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Learning Soccer in Elementary School: Using Teaching Games for Understanding and Digital Media

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In this study, a digitally supported sports game teaching process for elementary school was investigated using the teaching approach, Teaching Games for Understanding (TGfU). The investigation was carried out to investigate the research question: How do elementary school students experience and interpret the use of digital media when teaching soccer using the TGfU approach in physical education (PE) lessons? To this end, a teaching unit on soccer was carried out in four classes in fourth grade according to the TGfU teaching method. During the unit, the 9- and 10-year-old students recorded one another with an app and tagged certain game situations according to predefined criteria. The sequences (approximately 8 s) were discussed together during the reflection phases. Following the lesson, 65 guided interviews were conducted with students. The research approach focuses on the perspectives of the students involved. Data collection and analysis were based on grounded theory methodology. The interviews revealed very ambivalent perspectives on the use of the app. Overall, the students were very reflective about the use of the app. The digital medium was interpreted as an aid in the learning process and was clearly less important than playing the game itself. The children reported many attempts to implement the tactical ideas discussed together in the reflection phases in the subsequent game. However, many students who described themselves as good soccer players saw the app's use as rather superfluous. The misuse of the film option was also interesting: The students often used this option as a video assistance referee, for example, to quickly clarify disputed situations. The results, thus, show extremely pragmatic handling of the digital tool by the students.

Keywords: teaching games for understanding, tagging, videocatch, tablets, cooperative learning, physical education, video feedback, app

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INTRODUCTION

Due to the heterogeneity of the learners, the teaching of sports games in physical education (PE) in elementary school is very challenging. It is important to design lessons that are equally appealing to all students. In the context of teaching soccer, in particular, different aspects need to be considered. For example, in Germany, this sports game is much more popular with boys than with girls. In addition, many students have previous experience from sports clubs, where training is done in homogeneous groups and separated by sex (Süßenbach, 2004). Children are also confronted with other goals, such as preparing for competitions and optimizing techniques and tactics. Therefore,

they have very clear ideas about how sports game instruction, and also PE, should be conducted (Kirk, 2013; Stolz and Pill, 2014). These ideas and expectations that children bring to PE lessons are also shaped by the commercial portrayal of soccer in the media.

To stage a soccer game that is joyful for all students despite these challenges, appropriate didactic-methodological approaches are necessary. To address this issue, a teaching unit on soccer was developed and implemented. The present study used the method Teaching Games for Understanding (TGfU; Bunker and Thorpe, 1982), which, for 40 years, has been well-known in the discussion about the teaching of sports games. This was combined with the use of digital media, a very current topic of discussion in sports pedagogy.

Teaching Games for Understanding

The TGfU is a game-based teaching approach first introduced in 1982 as a contrast to traditional technology learning (Bunker and Thorpe, 1982). Didactic rationales and methodological choices in this approach focus on the development of game skills. The goal is to train students to be flexible, creative, and responsible when playing their sports game (Hopper et al., 2009). Students are, thus, expected to take responsibility for their learning process, which can be encouraged through reflective conversations, which are an integral part of TGfU (Kirk, 2013; Stolz and Pill, 2014). In these conversations, students are intensively confronted with the essential content and need to deal with it cognitively. This can involve, for example, concrete game situations and student challenges and possible solutions. This leads to practice phases in such areas as tactical skills and technical skills. These skills are then applied in the game.

Originally, Bunker and Thorpe (1982) proposed a six-phase model to guide PE teachers through the different steps of this teaching approach. Mitchell et al. (2006) condensed these six phases into three phases (**Figure 1**) to make them more manageable for the specific situation of PE lessons. In the first phase, students are presented with a modified form of the game (e.g., with the reduced number of players and field size) to adapt it to the level of the students so that they can experience the tactical challenges typical of the game. In the second phase, the teacher interrupts the game to discuss with the students' possible courses of action and any tactical difficulties that arise. Afterward, the respective tactical focus can be tested in more depth with a form of exercise. In the third phase, there is usually another game phase, where the focus is on sport-specific technique, which ideally results from talking to the students about the first two phases (Mitchell et al., 2006).

Digital Media in Elementary School Physical Education

The use of digital media can be helpful in the learning cycle of TGfU. Because digital media are part of children's everyday lives, elementary schools must also address this, including in PE (Greve et al., 2022). However, the use of digital media in elementary school PE is a topic that has yet been explored in research (Greve et al., 2022). The PE lessons offer special opportunities and challenges in this regard that teachers need to be aware of. The use of digital media has implications for certain pedagogical and didactic goals in PE (Armour et al., 2016). This is because PE is unique in that the learning processes of students are directly visible, which is not the case in other subjects (Koekoek et al., 2018). Using video feedback, for instance, the play and movement sequences can be recorded by students and subsequently viewed. This includes, for example, the possibility of correcting a movement action. However, the option of visualization also has the potential for problems, such as shame and stigmatization, and bullying when discussing such scenes (Goodyear, 2017). This student's handling of images of themselves and others promotes the self-determined handling of media and media products that arise when working with digital media. This can also be seen as an important learning goal in PE lessons (Goodyear, 2017; Goodyear et al., 2019). Therefore, a critical and constructive discussion about the possibilities of using digital media in PE is needed (Casey et al., 2017), especially in the elementary school context. In elementary school, in particular, the use of digital media must not only be seen in the context of the movement experience, but the social interaction of young students, which is changing, must also be considered (Greve et al., 2022). Likewise, students may bring sport-specific competencies to the discussion without engaging in sports themselves. However, this should not happen in such a way that children hide behind the camera in the long run (Goodyear et al., 2014). While this also creates new opportunities for children to engage in PE, self-actualization of play and movement must also be part of the lesson. Digital media should support, not replace, the movement, play, and sports in PE lessons. Teachers must keep this in mind when staging PE.

The presented study was conducted with the following research question in mind: How do elementary school students experience and interpret the use of digital media when teaching soccer using the TGfU approach in PE lessons?

MATERIALS AND METHODS

Intervention and Participants

For this purpose, a team of scientists and PE teachers designed a teaching concept for elementary school (Diekhoff et al., 2022), where soccer is taught according to the TGfU method. Small-sided games (3 vs. 3) were played in the game phases. These are particularly suitable for soccer in a heterogeneous learning group so that all children can have many ball contacts and feel a sense of success, thus having a joyful playing experience (Aguiar et al., 2012). In the unit, different tactical elements (e.g., "calling for the ball and positioning," "recognizing free spaces," and "securing ball dominance cooperatively") are addressed. The students are repeatedly confronted with similar tactical situations in various forms of the game that they are asked to solve in a playful manner. In addition to the typical interleaved play, practice, and reflection phases in the lesson sequence, the teaching concept included the use of tablets and the Videocatch app (preliminary version). With the help of the app, the students were able to make video recordings while playing the games.

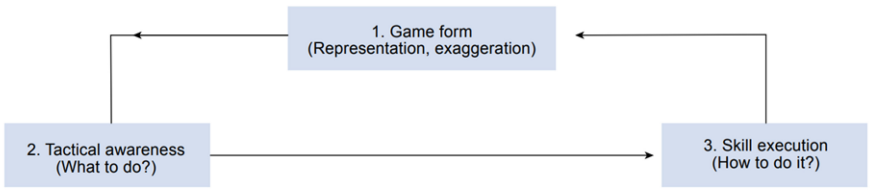

FIGURE 1 | A learning cycle according to the TGfU (Mitchell et al., 2006, p. 13).

The games were played three on three on a small field: Four children were on a team, and each child on a team took a turn filming the action on the sidelines using a tablet. For certain game situations (e.g., when a goal was scored), the filmmakers tagged (Koekoek et al., 2018) the situation by pressing a virtual button on the display. Tagged situations are automatically saved in the app as short clips (8-s long) and can be retrieved and categorized accordingly. Short clips can be played back and stopped in slow motion, and virtual drawings are also possible in the clip. The buttons were named in a discussion between a teacher and students. Typical terms such as "goal," "target shot," "foul," and "save" were chosen. The game phases were repeatedly interrupted so that the individual teams could watch various short clips. The tagged game scenes were then selected by the children and discussed and reflected on together.

This teaching concept was implemented in four classes of Grade 4. Each of the four classes had 24 students (9- and 10-year-olds), mostly with boys and girls in roughly equal numbers. In all classes, three lessons of 90 min each were conducted according to the concept. Before these three lessons, a media education lesson was held where the students tried out the app, and topics such as the right to one's own image were discussed.

Data Collection and Analysis

To answer the research question, a qualitative research design with an explorative character was developed. Data collection and analysis followed grounded theory methodology (GTM; Corbin and Strauss, 2008), where the subjective views of the children were in the center of interest, social actions and processes were analyzed and compared, a lack of theoretical elaboration of the topic was identified, and work was done close to everyday life. For the development and evaluation of teaching units, the student perspective is of enormous importance, as the increasingly digitalized life-worlds of children offer important explanatory approaches for researchers and teachers (Bodsworth and Goodyear, 2017). Therefore, after the lessons described above, guided interviews were conducted with various children in the classes. Sixty-five students (32 girls and 33 boys) were interviewed. The interviews lasted between 9 and 32 min. The interview guide started with an open-ended narrative about the previous lesson and then addressed the children's play behavior, the use of the app during the play phases, and the design of the reflection phases with the help of the app. The interviews were then transcribed and were open-and-axial-coded based on GTM. The data were coded collaboratively by the researchers and the results were discussed. This circular process in terms of GTM is still ongoing at the present time of this study. The phenomena and action patterns presented in the following results section will be further differentiated by a second data collection, by further axial coding, with selective coding being done if necessary. The first goal is the development of a category system that is further differentiated and concretized. Whether the final step of selective coding will be possible and necessary cannot be answered conclusively at the current stage of the study.

RESULTS

During the reconstruction of the students' views on the described lessons, different phenomenon areas became visible that are described in the following. At this stage of the investigation, the phenomena had not yet been finally described as categories. Therefore, the naming of the listed phenomenon areas was done in a different way, for example, as *in vivo* codes or as descriptive labels.

Playing Successfully Is Important: Own Scoring and Team Play as Key Success Factor

In the open narrative occasions, the children reported their experiences of success in the games in detail. These were obviously very important for the children. They described feelings of happiness due to their team winning games, balls saved by the keeper, and their own scoring successes. The children were able to recount in detail the game sequences and situations in which they themselves scored goals. In addition, the children emphasized very clearly that you need to play together as a team to win a game and for all children to have fun. This is also clear in the following interview excerpt.

> *I: Yes. And can you remember moments in the sports project [this refers to the teaching unit; authors' note] that you particularly enjoyed, which you found particularly great? #00:00:38-1#*
>
> *S11w: Yes, so I thought it was great that I was always happy when I scored a goal. That was/Yes, and that we also played so well together and passed. That is what I liked about it. #00:00:59-5#*

The girl answers the question about positive moments with her personal experiences of success. The joy about her own scored goal is probably the most important emotion, which is not surprising. This is followed by the statement

about being "together" in the game and about passing the ball. This refers to teamwork, which obviously enabled a positive game experience. This implies that all players in the game had frequent contact with the ball and, thus, actively participated in the game. The opposite was a self-willed player who, for example, tried to decide the game on his own through long dribbles. The girl clearly prefers the cooperative way of playing soccer, which she obviously experienced through the staging of lessons according to TGfU with small-sided games.

Using the App to Optimize the Game and Watch Beautiful Goals

The moments of success were also important for the children in terms of using the app. They reported watching and enjoying beautiful goals on the tablet and learning something through using it.

I: And what was that like for you, seeing the other kids on the recording? #00:10:11-6#

S2m: I thought it was cool how they dribbled or how they scored. I learned something from them, too. Yes. #00:10:21-3#

The boy reports, from his point of view, spectacular actions that he saw in the video. He likewise reports an interpreted learning gain from watching the action. The copying of soccer-specific technical moves can be appropriately reinforced through the video option. The children learned from one another here, which is positive. The app also served to optimize a tactical play, as the next example shows.

S37m: We watched it, and, then, we always talked about what could be improved or what was already good. #00:03:59-8#

I: And what were the things that you discussed, for example, that could be improved or what were the things that were good. #00:04:06-6#

S37m: Well, in the end, that maybe, we should pass more often, because, in one scene, we saw that one of us was going on his own the whole time and suddenly lost the ball. There was one of us still had to save a scoring attempt or, of course, get the ball here from the opponents and that then took time to make a goal. #00:04:32-9#

The boy reports on processes that were bad in the game from his point of view. He describes the lack of teamwork, which was not crowned with success. He had discussed this with his team based on the video. It becomes clear that the phenomena described (scoring goals, not going it alone, playing together) have a great influence on the video-based reflection.

Video-Influenced Conflict Solving

The children reported conflicts during the games; that a conflict arising is normal, especially in elementary school PE classes. It is interesting that the children also used the app to resolve these conflicts. The children then acted as video referees. Disputed scenes were watched on the tablet and were mostly fouls (or alleged fouls) and attempts on goals that did not clearly find their target.

I: Yes, okay. And you watched that again as well? #00:25:15-9#

S35m: Exactly, we also looked at it again. And then A. said, "That was a foul." Then I said, "Yes, that was a foul. I actually wanted to get the ball". And then those from my team said, "You're going to get a free kick now," and then that was cleared up. #00:25:32-4#

The boy describes how, with the help of the app, the disputed situation was resolved. He comes to the realization that he made a foul by watching the scene on the video. Several components are interesting about this phenomenon. The children used the digital medium for a process they themselves were familiar with from the media: the use of the video assistant referee. This shows the obvious influence on children of soccer in the media. However, the decision in this case—foul or no foul—was made cooperatively between the members of the two teams playing against each other. This shows the positive options that the app offers.

DISCUSSION

The phenomena shown occurred in PE lessons, where soccer was taught according to TGfU with the help of digital media. However, the focus in some of the phenomena shown was on the use of digital media rather than the playing of the game itself. The preliminary results indicate that the children valued and demanded cooperative team play. Likewise, it was important to the children that both individuals and their teams have a sense of success in the game. This was assessed based on cooperative team play. Likewise, it was important to the children that all teammates were actively involved in the game. The goals of a game-centered implementation of a teaching unit on soccer based on TGfU (Hopper et al., 2009) with small-sided games (Aguiar et al., 2012) become visible here. Playing also seemed to be clearly more important for the children than using the app and the tablet; a pragmatic view seemed to prevail here. The digital medium can be seen as an aid in the learning process. The influence of the mediatized sporting world also becomes clear here [e.g., knowledge of the video assistant referee (VAR)]. In addition, the children reported on conversations about game procedures, about ideas for tactical improvements in the next game, and about the attempts to implement these, showing the possibility for cooperative video feedback among the students.

It is also interesting to note that the possibility of watching successful scenes in itself evoked joy. Here, the recurrent visibility of actions in PE lessons (Koekoek et al., 2018) offers new possibilities for shaping children's learning processes. The results showed several examples of children's cooperative actions using the app. The combination of game-centered teaching based on TGfU and the use of the app seemed to generate productive possibilities for learning sports games in the classroom. This refers not only to the technical and tactical components of the soccer game but also to solving conflicts and assessing one's own actions. New didactic-methodological and pedagogical challenges and possibilities arise when dealing with images of oneself and classmates (Goodyear et al., 2019) that need to

be considered by elementary school teachers, especially in the context of a game that is often very demanding emotionally.

Future Directions

Since the study was designed following the GTM research paradigm, a second data collection is planned. Here, the teaching concept will be implemented in two additional fourth-grade classes. The results available, so far, cannot be considered valid yet, and the identified phenomena still overlap at many points. Thus, they are not distinct, which is the reason for the second data collection. Following this data collection, all data will be further analyzed. The new data will be open-coded, and then, data from all data collections will be axial-coded, with the aim of being able to form a final category system after this step. Likewise, the decision will then be made about whether the process of selective coding is possible and necessary.

DATA AVAILABILITY STATEMENT

The datasets presented in this article are not readily available because the parents of the children interviewed were assured that the data would not be shared. Requests to access the datasets should be directed to SC, steffen.greve@leuphana.de.

ETHICS STATEMENT

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

AUTHOR CONTRIBUTIONS

SG, HD, and JS contributed to conception and design of the study. HD organized the database. SG and HD performed the analysis. SG wrote the first draft of the manuscript. All authors contributed to manuscript revision, read, and approved the submitted version.

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