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Chapter 23

Moving Volleyball Coaches Education Online: A Case Study



Josef Buchner and Martin Plessl

Abstract Traditionally, volleyball coaches' education has been conducted physically in the gym and classroom, but due to Covid-19 and the actions needed to contain the pandemic, that was no longer possible in the spring of 2020. Instead of canceling the already planned course we decided to move the course online. The development process was guided by the question if we can teach volleyball-specific skills online. As a result, we designed a fully online blended learning course with a problem-centered approach and authentic video-based tasks. A total of 23 prospective coaches took part in the course. Skills acquisition was measured using a pretest-posttest design revealing a large effect of our design on skills acquisition. Additionally, we surveyed participants attitudes towards the learning design. The results show that prospective coaches were satisfied with the design and perceived the online learning course as useful for volleyball coaches' education. Based on the results, we can recommend the combination of videos and interactive content to provide authentic problem-centered tasks to facilitate skills online in volleyball coaches' education.

1 Introduction and Problem Statement

With the worldwide outbreak of the Coronavirus (Covid-19) at the beginning of 2020, national governments enacted restrictions to prevent the further spread of the virus in the population. Among others, social distancing regulations were imposed leading to a shutdown of places where many people meet each other in everyday life, including all levels of educational institutions (Bond, 2020; Delcker & Ifenthaler, 2021). These restrictions directly affected the profession of the second author, who is responsible for the education of future volleyball and beach volleyball coaches in Austria. The education program traditionally consists of face-to-face

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lectures, classroom activities and live demonstrations of volleyball-specific techniques and exercises in a gym. Typically, between 15 and 25 prospective coaches meet at a sports resort for several days with a training supervisor. The participants learn about the theoretical basics of volleyball and practice coaching skills that are important for improving the performance of their future players. Such skills include choosing and developing drills, giving instructions, demonstrating techniques, observing athletes, and giving corrective feedback (German Olympic Sports Confederation, 2017; Giannousi et al., 2016). The skill to see and correct mistakes of movements, for example of a certain volleyball technique, is mentioned by several authors as the main skill a volleyball coach should have. To foster the ability of correcting movements prospective coaches' need both knowledge about the right execution of the technique and the possibility to observe players during the performance. As a result, volleyball coaches can compare the observed movement with the desired one and provide helpful feedback and advice to improve the technique (Friedrich, 2014; Grgantov et al., 2013; Meyndt et al., 2010). In the Austrian volleyball coaches' education program, the promotion of this main skill is a central part in the curriculum. The prospective coaches traditionally practice the skill by observing each other while playing or carrying out drills.

In the spring of 2020, it became obvious that the already planned course for future beach volleyball coaches cannot take place in its usual form in the summer, as an end of the shutdown in Austria was not expected. Therefore, a decision had to be made: Cancel the course or develop a solution and use the pandemic as an opportunity for exploring new ways how to teach volleyball-specific knowledge and skills. As this chapter proves, the second author chose the latter and contacted the first author, who is a researcher in learning design and technology and a former graduate of the coaches' program. Together, we developed a fully online blended learning design that includes both the teaching of knowledge and the training of the practical skill of correcting movements. In the next section we present our learning design and the theoretical considerations that guided the design process. Afterwards, we report the results of the evaluation of the first implementation including learning performance and attitudes towards the design. The chapter concludes with lessons learned and practical implications for online learning in the field of sports education.

2 Designing for Online Volleyball Coaches Education

2.1 Didactical Analysis

In the first phase of the design process, we conducted a didactical analysis including the learners, the circumstances, and the learning objectives (Kerres, 2018). Regarding the learners, our group of participants consists of volleyball players that are interested in working as coaches. They already participated in other volleyball education courses, so they are familiar with the traditional concept including the

face-to-face lectures and the on-court training together in a group of other prospective coaches. Online learning was not included in these previous courses. As a consequence, we concluded that is important to design for social aspects in our course and to provide enough support on how to use the online learning platform. The circumstances are heavily influenced by the valid Covid-19 restrictions in Austria in the spring and summer of 2020: Meetings with more than two people were prohibited and sports resorts as well as beach volleyball courts were closed. As in many other countries, the only way to continue teaching was to move classes online (Bozkurt et al., 2020; Hodges et al., 2020). The learning objectives of the volleyball coaches' course contain knowledge and skills about certain volleyball techniques. In a first step, the prospective coaches learn in a lecture about the key aspects of the techniques, the ideal movement sequences and typical mistakes athletes make in the execution of the techniques. After the lecture, the training supervisor demonstrates ideal and non-ideal executions of the techniques. The participants replicate the ideal movements, observe each other, and provide corrections if they identify wrong movements. The challenge when moving a course with such learning objectives online is to provide learning tasks that also allow the improvement of the described practical skills.

2.2 Didactical Decisions

The results of our didactical analysis guided the further development of the instructional design leading to the following decisions:

First, only a fully online format was an option due to the circumstances caused by the Coronavirus and the restrictions to lower its spread.

Second, the inclusion of social aspects was important for us. On the one hand, to give the prospective coaches the feeling of belonging to a group of learners that share a passion, namely, to support athletes to become better volleyball players. On the other hand, peer-collaboration can promote deep learning by discussing and reflecting the content from multiple perspectives (Merrill, 2018). As a consequence, we decided to design a fully online blended learning course. Traditionally, blended learning is defined as a mix of online learning and face-to-face meetings (Kerres & Witt, 2003). However, in times of institutional shutdowns new solutions how to realize the blend are needed. We chose to conduct synchronous face-to-face meetings using web conferencing software and asynchronous learning phases realized through the learning platform.

Third, to address the learning objectives of the coaches' volleyball course, we designed a problem-centered instructional sequence with authentic learning tasks. According to Merrill (2018), problem-centered learning works best when a *Tell-Show-Do* sequence of learning events is used. *Tell* is necessary to present information of the topic, in our case knowledge about the techniques and the desired movement. *Show* is the demonstration of examples, in our case examples of ideal and non-ideal movement execution of the techniques. *Do* refers to the application of

the knowledge, in our case observing movements, comparing them with the ideal execution and correcting them if necessary. For the *Do*-learning event we designed authentic tasks (Teräs & Kartoğlu, 2017) by providing complex and real-life examples of beach volleyball movement executions.

2.3 *Instructional Media*


The implementation of our design was realized using the *Moodle* learning platform with the *H5P* plugin for creating interactive content. For the real-life examples of beach volleyball movements, we used videos and pictures that were recorded during tournaments or practices for analysis purposes by the second author. The videos were edited to allow the learners observing the movements several times and in slow motion. We combined the videos with the interactive content types offered by *H5P*, for example reflective questions or drag-and-drop elements. In addition, *H5P* allows adding text to the videos, what we used to scaffold the *Do*-phase. Figure 23.1 shows an example of a video-based authentic task. Interested parties can also enroll in a trial course and work on the tasks themselves. To do so, open the website t1p.de/volleyball and register as a guest (gray button on the right). After that you have access to the content. For the *Tell* and *Show* learning events, the trainer supervisor used previously developed presentation slides, videos, and image sequences.

2.4 *Final Instructional Design for Online Volleyball Coaches' Education*


Based on the design process outlined in the above sections, we present in Table 23.1 the final learning design for online volleyball coaches' education. This design incorporates the approved traditional stages of acquiring volleyball-specific skills and supplements them with additional opportunities to train these skills in greater depth. This last aspect is found in the asynchronous online phase, in which all participants practice the skill of analyzing and correcting movements over several weeks with the help of the video-based tasks. In the traditional format, intensive individual training of this skill is less pronounced due to a lack of time.


3 **Implementation and Evaluation**

The design was implemented in summer 2020 for the first time. A total of 23 prospective coaches were registered. They agreed to take part in the newly designed online blended learning format.




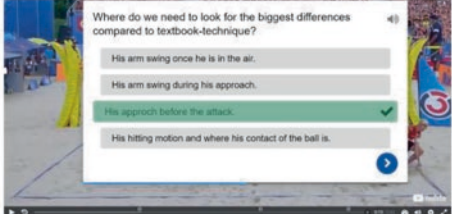
Start:
Learners see the movement of the athlete two to three times.





First task:
Remember the step sequence for a right-handed player.





Second task:
Compare the knowledge on the ideal movement with the observed execution.

Fig. 23.1 Example of a video-based task; here the execution of the jumping and spiking technique

The evaluation of our design is guided by two questions:

First, does the design work to facilitate the skill of seeing and correcting mistakes in technique executions?

To investigate this question, we applied a pretest-posttest research design. To assess the skill performance, we again used the *H5P* plugin that enables automatic storage of the user’s behavior while completing the video-based tasks. For example, after completing the two tasks in Fig. 23.1 participants receive a score that is saved and can be anonymously downloaded later for research purposes. In the pretest, the participants worked out four video tasks that were provided after attending the *Moodle* platform for the first time (preparation phase). The posttest was applied after the asynchronous online learning phase and consists of the four tasks from the pretest and four totally new video tasks. A maximum of ten points could be scored.

Table 23.1 Final instructional design for online volleyball coaches' education

Preparation phase		<ul style="list-style-type: none"> • Mail-invitation: Attend the <i>Moodle</i> platform • Getting-to-know the platform
↓		
Blended online phase	1. Tell & show	<ul style="list-style-type: none"> • Synchronous web meeting • Trainer supervisor presents knowledge and examples of the volleyball techniques
	2. Do	<ul style="list-style-type: none"> • Asynchronous and individual processing of the video-based tasks available at the <i>Moodle</i> platform
	3. Reflection with peer-collaboration	<ul style="list-style-type: none"> • Synchronous web meeting • Asking and clarifying questions • Presentation of the results • Reflection on the problem-solving process • Discussion about the tasks and the solutions • Feedback
↓		
Asynchronous online phase	Do (optional)	<ul style="list-style-type: none"> • Self-directed online skills training for 3 weeks • New video-tasks each week • Synchronous web meeting to clarify open questions on the tasks
↓		
Graduation phase (<i>After Covid-19 restrictions</i>)	Do	<ul style="list-style-type: none"> • Live practice session • On-court • Demonstrating knowledge and skills

Second, what are the prospective coaches' attitudes towards the blended learning design as a possible solution to learn volleyball-specific knowledge and skills?

To explore the second question, we used three scales from the *Technology Usage Inventory* developed by Kothgassner et al. (2013): *Usability*, for example “Using the platform was easy” (Cronbach’s alpha = 0.91, two items); *Usefulness*, for example “The content and tasks in the learning platform are useful for the training of future volleyball coaches” (Cronbach’s alpha = 0.68, three items), and *Intention To Use*, for example “I would like to continue using the content and tasks in the learning platform” (Cronbach’s alpha = 0.69, three items). The participants answered the items on a Likert-scale ranging from 1 = do not agree to 7 = fully agree. Additionally, we asked the participants to rate their satisfaction with the learning design on a scale ranging from 1 = not satisfied to 7 = very satisfied. Furthermore, the prospective coaches gave us written feedback. Data on the learners' attitudes towards the learning design was collected after the asynchronous online phase through online questionnaires provided via the *Moodle* platform.

3.1 Data Analysis

To analyze the effect of the design on skills training we downloaded the data generated automatically by the *H5P* plugin. All participants processed all video-based tasks, however, data from four participants was missing. Hence, to answer question one we included the data of 19 participants.

The posttest-questionnaires regarding the attitudes towards the learning design were answered completely by 22 participants. All calculations were carried out in SPSS 27.

3.2 Results

The descriptive statistics for the assessed variables are presented in Table 23.2.

As shown in Table 23.2, all participants improved their performance on the video-based tasks on the posttest ($M = 8.18$, $SD = 0.88$) compared to the scorings in the pretest ($M = 6.69$, $SD = 1.88$). A Wilcoxon signed-rank test revealed that this difference is statistically significant, and the explored effect size is large: $Mdn_{pre} = 6.50$, $Mdn_{post} = 8.20$, $z = -2.82$, $p = 0.01$, $d = 1.70$. Based on these results we conclude that our learning design was effective in the facilitation of one of the main skills volleyball coaches need. After the training the participants were better able to see and correct movement executions of volleyball techniques.

As also visible in Table 23.2, the participants report high positive attitudes towards the implemented learning design. The usability of the platform and the handling of the video-based tasks was perceived as easy ($M = 6.82$, $SD = 0.48$), the usefulness of the design to learn volleyball-specific knowledge and skills was rated as very beneficial ($M = 6.60$, $SD = 0.60$) and the intention to use the materials further is high ($M = 6.42$, $SD = 0.82$). Overall, the participants were very satisfied with the course ($M = 6.68$, $SD = 0.72$).

Table 23.2 Descriptive statistics for the assessed variables

Variable	<i>M</i>	<i>SD</i>
Skills performance ($N = 19$)		
Pretest	6.69	1.88
Posttest	8.18	0.88
Attitudes ($N = 22$)		
Usability	6.82	0.48
Usefulness	6.60	0.60
Intention to use	6.42	0.82
Satisfaction	6.68	0.72

The positive attitude towards the learning design is also reflected in the written feedback. A total of 11 participants used this opportunity to share their thoughts with us. For example, one participant wrote that “*I find it easier to analyze my players. The course helped me a lot.*” and another one concluded that “*The videos provide a good comparison for illustrating movement actions.*”. One participant pointed out that during the asynchronous online phase the optional face-to-face meeting was not enough support to solve all video tasks successfully. Two participants reported technical issues with the *H5P* videos, for example choices or comments were not displayed.

4 Conclusion and Lessons Learned

In this chapter, we report the development process and the instructional design for a fully online blended learning format for volleyball coaches’ education. Our design proved to be an effective instructional strategy to facilitate the skill of seeing and correcting movement executions of volleyball-specific techniques. In the literature, this skill has been called a main skill to promote in volleyball coaches’ education (Meyndt et al., 2010). Before the course, we were confronted with some skeptical voices, doubting the effectiveness of online learning for skills acquisition. As demonstrated in this chapter, using a problem-centered approach with a *Tell-Show-Do* learning sequence is suitable to do so, even in sports coaches’ education. A major factor in the success of the learning design are the video-based tasks. These provided the learners with authentic game situations with real athletes enhanced through practical tasks of seeing and correcting movement executions. Also, in other sports education programs the combination of video sequences and interactive content might help to facilitate specific skills. Additionally, the video-based tasks serve as a method to assess learning performance. This is of great significance when researchers are interested in learning outcomes beyond knowledge, for example the facilitation of practical skills like demonstrated in this chapter.

Furthermore, it is important to note that our design is a blended learning format in which the prospective coaches were accompanied in their facilitation of the skill by virtual face-to-face meetings. One great advantage of our design over the traditional one is that all prospective coaches can practice seeing and correcting. In previous courses, only two to three participants could actively engage in this task due the limited time and the number of participants. As a result, the video-based tasks will be used in future courses, independent of Covid-19, as an important extension of the traditional approach.

The participants were highly satisfied with the learning design and convinced of the usefulness for volleyball coaches’ education. However, we learned that acquiring a complex skill like seeing and correcting movement executions needs more support from the trainer supervisor. As a consequence, we recommend including face-to-face meetings in an asynchronous online phase as an optional opportunity to

reflect on the tasks more often. From a technical perspective, we recommend testing the *H5P* content before the start of the course and regularly during the course.

To conclude, it is possible to teach practical skills in a fully online blended learning course in volleyball coaches' education. The *Tell-Show-Do* learning sequence with video-based tasks is a recommendable approach to promote coaching skills. The small number of participants is a limitation of the study. Future research should test if the approach works for other coaching skills in volleyball or other sports, including higher numbers of participants.

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