

**NATIONAL SPORTS ACADEMY VASIL LEVSKI  
DLLIT**



**KAMELIYA VIHRENOVA DIMITROVA**

**INFORMATION SYSTEM FOR OPTIMIZATION THE  
ORGANIZATION AND MANAGEMENT OF THE FOOTBALL  
TRAINING PROCESS IN CHILDREN AND ADOLESCENT AGE**

**ABSTRACT OF A DISSERTATION**

**Sofia, 2020**



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**for affiliation of a doctoral degree in professional direction 7.6. – “Sports”, in  
doctoral curriculum “Theory and methodology of sport science”**

**Научен ръководител:**

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**Sofia, 2020**

The dissertation was discussed and admitted to the defense of an internal discussion of DLLIT, which took place on 02.10.2020.

The dissertation contains 149 pages, in which 59 figures, 38 tables, 5 appendices and 12 pages of literature sources, including 120 scientific and methodological sources.

The defense of the dissertation will take place on 10.12.2020. from 13:00 in Hall A3 of the National Sports Academy "Vasil Levski", at an open meeting of the jury consisting of:

1. Prof. Lachezar Vasilev Dimitrov, PhD
2. Assoc. prof. Arahangel Grigorov Gigov, PhD
3. Prof. Dimitar Tanev Kaykov, DSc
4. Prof. Krastiu Dimov Tsarov, PhD
5. Assoc. Prof. Asya Krasteva Tsarova-Vasileva, PhD

Materials for the defense can be found in room 336 at the National Sports Academy "Vasil Levski"

Author: Kameliya Vihrenova Dimitrova

Title: Information system for optimization the organization and management of the football training process in children and adolescent age

## **GENERAL CHARACTERISTICS OF THE DISSERTATION**

This dissertation consists of four chapters, a list of cited literature and appendices. The main content is contained in 149 pages, and the exhibition is accompanied by figures and tables. The list of cited literature includes 120 scientific and methodological sources.

### **Actuality of the subject**

From the literature analysis, the need to optimize the means and methods for the control of sports and competitive activities is clearly distinguished. It is possible to add new ones to the already existing practices and knowledge in this field, by using modern methods, digital products and technical equipment for control and analysis of sports activities.

### **Target and subject of the study**

The **object** of research is the optimization of the management of the football training process in children and adolescents. The **subject** of the present study is a digital coaching diary based on MS Excel software.

### **Methodology of the study**

For the realization of the research and the related tasks, we used the following methods:

- General methods
  - open discussion
  - questionnaire
- Statistics
  - frequency analysis
  - comparative analysis

- correlation analysis
- Wilcoxon Signed Ranks Test

### **Scientific novelty of the dissertation**

Within the Bulgarian practice, a digital product has not been developed and implemented in the practice, which would serve the specific needs of the specialists of a certain type of sports discipline, regarding their work on organization and management of the training process, as well as one that would provide the coaches with adequate and timely feedback from their competitors. For the first time, a methodical sequence for creating a digital coaching diary, inherent in the specific needs of a sport, has been created.

### **Practical significance of the results**

Implementation of a software product in the work on organization and management of the training and competition process for children football players. Construction and inclusion in the work of the youth academy at PFC Levski Sofia of a digital coaching diary, entirely created according to the needs of the football coaches, as well as according to the specifics of children's and youth football.

### **Structure of the dissertation**

Chapter I. Literature analysis – 62p.

Chapter II. Aim, tasks, organization and methodology of the study – 19p.

Chapter III. Analysis of the results – 42p.

Chapter IV. Conclusions and recommendations – 4p.

Literature – 12p.

Appendixes – 10p.

## **CONTENTS OF THE DISSERTATION**

### **Chapter I. Literature analysis**

Chapter I. provides an analysis of literature sources that provide knowledge about other achievements in the field of the problem, as well as those close to its essence. A total of 115 literature sources were studied and used.

The role and importance of information and the information process are presented. In unison with the topic of the dissertation in separate subchapters, the following are purposefully presented:

- characteristic features and specifics of the information and information activities in the sport and outside it;
- types of models, modeling and methods for information process management;

There is a special place for:

- the information system in the sports club;
- information technologies in sports in general and in football in particular;
- the problem with the use and construction of modern and adaptive digital products in the system studied by the doctoral student is described in detail;

## **Chapter II. Aim, tasks, organization and methodology of the study**

**Aim** - to study the difference in the effectiveness of the management and organization of the football training process in children and adolescents, through the development and implementation in the training process of a digital coaching diary.

### **Tasks**

1. Research of the existing scientific-methodical literature, regarding the digitalization of the sports-pedagogical process and the resulting changes in its organization.

2. Research of the digital competence of the Bulgarian football specialists, as well as their knowledge about IT technologies in the training and competition process.

3. Study of the attitudes of football coaches regarding the digital organization of the sports-pedagogical process.

4. Preparation of a digital version of a coaching diary, based on MS Excel software, in accordance with the needs and recommendations of football specialists.

5. Implementation of the digital product in the work of Bulgarian football coaches from the youth academy - acquaintance with the functionality of the product and ways to manage and organize the training and competition activities.

6. Analysis of the work of the native coaches with a digital coaching diary and research of their opinions about the change in the organization of the training and competition activity.

The specialized sports-pedagogical tests used are presented in detail in Table 1.

Table 1.

Tests used in the dissertation

|          |   |
|----------|---|
| <b>№</b> | <b>General methods</b>  |
| 1.       | Questionnaire   |
| 2.       | Discussion  |
|          | <b>Statistics</b>   |
| 1.       | Frequency analysis - one-dimensional and two-dimensional distribution |
| 2.       | Correlation analysis  |
| 3.       | Comparative analysis by t-test for dependent samples                  |
| 4.       | Wilcoxon Signed Ranks Test  |

### **Chapter III. Analysis of the research results**

#### **1. Questionnaire 1 - digital competencies of football specialists**

We have compiled a questionnaire (Appendix 1), which will give us an in-depth overview of the knowledge of football coaches from the Bulgarian practice, in terms of their computer literacy, skills and willingness to implement in their work products and services inherent in the technological requirements of modern sport.

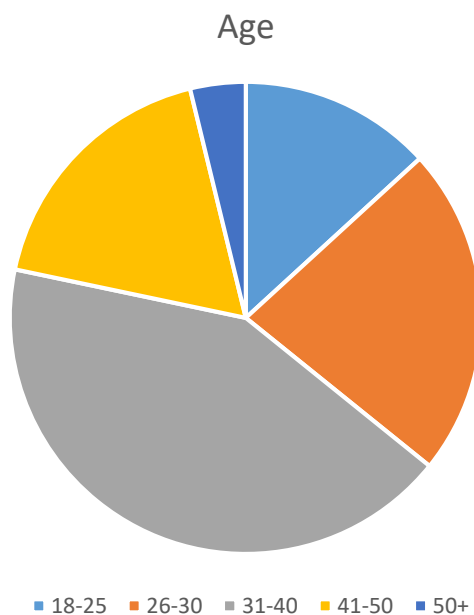


Fig. 1. Age distribution

Table 2. Age distribution

| age   |       |           |         |               |                    |
|-------|-------|-----------|---------|---------------|--------------------|
|       |       | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | 18-25 | 14        | 13,2    | 13,2          | 13,2               |
|       | 26-30 | 24        | 22,6    | 22,6          | 35,8               |
|       | 31-40 | 45        | 42,5    | 42,5          | 78,3               |
|       | 41-50 | 19        | 17,9    | 17,9          | 96,2               |
|       | 50+   | 4         | 3,8     | 3,8           | 100,0              |
|       | Total | 106       | 100,0   | 100,0         |                    |

- For the most part, the specialists surveyed by us are aged 31-40 - 42.5%. In second place are the coaches in the age range 26-30 years - 22.6%. Together with 18-25 year olds (13.2%), young professionals and middle-aged ones make up a total of 78.3% of all respondents. The older coaches - 41-50 years old and 50 years old + are 17.9% and 3.8% respectively.

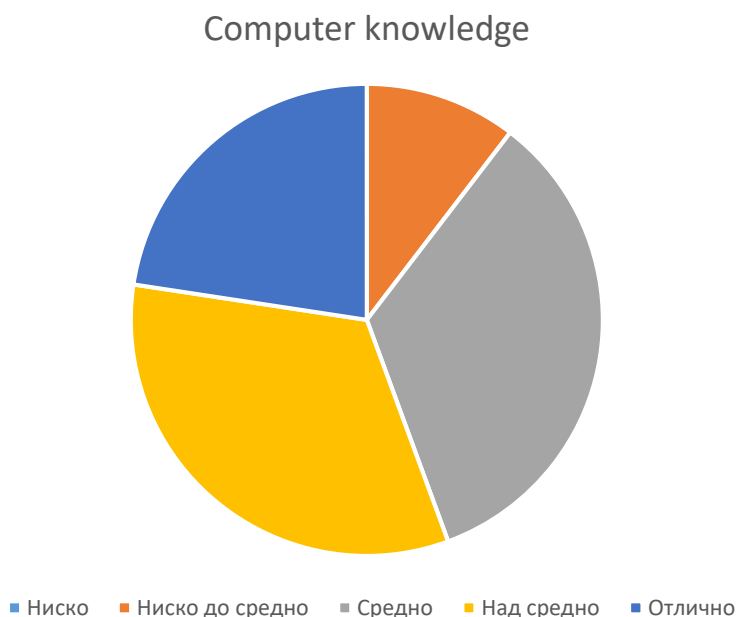


fig. 2. Level of computer knowledge

table 3. Level of computer knowledge

| Comp_know |                 |           |         |               |                    |
|-----------|-----------------|-----------|---------|---------------|--------------------|
|           |                 | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid     | Ниско до средно | 11        | 10,4    | 10,4          | 10,4               |
|           | Средно          | 36        | 34,0    | 34,0          | 44,3               |
|           | Над средно      | 35        | 33,0    | 33,0          | 77,4               |
|           | Отлично         | 24        | 22,6    | 22,6          | 100,0              |
|           | Total           | 106       | 100,0   | 100,0         |                    |

- Exactly one third of the respondents (33.0%) define their level of computer literacy as “above average”. 22.6% of the specialists define their level as excellent. With the answers arranged in this way, more than half of the coaches would have no difficulty in using different types of software - something very important for our project. The rest rated their skills as "low to medium" (10.4%) and "medium" (34%).

- The answers regarding the knowledge in foreign languages determine that more than half of the coaches (51.9%) know at least one foreign language - essential when working with the Internet and digital products. The fact that a little over a quarter (25.5%) of the respondents do not know any language other than Bulgarian makes a strong impression. This would be a problem for them when working with software products. The lowest percentage - 22.6% are those who have knowledge in more than one foreign language.

- With the increase of digitalization and on-line communications, it was important for us to understand how far computers have entered the field of activity of football coaches. As expected, 96.2% of them use a computer in their work, which implies the corresponding software. Only 3.8% of respondents say that they do not have to use a computer. Most football professionals are aware of the means to develop speed endurance.

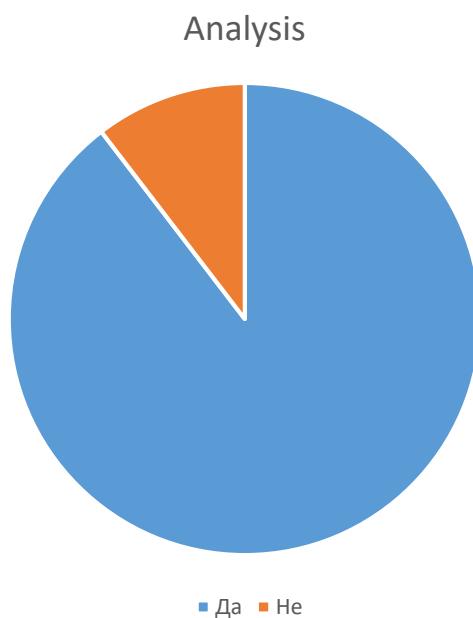


Fig. 3. Coaching analysis

Table 4. Coaching analysis

| analysis |       |           |         |               |                    |
|----------|-------|-----------|---------|---------------|--------------------|
|          |       | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid    | Да    | 95        | 89,6    | 89,6          | 89,6               |
|          | Не    | 11        | 10,4    | 10,4          | 100,0              |
|          | Total | 106       | 100,0   | 100,0         |                    |

- The analysis and processing of information regarding the conduct of the competition and training process is an integral part of coaching. Quite logically, the majority of the surveyed coaches make an analysis of the activity of their athletes. Nearly 90% (89.6) of them keep a coaching diary or analyze their alumni 's meetings. Just over 10% (10.4) of all state that they do not keep statistics on their activities.

## 2. Questionnaire 2 - need for specialized application.

After researching existing types of products and applications, we considered it most appropriate for the digital diary to specialize in the work of football professionals. That is why we have compiled a questionnaire with which to get a maximum idea of the specifics of work and the requirements of football coaches, the functionality of the digital product.



Fig. 4. Processing information

Table 5. Processing information – frequency analysis

| processing |                     |           |         |               |                    |
|------------|---------------------|-----------|---------|---------------|--------------------|
|            |                     | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid      | На хартия           | 16        | 10,7    | 10,7          | 10,7               |
|            | Преносим, дигитален | 125       | 83,9    | 83,9          | 94,6               |
|            | Стационарен         | 6         | 4,0     | 4,0           | 98,7               |
|            | Не въвеждам         | 2         | 1,3     | 1,3           | 100,0              |
|            | Total               | 149       | 100,0   | 100,0         |                    |

- When asked how they prefer to enter the information related to the training and competition process, the native coaches categorically state that they prefer to use a portable digital medium (such as a smartphone, tablet, etc.) - 83.9% of them state this way. Approximately one in ten football coaches prefer to enter their information on paper - 10.7%. Football exercises are often illustrated with drawings, which in our opinion is the main reason to use this method, which gives considerable freedom to the introducer. Only 4% of the respondents use a desktop computer, which is

logical compared to the laptops that have long been in practice. Only two of all respondents - 1.3% say they do not enter any information about the training process of their players.

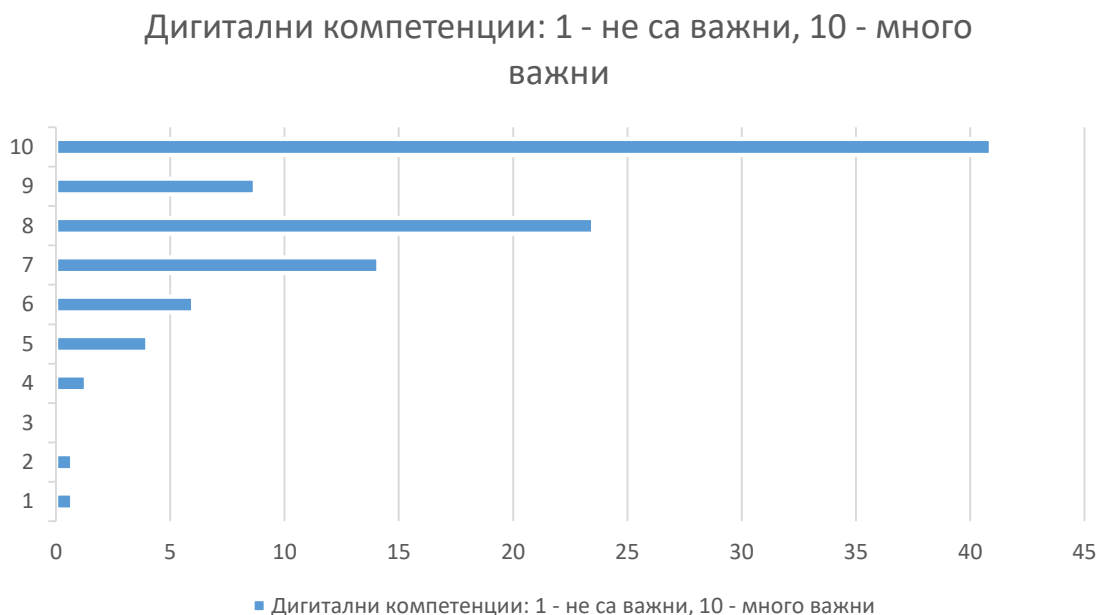


Fig. 5. Importance of digital knowledge

Table 6. Frequency analysis – „importance of digital knowledge“

| Importance |                |           |         |               |                    |
|------------|----------------|-----------|---------|---------------|--------------------|
|            |                | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid      | Not at all     | 1         | ,7      | ,7            | ,7                 |
|            | 2,00           | 1         | ,7      | ,7            | 1,3                |
|            | 4,00           | 2         | 1,3     | 1,3           | 2,7                |
|            | 5,00           | 6         | 4,0     | 4,0           | 6,7                |
|            | 6,00           | 9         | 6,0     | 6,0           | 12,8               |
|            | 7,00           | 21        | 14,1    | 14,1          | 26,8               |
|            | 8,00           | 35        | 23,5    | 23,5          | 50,3               |
|            | 9,00           | 13        | 8,7     | 8,7           | 59,1               |
|            | Very important | 61        | 40,9    | 40,9          | 100,0              |
|            | Total          | 149       | 100,0   | 100,0         |                    |

- It was important for us to establish the attitude of the coaches about the importance of digital competencies, for the successful conduct of their work. The

largest percentage of respondents - 40.9%, choose the answer "Very important", which corresponds to the highest degree of the ten-point system we use. Those who answered 1 - "Not important" and those up to grade 7, make up 26.8% of all respondents. The remaining 73.2% are distributed in 8 - 23.5%, 9 - 8.7% and 10 - 40.9%. We can say that the majority of football professionals definitely believe that they need to have digital skills and competencies in order to successfully cope with their profession.

- Based on the digital skills shown in the last survey, we decided to test the experience of coaches with similar to our products - different types of software for input and processing of information related to coaching. Those who are familiar with such products make up over 80% (80.6) of all respondents. We also see a division in terms of their use - 40.3% know and use similar products, and another 40.3% know about such, but do not use them in their work. The remaining 19.4% do not know such forms of software and accordingly have not used such in their daily activities.

- The basis of our product is its use on mobile digital devices such as tablets or smartphones. In this regard, we decided to check the readiness of football professionals to use the product in this way. Quite logically, almost all respondents - 96.6% prefer to have mobile access to information that they enter and process. At a time when smartphones are an integral part of human life, as well as the specifics of coaching, we can safely say that this would be the easiest and most accessible way to provide information services to this type of profession. Only 3.4% or exactly 5 respondents said they would not take advantage of such a mobile version of their coaching diary.

- After reviewing the currently available similar products, we came to the conclusion that they are mass-produced in English or another foreign language. The Bulgarian language versions are too few and insufficiently functional. That is why it was important for us to check the preferences of football professionals regarding the

language of working with the digital diary. Quite logically, 73.2% of the native coaches want to work with Bulgarian, despite their declared knowledge of foreign languages from the previous survey. For 18.8% of the respondents it does not matter what language they will work in, and 8.1% express a preference for it to be a foreign language (English or other). We consider it necessary to support the native practice with a product that is completely facilitated in terms of understanding, which is why we focused on developing an application entirely in Bulgarian.

### **3. Questionnaire 3 - analysis of the readiness of the coaches to use the coach's diary.**

In order to check the extent to which the digital coaching diary successfully supports the work of Bulgarian football coaches, we created a special questionnaire (Appendix 3). It was filled by a total of 18 football coaches from the school of PFC Levski Sofia, a total of twice - just before they were introduced to the product and immediately after the end of the autumn half-season of the sports competition 2019/2020.

In conducting this final study, we made the following null hypothesis - the use of the digital coaching diary would support the work of coaches in organizing and managing the training process by reducing the time to enter information, increase the amount of information processed and more successful preparation of information. statistics for the training process.

To test the validity of the null hypothesis or whether we would reject it, we compiled a questionnaire, which a group of coaches filled out twice in half a year - before getting acquainted with our product and after the end of the sports half-season, after using the Digital Coaching diary in his work.

The questionnaire consists of questions, the answers to which provide information about the time required to complete information, the amount of information processed, the preparation of statistics for the training process, etc.

### 3.1. Frequency analysis of the answers from Survey 3 - first and second research

Frequency analysis - one-dimensional distribution

We considered the distribution of some of the variables from the first and second conduct of the final inquiry - survey 3.

- Time required to fill in information

Table 7. Frequency analysis – time spent typing information

| необходимо време |                  | Frequency | Percent | Valid Percent | Cumulative Percent |
|------------------|------------------|-----------|---------|---------------|--------------------|
| Valid            | около два часа   | 4         | 28,6    | 28,6          | 28,6               |
|                  | около час и пол. | 4         | 28,6    | 28,6          | 57,1               |
|                  | около час        | 4         | 28,6    | 28,6          | 85,7               |
|                  | около пол. час   | 2         | 14,3    | 14,3          | 100,0              |
|                  | Total            | 14        | 100,0   | 100,0         |                    |

Table 8. Frequency analysis – time spent typing information

| необходимо време 2 |                | Frequency | Percent | Valid Percent | Cumulative Percent |
|--------------------|----------------|-----------|---------|---------------|--------------------|
| Valid              | около час      | 4         | 28,6    | 28,6          | 28,6               |
|                    | около пол. час | 10        | 71,4    | 71,4          | 100,0              |
|                    | Total          | 14        | 100,0   | 100,0         |                    |

We see the distribution of answers regarding the time required to enter information before and after using the digital diary. At the beginning of four of all subjects (28.6%) it takes an hour, an hour and a half and even two hours. Only two of the coaches (14.3%) cope with their tasks in about 30 minutes.

In the second survey we noticed a different distribution with a tendency to reduce the time required for the same activity - four people (28.6%) use about an hour, and ten (71.4%) manage in about 30 minutes.

- Volume of processed information

Таблица 9. Честотен анализ – „обем въведена информация“

| обем информация |                  | Frequency | Percent | Valid Percent | Cumulative Percent |
|-----------------|------------------|-----------|---------|---------------|--------------------|
| Valid           | по-малката част  | 2         | 14,3    | 14,3          | 14,3               |
|                 | наполовина       | 1         | 7,1     | 7,1           | 21,4               |
|                 | по-голямата част | 6         | 42,9    | 42,9          | 64,3               |
|                 | цялата           | 5         | 35,7    | 35,7          | 100,0              |
|                 | Total            | 14        | 100,0   | 100,0         |                    |

Таблица 10. Честотен анализ – „обем въведена информация“ крайно

| обем информация 2 |                  | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------------------|------------------|-----------|---------|---------------|--------------------|
| Valid             | по-голямата част | 2         | 14,3    | 14,3          | 14,3               |
|                   | цялата           | 12        | 85,7    | 85,7          | 100,0              |
|                   | Total            | 14        | 100,0   | 100,0         |                    |

As for the amount of information that football professionals manage to process in their time, we see that in the first survey there are cases in which the coach fails to enter everything he needs - the "smaller part" (14.3%). ) and “half” (7.1%). In the re-study, after using the digital diary, we see both the lack of the above cases and a serious increase in the percentage of coaches who are able to process all the necessary information (85.7%).

- Successful preparation of statistics from the training process

Table 11. Frequency analysis – „statistics“

| статистика |                    | Frequency | Percent | Valid Percent | Cumulative Percent |
|------------|--------------------|-----------|---------|---------------|--------------------|
| Valid      | по-скоро неуспешно | 1         | 7,1     | 7,1           | 7,1                |
|            | не мога да преценя | 9         | 64,3    | 64,3          | 71,4               |
|            | по-скоро успешно   | 4         | 28,6    | 28,6          | 100,0              |
|            | Total              | 14        | 100,0   | 100,0         |                    |

Таблица 12. Frequency analysis – „statistics“

| статистика 2 |                  | Frequency | Percent | Valid Percent | Cumulative Percent |
|--------------|------------------|-----------|---------|---------------|--------------------|
| Valid        | по-скоро успешно | 3         | 21,4    | 21,4          | 21,4               |
|              | много успешно    | 11        | 78,6    | 78,6          | 100,0              |
|              | Total            | 14        | 100,0   | 100,0         |                    |

### 3.2. Analysis of the statistical significance of the differences - Student's t-test

Regarding the preparation of the necessary statistics for monitoring the training and competition process of football players, in the initial survey a significant percentage of coaches feel uncertain about this indicator - "I can not judge" - 64.3%. None of them thinks that they are doing "very successfully" - 0%. In the repeated answers, we see again a tendency to improve the work of sports professionals, after they define their work on this basis as "very successful" - 78.6%. There are no opinions of coaches who believe that they do not cope with this activity.

For more convenient analysis of the indicators, we converted the answers to each question into numerical values as follows:

Table 13. Digital analogues of the answers from Surveys 3 and 4

| Q 1                  |   | Q 2                |   | Q 3                |   |
|----------------------|---|--------------------|---|--------------------|---|
| около два часа       | 1 | никаква            | 1 | никога             | 1 |
| около час и половина | 2 | по-малката част    | 2 | почти никога       | 2 |
| около час            | 3 | наполовина         | 3 | само за определени | 3 |
| около пол. час       | 4 | по-голямата част   | 4 | за повечето        | 4 |
| по-малко от пол. час | 5 | цялата             | 5 | за всяко занимание | 5 |
| Q 4                  |   | Q 5                |   | Q 6                |   |
| неуспешно            | 1 | никога             | 1 | не                 | 1 |
| по-скоро неуспешно   | 2 | почти никога       | 2 | по-скоро не        | 2 |
| не мога да преценя   | 3 | само за определени | 3 | не мога да преценя | 3 |
| по-скоро успешно     | 4 | за повечето        | 4 | по-скоро да        | 4 |
| много успешно        | 5 | за всяко занимание | 5 | да                 | 5 |

Presented in numerical values, we compiled an analysis of Student's t-test for dependent samples for the first and second conduct of Survey 3, respectively.

The results are presented in Table 14:

Table 14. Dependent samples T-test

| Paired Samples Test |  |                    |                   |                       |  |        |        |    |                    |
|---------------------|--|--------------------|-------------------|-----------------------|--|--------|--------|----|--------------------|
|                     |  | Paired Differences |                   |                       |  |        | t      | df | Sig.<br>(2-tailed) |
|                     |  | Mean               | Std.<br>Deviation | Std.<br>Error<br>Mean | 95%<br>Confidence<br>Interval of the<br>Difference |        |        |    |                    |
|                     |  |                    |                   |                       | Lower  | Upper  |        |    |                    |
| Pair 1              | необходимо_време -<br>необходимо_време_2                   | -1,429             | 1,089             | ,291                  | -2,058   | -,800  | -4,907 | 13 | ,000               |
| Pair 2              | обем_информация -<br>обем_информация_2                     | -,857              | 1,027             | ,275                  | -1,450   | -,264  | -3,122 | 13 | ,008               |
| Pair 3              | анализ - анализ_2  | -,214              | ,893              | ,239                  | -,730  | ,301   | -,898  | 13 | ,385               |
| Pair 4              | статистика - статистика_2                                  | -1,571             | ,646              | ,173                  | -1,945   | -1,198 | -9,099 | 13 | ,000               |
| Pair 5              | устройство_за_чертане -<br>устройство_за_чертане_2         | -,429              | ,852              | ,228                  | -,920  | ,063   | -1,883 | 13 | ,082               |
| Pair 6              | диг_устройства_помагат_ли -<br>диг устройства помагат ли 2 | -1,357             | ,745              | ,199                  | -1,787   | -,927  | -6,817 | 13 | ,000               |

From the analysis, we can determine the level of significance of the differences in the answers between the first and the second question as very high, at odds. of significance, 05. We see an exception in indicators 3 and 5 - how often do you analyze and do you use a digital drawing device, where we do not have the required level of statistical significance (.385 at  $t = .898$  and .082 at  $t = -1.883$ ). We believe that the lack of significance in the difference in responses between these two indicators is due to the high correlation of responses "before" and "after" - in other words, we have great similarity in the responses from the two surveys, which suggests that the opinion of coaches has changed with respect to these two criteria (Table 15).

Correlation in the responses from the initial and final survey

Table 15.

| Paired Samples Correlations |   | N  | Correlation | Sig. |
|-----------------------------|---|----|-------------|------|
| Pair 1                      | необходимо_време & необходимо_време_2                   | 14 | ,175        | ,549 |
| Pair 2                      | обем_информация & обем_информация_2                     | 14 | ,204        | ,484 |
| Pair 3                      | анализ & анализ_2                                       | 14 | ,681        | ,007 |
| Pair 4                      | статистика & статистика_2                               | 14 | ,201        | ,492 |
| Pair 5                      | устройство_за_чертане & устройство_за_чертане_2         | 14 | ,504        | ,066 |
| Pair 6                      | диг_устройства_помагат_ли & диг_устройства_помагат_ли_2 | 14 | -,251       | ,386 |

### 3.3. Wilcoxon Signed Ranks Test

Using a survey to test the null hypothesis, we consider it necessary to use a statistical method inherent in the analysis of this type of study. To determine the statistical significance of the difference in the answers given by football coaches and to verify the validity of the null hypothesis, we used a statistical method based on the Wilcoxon Signed Ranks Test, widely used in the analysis of surveys. This would also corroborate the information from the comparative analysis, in order to maximize the accuracy of the data obtained.

Results of the analysis of Wilcoxon Signed Ranks Test - table 16.

Таблица 16. Wilcoxon Signed Ranks Test

| Test Statistics <sup>b</sup> |                     |                          |                    |                            |                      |                        |
|------------------------------|---------------------|--------------------------|--------------------|----------------------------|----------------------|------------------------|
|                              | Време<br>Време_2    | Обем_инфо<br>Обем_инфо_2 | Анализ<br>Анализ_2 | Статистика<br>Статистика_2 | Чертане<br>Чертане_2 | Диг_у-ва<br>Диг_у-ва_2 |
| Z                            | -2,987 <sup>a</sup> | -2,640 <sup>a</sup>      | -,905 <sup>a</sup> | -3,372 <sup>a</sup>        | -1,890 <sup>a</sup>  | -3,153 <sup>a</sup>    |
| Asymp. Sig. (2-tailed)       | ,003                | ,008                     | ,366               | ,001                       | ,059                 | ,002                   |

We can say that the information from the comparative analysis of the answers of the respondents is confirmed. According to the main indicators "Time for entering information", "Volume of processed information" and "Compilation of statistics for training activities" we see very high levels of statistical significance - respectively (.003) at Z -2.99; (.008) at Z -2.64 and (.001) at Z -3.37. The coaches' opinions on the indicators "How often do you analyze your activity?" And "Do you use a digital drawing device?" Do not change significantly between the two questions. At the indicator for drawing the training aids, we have a high Z coefficient (-1,890), at a lower statistical significance - (, 059). With these results, we can say that the high levels of use of digital devices have persisted and still show a significant increase in terms of this indicator.

The benchmark "Do you think digital devices support coaching?" Shows a significant increase in the view that digital products help football professionals. We observe a very high level of statistical significance (.002) at coefficient. W -3.15. Judging by this, we can definitely say that the opinion of coaches is changing in favor of the use of digital products in their daily activities.

## **Chapter IV. Conclusions, recommendations and contributions from the dissertation**

**The main scientific conclusions made by the dissertation are divided into three areas, arising from the objectives of the study:**

### ***Regarding digitalization and the attitudes of specialists:***

1. The sports-pedagogical process marks a significant development in terms of digitalization of its activities, which inevitably leads to the need to develop innovations in the field. That is why we have formed an opinion that sports in general and football in particular need quality staff to meet this change in the organization of work.

2. Bulgarian football specialists declare good experience and a significant degree of understanding of the work with and about digital products related to the training and competition process of football players. The answers from the surveys clearly outline the framework of the knowledge and skills of the coaches in the aspects of the digital spectrum related to the conduct and organization of the sports-competitive process. It is on this framework that one can skillfully work towards improving the quality of the work of specialists related to the management and organization of the process, in the conditions of the growing digitalization of both modern football and sports in general.

3. In view of the growing need for new and specially adapted IT products in the field of sports (and in particular football), football professionals declare a strong desire to work in unison with the changing working conditions. In the answers to the survey, aimed at studying their attitudes to work with digital products for the organization of the activity, specialists of all ages and professional experience express a desire and readiness to jump in the technological support of the sports-

competitive process. It is this fact that is fundamental for the development of IT products in the field of football training.

***Regarding the creation of a digital coaching diary:***

1. In view of the results of the research, we believe that the digital coaching diary prepared by us fully meets the specifics of football practice, after referring to the opinions and requirements of football professionals themselves - an important element that contributes to product quality.
2. The balance of the opinions of the football coaches leads us to the conclusion that the digital coaching diary created on the basis of their opinions significantly supports the coaching activity, in the part of their work related to the organization and management of the training process and the significant reduction. the time for entering and processing the information - feedback from the training and competition days.

***Regarding the work of the coaches with the diary:***

1. The contingent of football specialists of DYUS at PFC Levski Sofia, studied in the final phase of the experiment, uses the digital product easily and without difficulties in the organization of their work.
2. In conclusion from the opinions of specialists and analyzing their answers through specialized mathematical and statistical methods, we can conclude that the diary significantly supports their work, in the part that relates to the organization of the work process.

Based on the conclusions thus formed, we have compiled a number of recommendations, logically following the analysis of the experiment:

### ***Recommendations:***

1. The practical experience gained from this study makes it possible to focus work on improving the performance of football coaches through digital products. Therefore, we recommend research and development of different types of products based on the data from the current experiment.
2. To use the current model of methodological sequence in the preparation of such products and, above all, to take into account the opinions of experts on the specifics of the activity in their preparation. For example, we recommend using the logical sequence of the methodology of the present study.
3. We strongly recommend to implement and use the digital coaching diary in the work of football specialists, both from DYUS and in the profile of professional football teams, as this would contribute to the optimization of their work.

At the very end of the study we presented the contributions of the current dissertation in the development of scientific and methodological ideas on the problem of research:

### ***Contributions:***

1. The issue of the growing digitalization in the field of sports and in particular the football game, about the digital products and their influence on the activity of the workers in the field of sports is considered and described in detail.
2. For the first time in the Bulgarian practice the attitude of the football specialists regarding the digitalization in their sphere of activity has been successfully studied, as well as regarding the use of digital products related to the organization and control of the performed work concerning the sports-pedagogical process.

3. A model methodology has been developed for the development of a digital product to support the organization and management of the work process, based on the opinions and views of sports professionals on the specifics of their activities.
4. A digital coaching diary has been successfully developed and put into operation, designed in unison with the ideas and requirements of the football specialists regarding the specifics and needs of their activity in organization and management of the sports-competitive process.

## PUBLICATIONS

1. Димитрова К., В. Цветков – Анкетно проучване на дигиталните компетенции на български треньори по футбол. Годишник на НСА Васил Левски 2020, Е спринт ООД, Т. 1, 320-328, ISSN 2682-9908.

2. Цветков В., К. Димитрова – Изследване на профила на мобилността за 16-годишни футболисти по време на 90-минутни официални срещи посредством GPS система. Годишник на НСА Васил Левски 2020, Е спринт ООД, Т.1, 64-71, ISSN 2682-9908.

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Kamelia is a long-time fencing competitor, and later actively participated in the organization of a number of national and international events at the Bulgarian Fencing Federation. She is part of the representative fencing team at the Fencing Club at the National Sports Academy, participating in a number of national championships and tournaments. Winner of the NSA Fencing Club Cup in the annual NSA Open tournament.

She is the author of five scientific publications, both in the framework of his dissertation and before that in the previous scientific fields.

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