26	0.35
BLOCK9	0.72	0.53	0.59	0.54	0.43	0.45	0.42	0.26	1.00	0.48
BLOCK10	0.61	0.67	0.64	0.61	0.52	0.57	0.54	0.35	0.48	1.00

Legend: correlation of the 1-10 coaches' evaluation of the block technique

Table 1 shows the basic descriptive indicators of the reviewers, for the volleyball technique evaluation variables.
Based on the results shown in table 1, the following conclusions can be drawn:
- Both groups of coaches, on average, chose similar marks (slightly above 3). The exceptions were coaches number 1 and 6 in expert coaches, and number 9 in young experts, who seemed to be more "strict" than the other coaches.
- The expert coaches used the whole range of marks more often (higher SD values) than the novice coaches.

Tables 2-5 show the reviewer intercorrelation matrix in the volleyball technique estimation variables. Coaches 1-6 were more experienced, while coaches 7-10 were novice. By analyzing the intercorrelation matrix an observation can be made – in all of the volleyball evaluation techniques the expert coaches had higher mutual correlations than the novice ones. However, for the purpose of this research, it was more important to determine the extent to which the marks of the young coaches were congruent (correlated) with the marks of the more experienced volleyball experts, representing some form of a model value. The hardest task for the young coaches was the block technique evaluation (this variable had the lowest correlation with the expert coaches), while the other 3 techniques (serve, serve reception and attack) marks were in higher correlation with the marks of

the expert coaches. Among the novice coaches, coach number 10 had high correlation values with the expert coaches in all of the techniques, while those values were somewhat lower for the rest of the reviewers (coach number 8 had the lowest correlation). Table 6 shows the values of the Cronbach's alpha coefficients and the average reviewers' correlation – separate for the expert and the novice coaches. Besides this, table 6 shows the conducted variance analysis, containing the F-values, with the significance level of differences between the two groups of coaches.

Table 6 Values of the Cronbach's alpha coefficient (CA), average correlation between the reviewers (COR), and F-test of significance between the technique reviewers (F), separately for the expert coaches (GROUP1) and the novice coaches (GROUP2), for the volleyball technique evaluation variables.

Variables	GROUP 1 (N=6)			GROUP 2 (N=4)		
	CA	COR	F	CA	COR	F
SERV	0.94	0.75	6.13***	0.84	0.57	87.80***
SREC	0.93	0.69	18.85***	0.85	0.60	128.75***
ATTACK	0.93	0.70	42.20***	0.85	0.60	161.00***
BLOCK	0.91	0.63	45.13***	0.72	0.40	155.00***

Legend: *significant at the level of 0.05, ** significant at the level of 0,01, *** significant at the level of 0,001

Table 6 shows high Cronbach's alpha coefficient values in expert coaches, showing great homogeneity in estimating the volleyball elements technique. The correlation coefficient among the reviewers indicates the reviewers' congruence in the mutual object of measuring. These values were somewhat lower than in Cronbach's alpha, and were the lowest in block technique. The F-test values show the non-homogeneity of the expert coaches, and especially the novice coaches in evaluating the volleyball elements technique.

Discussion and conclusion

The analysis of descriptive indicators of coaches' evaluations (table 1) shows that the expert coaches use the whole range of grades more often than the novice ones. It can be assumed that the novice coaches prefer the average grades due to their lack of experience and insecurity. The novice coaches had somewhat lower homogeneity and congruence on the mutual object of measuring while evaluating the serve, serve reception and attack technique, and especially the block technique, due to the complexity of the technique element. The authors assumed that while evaluating the attack technique, the young coaches would have lower values of the coefficients observed, compared to the serve and serve reception, which are simpler. The error of this presumption can possibly be explained by the attractiveness of the attack, considered important by players and coaches alike, in training and competition, so it was logical that they were well acquainted with the correct technique and the most common deviations from the correct technique. The non-homogeneity of the "expert" coaches can partly be explained by a low measuring scale, with great difference from one grade to another. Also, different previous experience of the coaches in volleyball elements grading, and the non-existent systematic work in perfecting the evaluation technique while educating the coaches, probably contributed to the observed non-homogeneity. In this research, the reviewers were not only the means of constructing and validating the volleyball technique evaluation, rather, technique evaluation is analyzed as a coaching skill, indispensable in detecting the deviations from the ideal technique, which is an important step in the process of perfecting the volleyball technique. However, it is important to note that technique evaluation in the training process is much more demanding than the evaluation of examinees in this research (evaluation of examinees one by one, using video recording). Namely, during a training session, a volleyball coach must detect and correct the errors of more than one player at the same time (without

the possibility of repetition or slowing down the recording, as can be done on a DVD set or a video camera). Considering that there is no systematic training of volleyball coaches in players' technique evaluation in Croatia, a question can be asked: Does coaching experience guarantee the expert level of volleyball technique evaluation? The authors of this research consider that it does not, especially since it is only one of the many coaches' tasks within the sports games. Considering this, it is possible that certain coaches have good results even though they do not have a high level volleyball technique evaluation quality. Certain coaches pay much attention to the process of perfecting the volleyball technique and are real experts in the field. However, in practice one can often meet expert volleyball experts with little quality in this area, but very successful in e.g. tactical or motivational segment. The conclusion, based on the results, is that the expert coaches are somewhat more homogeneous than the novice coaches in the volleyball technique quality estimation. However, it cannot be decidedly claimed that there is a significant difference in the ability of technique quality evaluation between the groups of coaches with different experience. It would be more correct to claim that certain coaches stand out in every group (not the same ones in each of the variables), impairing the objectivity and homogeneity of the group of reviewers. To enable more reliant conclusions concerning the quality of coaches' volleyball technique evaluation, future research should use the scale of marks from 1 to 5, but with a possibility of giving halves (e.g., 1.5 or 4.5), and eventually this scale could be expanded to values from 1 to 10. Also, research should be conducted in circumstances similar to training situations (e.g., reviewers grade several players during training exercise). To gain a detailed insight into the error detecting quality of certain coaches, they should, while writing the mark, describe all the deviations from the ideal technique in a certain player, using the same prepared form, and categorize them as minor, medium of major deviations. Numerous research (e.g., Stamm 2004, Grgantov 2005) have confirmed the fact that the high quality of the overall volleyball technique is an indispensable precondition of a volleyball player's situational efficacy. In relation to this, the authors consider that during the process of volleyball experts' education, more attention should be paid to the volleyball techniques evaluation skills. These skills at the same time present the foundation of a high quality process of teaching in which usage of quality demonstration, choice of convenient exercise and other methodic processes, would result in perfection of players` technique.

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EVALUACIJA ODBOJKAŠKE TEHNIKE – RAZLIKE IZMEĐU TRENERA EKSPERATA I TRENERA POČETNIKA

Sažetak

S ciljem utvrđivanja razlika u sposobnosti procjene odbojkaških tehnika (servisa, prijema servisa, smeča i bloka) 6 iskusnijih trenera i 4 trenera početnika procjenjiva su s video zapisa kvalitetu tehnike 109 mladih odbojkašica prosječne dobi 15.4 ± 2.6 god. Na osnovu deskriptivnih pokazatelja utvrđeno je da obje grupe trenera u prosjeku daju slične ocjene, te da iskusniji treneri više koriste čitav raspon ocjena od trenera početnika. U svim testovima za procjenu odbojkaških tehnika, iskusniji ocjenjivači imaju veće međusobne korelacije od trenera početnika. Treneri početnici imaju nešto nižu ujednačenost i slaganje u zajedničkom predmetu mjerenja u ocjenjivanju tehnika servisa, prijema servisa i smeča, a naročito u tehnici bloka što se i moglo pretpostaviti zbog kompleksnosti tog elementa tehnike. Analizom varijance utvrđena je nehomogenost iskusnijih trenera, a naročito trenera početnika u ocjenjivanju tehnike odbojkaških elemenata. Dobiveni rezultati ukazuju, da bi se u procesu izobrazbe odbojkaških stručnjaka, veća pažnja trebala posvetiti razvijanju vještina procjenjivanja odbojkaških tehnika. Razvijanje tih vještina predstavlja prvi korak u procesu usavršavanja tehnika odbojkaških elemenata.

Ključne riječi: *mlade odbojkašice, objektivnost i homogenost, uočavanje grešaka u tehnici*