

## 'I can show you; here's the video' – video-supported student-led debates in game-based approaches

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### ABSTRACT

The utilization of devices like iPads for video feedback has become increasingly popular and is now acknowledged as a valuable asset in PE. Nevertheless, existing research and implementation of video feedback have been primarily concentrating on particular skills. This study explores students' perceptions of video-supported debates in game-based approaches. For this purpose, a football unit was taught using the instructional approach of Teaching Games for Understanding. Students were presented with football in the context of three-versus-three games and one child on each team tagged game situations with an app. The research approach involved qualitative methods, specifically using grounded theory methodology (Corbin & Strauss, 2008), to analyse semi-structured interviews conducted with students. Based on the interview analysis, the phenomena that students experienced in visualised student-led debates were classified as: 1) beneficial video analysis (with the subcategories of visible assessment of game performance and facilitating images for the discussion of (certain) game situations), and 2) collaboratively developed game plans (with the subcategories of strategic tactical considerations and efficient technical hints). The outcomes of the study reveal beneficial impacts on student conversations and interactions. The findings suggest that collectively watching videos can have a positive impact on debates of ideas, even at the primary school level.

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## Introduction

The utilisation of digital technologies in the context of physical education (PE) is being discussed worldwide (Mackenbrock & Kleinert, 2023; Sargent & Calderón, 2021). Empirical studies have been increasingly addressing this topic, resulting in a growing number investigating the integration of digital technology in PE. Specifically, areas such as health, cooperative learning, gamification and wearable technologies, in conjunction with digital technologies, are being examined (Jastrow et al., 2022). Despite the rising popularity of digital innovations in schools, researchers agree that digital devices and mobile applications should not be used for their own sake. Moreover, educational decisions should not be dependent on digital technologies. Instead, digital technologies should support the development of high-quality PE (Bodsworth & Goodyear, 2017; Casey et al., 2017).

The integration of digital applications in PE is increasingly being demanded by national curricula, for example in Germany. In Germany, the Standing Conference of the Ministers of Education and Cultural Affairs (Kultusministerkonferenz, KMK) has made the promotion of media literacy a cross-cutting task for all subjects and school levels through its position paper *Education in the Digital World* (KMK, 2016). This resolution accords primary schools a special responsibility in fostering diverse aspects of media literacy and should provide a suitable foundation for the development of other competencies. Children and adolescents should be enabled to engage in appropriate, self-determined, creative and socially responsible digital technology use (Tulodziecki, 2015). The use of tools such as iPads for video feedback has gained

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popularity and is being increasingly recognised as a valuable tool in supporting learning in PE (Goodyear, 2020; Laughlin et al., 2019). However, current research and practice in video feedback have been limited, mainly focusing on specific skills (Atatekin & Kara, 2024; Potdevin et al., 2018). To fully realise the potential of new video feedback applications (e.g. tagging applications) in supporting learning, it is necessary to gain a broader understanding of their pedagogical implications and value (Casey et al., 2017). Specifically, in the context of learning in sports games. Further research is needed to comprehend how video feedback can extend beyond skill analysis and effectively support learning within the realm of sport games.

Invasion games like football are highly popular in PE, but teaching them poses challenges, especially in diverse student groups, which require tailored approaches to accommodate different abilities, motivations and expectations (Neuber, 2019). Designing a learning environment where all players can have positive experiences, enhance their skills, and deepen their understanding of game tactics and strategies is a challenging endeavour (Lebed, 2022). Models-based practices that contain similar principles are called game-based approaches (GBA). These pedagogies are in general learner-centered. In most game-based approaches, the central focus is on tactical understanding and decision making (Koekoek et al., 2023). The instructional approach of teaching games for understanding (TGfU) provides a comprehensive pedagogical framework for teaching games. While the TGfU model continues to emerge at the international level, it has thus far received limited attention in Germany (Greve et al., 2023). The approach of TGfU focuses on explicit tactical instruction by analysing in-game situations and blending gameplay with practice (Bunker & Thorpe, 1982). Engaging in reflective discussions, students are guided towards a heightened comprehension of essential instructional content and play an active role in shaping their own learning journey. In the context of PE, teachers utilise questioning and discussions as crucial pedagogical tools to enhance students' tactical understanding in games (Harvey & Light, 2015). By prompting students to engage in such dialogues, they gain a heightened awareness of game dynamics, including changes in players' positions on the field, and learn to make informed decisions regarding suitable actions. Furthermore, this approach fosters active involvement and increased engagement among students during games (Harvey et al., 2016). Several studies have corroborated the effectiveness of this model, indicating that questioning and stimulating discussions about strategies and intentions during time-outs particularly appeal to students' tactical thinking (Almond, 2015; Richard & Wallian, 2005).

There is currently limited knowledge from research regarding students' perspectives on video-supported reflections in game-based football lessons. Therefore, this study aims to evaluate students' perspectives of the integration of video-based debates facilitated by the students themselves. The study seeks to acquire insights into their viewpoints while employing video-supported debates within the setting of football in primary school PE.

### ***TGFU, debate of ideas and video tagging***

The original six-level instructional model of TGfU (Bunker & Thorpe, 1982) emphasised the comprehension of tactics and gameplay over traditional technique acquisition (Thorpe et al., 1984). Rooted in social constructivism, TGfU considers students to be active participants in a holistic learning environment, with teachers assuming the role of facilitators (Lee, 2003). The approach prioritises the relationship between the game and learners, and it begins with players engaging in small-sided games to grasp the core concepts of the game (Firmana et al., 2023). These small-sided games are adapted to the players' skill levels (Thorpe, 1990). The primary focus of any didactic-methodological approach within TGfU is on enhancing decision-making skills during actual gameplay, promoting flexibility, creativity and responsibility in students' performance (Bunker & Thorpe, 1982; Hopper et al., 2009). Educators' central tasks include selecting appropriate game situations, asking relevant questions and utilising suitable forms of practice. Recent research on TGfU in PE emphasizes its implementation and effects across different educational levels. Several studies have investigated TGfU's influence on cognitive abilities, particularly decision-making skills (Rinaldo et al., 2021). The approach has been applied to specific sports, such as basketball, to enhance tactical understanding and skills like man-to-man marking and shooting (Widowati et al., 2022; Sandy et al., 2023). Research designs include quantitative, qualitative, and mixed methods, with most interventions being short-term (Barba-Martín et al., 2020). TGfU has shown promise in improving

motor and cognitive learning, including tactical aspects and game development (Barba-Martín et al., 2020). The model's focus on game-based learning and tactical problem-solving is perceived as more engaging for students compared to traditional drill-based methods (Sandy et al., 2023).

Students engage in the explicit teaching of tactical skills through the reflection of game situations and a spiral linking of games and practice. To develop student ownership of the learning process, reflective conversations are employed, from which learners become aware of essential lesson content and actively participate in shaping their learning (Kirk, 2013; Stolz & Pill, 2014). This process occurs by students reflecting on their own game situations and enables them to recognise different challenges and cognitively devise potential solutions such as game plans that can be physically tested in the game. Student discussions can be supported by the implementation of a 'debate of ideas' approach, whereby students engage in strategic discussions and exchange ideas in between game phases (Gréhaigne et al., 2005; Storey & Butler, 2010). Previous research has established that such debates can enhance students' tactical understanding and decision-making (Darnis & Lafont, 2015). Gréhaigne et al. (2001) created the debates of ideas approach to align with a pedagogy that emphasises social interactions among students during the learning process. According to Harvey and Jarrett (2014), these interactions can raise students' performance to a heightened conscious level and facilitate the collective negotiation and mutual comprehension of action rules (e.g. game plans). Furthermore, this approach allows students to discover suitable tactical solutions themselves, rather than being provided with predefined optimal solutions by the teacher. As each student may have different capabilities in action execution (i.e. ability to achieve meaningful outcomes), there is no single best solution or strategic decision to be taught by the teacher. Debate of ideas focuses on these individual differences and promotes interactive discussions to exchange tactical solutions. The approach aligns with social constructivist learning methods, where the teacher facilitates group learning (Richard & Wallian, 2005). The social environment of debates of ideas nurtures students' ability to perceive the opportunities presented by game situations and encourages their autonomy in decision-making (Harvey & Light, 2015). Implementing the debates of ideas approach in PE provides numerous opportunities for PE teachers to promote discussions and interactions on tactical matters before, after or between games. However, researchers have not extensively explored the mutual influence of students on each other's perceptions and performances during gameplay following a debate of ideas, leaving the specific unfolding of these sessions largely unclear.

The reflection phases can be enhanced digitally, allowing students to record game phases and subsequently review them together. However, viewing one's own game footage presents both opportunities and challenges. Incorporating digital technology, particularly video feedback, has been the subject of several studies (in addition to exergaming), with findings suggesting significant improvements in motoric capabilities and skills (Nowels & Hewit, 2018; Rekek et al., 2019; Chang et al., 2020). Nevertheless, the primary focus of these studies was on the learning outcome concerning motoric skills, with the research carried out in secondary schools. Conversely, O'Loughlin et al. (2013) explored the impact on children's learning experience using digital video in primary PE. The results suggest that digital video can play a vital role in primary PE by providing immediate visual feedback and facilitating authentic assessments. The findings emphasize the need for careful planning to optimize the benefits of technology in enhancing the overall learning experience. To integrate digital technology into game-based PE, it is crucial that there is immediate accessibility to video recordings relevant to the intended learning focus. Koekoek et al. (2018) developed a tagging application for this purpose. Tagging involves marking significant events in video recordings in real time (unlike technologies where key events are selected after the recording is complete, i.e. after the class ends). By using tagging, teachers can quickly access video footage that is relevant for sharing with students. Additionally, students themselves can utilise tagging feature to identify key events during gameplay. This approach supports the development of students' ability to recognise crucial moments in games (Koekoek et al., 2018). As teachers often need to attend to various situations and student groups simultaneously, assigning focused tagging tasks to students enables them to work independently during lessons without direct supervision. Koekoek et al. (2019) demonstrated that video tagging positively impacted students' agreement in assessing tactical situations during debates of ideas in a basketball setting. While video tags stimulated student-led discussions, the accuracy of observations did not improve. Subsequent studies, such as Mckeever and Runceanu (2022), highlighted the potential of video tagging to influence reflection processes but

emphasized the importance of effective organization and decisions on what to tag. Diekhoff and Greve (2023) explored students' perspectives on the 'camera child' role in game-based football lessons with video tagging, revealing ambivalent views. Managing role allocation is crucial to avoid exclusionary tendencies, and teachers must address conflicts and ensure a fair distribution of camera time.

Further research is required to understand how this digital tool can be effectively integrated into teaching and learning processes. In addition, limited research has been found that surveyed this particular topic in primary schools. Building upon this research approach, this article focuses on video tagging within a football unit based on the instructional approach of TGfU and aims to explore students' perspectives on video-supported debates.

## **Methodological approach**

This study provided an overview of the perspectives of fourth-grade students on the utilisation of video tagging in a GBA within PE. Its objective was to assess students' perceptions of the implementation of video tagging during student-led debates. The study intended to gain insights into their perspective when employing video-supported debates in primary school PE. The researchers collaborated with three primary school teachers to develop a football unit based on TGfU principles incorporating video tagging (Diekhoff & Greve, 2023; Greve et al., 2022). The students' viewpoint was given central importance in the planning and evaluation process, since children's increasingly digitalised lives provide valuable insights for researchers and teachers (Bodsworth & Goodyear, 2017). The research approach followed the principles of grounded theory (GTM; Corbin & Strauss, 2008). GTM was chosen for this study due to its strength in systematically analysing qualitative data and generating insights grounded in empirical evidence. GTM is particularly effective for exploring complex phenomena where existing theories may not fully capture the nuances of the data (Miller, 2015; Shank, 2006). In the context of analysing interviews about video tagging in football, GTM facilitated a detailed examination of the participants' experiences and perspectives. Qualitative methods were employed to capture the complex details of phenomena such as feelings, thought processes and emotions (Mey & Mruck, 2009; Strauss & Corbin, 2010). Additionally, GTM was chosen due to the lack of theoretical elaboration on the topic (Jastrow et al., 2022).

### ***The unit: football with a GBA and video tagging***

A football unit consisting of three 90-min lessons based on TGfU principles was conducted in six grade 4 classes and involved a total of 131 students. Before the football unit, a 90-min media education lesson addressed topics related to pedagogical media, including the right to one's image and rules for handling video recordings created in class. The Videocatch app (AppBakkers, 2022) was introduced, and students were given the opportunity to collect ideas for tags and to test the app, which was used to capture video recordings during gameplay. The children filmed the game and tagged specific situations, such as goals, by pressing an icon on the screen. The app saved recordings 5 sec before and 3 sec after the icon was pressed. Only scenes that were tagged were saved.

The objective of the lessons was to enhance students' game performance and develop a better understanding of tactical situations as well as to encourage cooperation and communication among the students. From a media pedagogical perspective, the aim was to teach students how to use the tablet and the app effectively and to foster appropriate and self-determined handling of the video sequences. Most importantly, the study focused on the students' perspectives of the video-supported debates conducted between the game phases. The study did not assess the students' game performance or how their understanding tactical situations developed.

Following the TGfU approach, the students were divided into teams of four and engaged in three-versus-three small-sided games. One child on each team took on the role of filming. After the game phase, the teams watched their recorded game scenes together. The number of recorded scenes varied among the teams, with some teams watching and analysing only one scene and others watching several different videos. During this phase, the children analysed the videos, highlighting what had worked well and discussing what they could do better or differently in the next game. They could watch the videos in slow motion, pause them and even draw on them to indicate specific running or passing routes. The teacher

provided guidance to individual teams, addressed questions and distributed reflection cards with prompts to stimulate conversations among the students (e.g. 'What do I need to do in order to receive a pass?'). After the reflection phase, the students played another game.

### **Data collection and analysis**

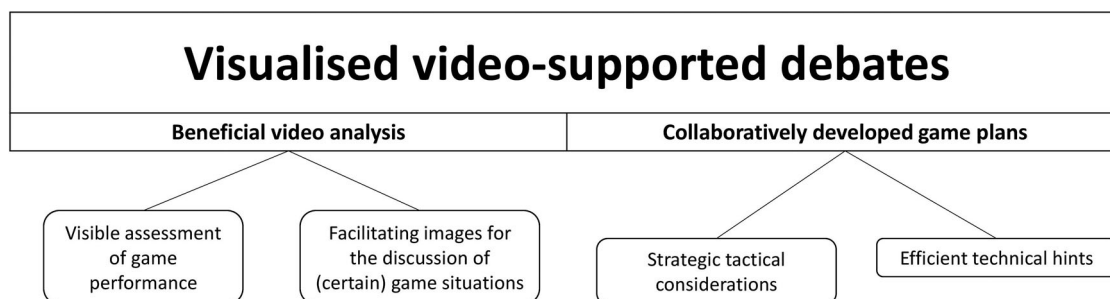
A total of 65 semi-structured interviews were conducted with the students (32 girls, 33 boys) after the first teaching unit, which involved four grade 4 classes. Seven months later, after a second teaching session with two additional classes, 39 children were interviewed (17 girls, 22 boys). The interviews took place immediately after each lesson and lasted between 9 and 36 min. The interview guide focused on individual students' perceptions and experiences of using tablets in PE, covering topics such as device handling, being filmed, viewing game situations and engaging in team discussions. The interview questions were developed based on the research objectives and a thorough literature review. During the interviews the interview guide was used to ensure a consistent and comprehensive exploration of the research topics. The guide served as a flexible framework, allowing the researchers to follow a structured sequence of questions while remaining open to follow-up questions based on the children's responses. The interviews started with general, open-ended questions to make the students comfortable and gradually moved to more specific questions about their experiences. The guide helped maintain focus on key areas such as their general experiences in PE, interactions with digital media, and reflections on the use of the iPad. This approach ensured that all relevant topics were covered while allowing for the natural flow of conversation and the emergence of unanticipated insights. The study had received approval from the school authorities, and the children participated with parental consent.

Adhering to GTM, the researchers critically reflected on the research process, which resulted in modifications to the interview guide and improved access to the field (Strauss & Corbin, 2010). A total of 104 interviews were audio-recorded, transcribed and analysed using the coding methods of GTM. While selective coding was not employed, focusing on open and axial coding allowed for a thorough categorization and organization of the data, providing rich insights into the themes and patterns relevant to the study. This approach was aligned with the study's objective of developing a comprehensive understanding of the data (Berg & Milmeister, 2008; Vollstedt & Rezat, 2019). The study employed open and axial coding methods while not elaborating on the selective coding method. The research focus did not involve developing an object-centred theory. The initial phase of open coding involved breaking down the data into discrete parts and assigning initial codes. During this stage, all possible categories and concepts were identified, and each segment of data was labelled with a code that describes its content. Following open coding, axial coding was used to reassemble the data in a way that clarifies relationships between categories (Corbin & Strauss, 2008). This phase focused on identifying connections among the initial codes and grouping them into categories that explain how various elements of the data relate to each other. Throughout this process, constant comparison was used to compare data segments with codes and categories, ensuring that the theory developed is grounded in the data and accurately reflects the participants' experiences (Mey & Mruck, 2009). The analysis of the interview transcripts identified and described phenomena and patterns of action relevant to the research question. Thus, the coding methods that had been used appeared to be sufficient for the topic analysis (Corbin & Strauss, 2008). After the initial round of data collection, a preliminary classification was created (Greve et al., 2022). From the second round of data collection, the most promising phenomena and categories were further differentiated. The researchers coded the data together and extensively discussed the results to reach consensus.

### **Results**

The analysis of the interviews allowed the categorisation of the phenomena in visualised video supported debates experienced by the students. These observations were classified into two main categories, as illustrated in Figure 1: (1) beneficial video analysis and (2) collaboratively developed game plans, each of which consisted of two subcategories (Figure 1). In the following, when presenting each subcategory, a general description of the phenomenon is provided, accompanied by representative excerpts





**Figure 1.** The classification of visualised video-supported debates.

from the interviews. These interview excerpts serve to illustrate the phenomena and are complemented by detailed interpretations by the researchers. Consequently, the explanations are transparent and can be verified. The interpretations are based on the collected data as well as relevant theoretical and empirical findings. The incorporation of tablets in the PE process, specifically in the context of children's football games and subsequent reflection on game phases, served as a functional component.

### ***Beneficial video analysis***

In the interviews, it became evident that the students perceived the app as an aid. They reported comparing their own playing performance with that of their peers when watching themselves in videos. In this process, the (game) performance of the children was assessed based on the failures (e.g. misplaced passes, losing the ball) or successful actions (e.g. goals) they collectively watched in the videos. Furthermore, the interviews revealed that the app helped the students engage in post-game reflections about gameplay situations. These phenomena, extracted from the interviews with the children, are described in the following two subcategories (Figure 1).

#### ***Visible assessment of game performance***

During the interviews, the students reported perceiving certain situations in the games differently to how they appeared in the later video recordings. In the games, the children primarily focused on themselves scoring goals and resolving complex gameplay situations. However, during the subsequent video discussions, they also became aware of the performance of other children in addition to their own gameplay. For instance, S37 reported:

Then you could also see, when I made mistakes, I didn't just see myself making a mistake, I could see someone else as well, and then I didn't feel so lonely, knowing that I wasn't the only one still making mistakes.

This highlights that the child juxtaposed their own mistakes in the game with those of others. The student emphasised that it was comforting to see that others also made mistakes. By having the opportunity to observe others making mistakes, the child felt less isolated and experienced a certain relief. The realisation that mistakes are part of the learning process and that other players are also working on them can help students feel less pressure and create a positive learning atmosphere. Overall, the quote demonstrates that the child felt relieved by having the ability to observe themselves and others making mistakes. They recognised that mistakes are part of the process of learning and improving and that they were not alone in their challenges.

In the interviews, the students frequently discussed their own or others' errors that had become visible in the video. The video medium facilitated the perception and discussion of unsuccessful gameplay actions during collective reflection. However, it was not only unsuccessful scenes that were the focus of the students. They also reported successful gameplay scenes in the video that they watched together and enjoyed. Among these scenes, the children particularly mentioned goals scored by themselves or their team, as reported by S30:

Well, of course, we were always happy when F. or C. scored a goal; we were always happy about that. If a child made a mistake, I didn't secretly make fun of them because I understood, because I've made mistakes too. I understood that. Everyone makes mistakes at some point.

This highlights that the child had a positive attitude towards the game and their fellow students. They expressed joy when other children scored goals. The student also emphasised that they did not secretly laugh at the mistakes of other children, since they themselves understood that mistakes can happen. They showed understanding that everyone occasionally makes mistakes and that it is part of the learning process. The quote demonstrates an empathetic and compassionate attitude towards the mistakes of others, indicating that the child valued a positive learning environment where mistakes were accepted and not negatively judged. From the videos, the students clearly recognised that everyone made mistakes. Even the most skilled students had unsuccessful actions captured in the video sequences. As a result, the students reported engaging in conversations about how to improve their gameplay and minimise errors.

From the interviews, it became evident that the students spoke appreciatively and respectfully about their own and others' gameplay performance that they had observed. Viewing successful gameplay actions could also contribute to increased self-confidence among individual students. When asked about how it felt to see themselves in the video, S37 responded:

Actually, it is just a really good feeling that they also see that I can do something and that I also see for myself that I can do something.

This highlights the child's positive perception of their own abilities. The student indicated that it was pleasing that other players could recognise that they possessed certain skills. It appears that the child sought recognition and validation from others, leading to an increased sense of self-worth. Overall, the quote demonstrates that the student experienced a positive feeling of satisfaction and pride when both they and others acknowledged their capabilities. This experience can enhance a child's self-confidence, motivation to continue working on their skills and further development in the sport activity. In addition to assessing and comparing their own performances with those of their peers, the children perceived the videos as a supportive tool for collective reflection.

### *Facilitating images for the discussion of (certain) game situations*

The interviews revealed that the students had perceived the viewing of video sequences from the game and the subsequent team reflections as helpful. The students reported that this provided them with a common basis for discussion. The focus was on the specific game situations they had watched, and all team members could contribute their thoughts on that scene. Furthermore, the children mentioned in the interviews that the videos allowed for specific demonstrations, as described by AS26:

It also helped a bit that you could see when someone said, 'You could do that better.' And they would say, 'Yeah, you're telling us that, but you can't show us.' And that's something that could be improved with the app because you could say, 'Well, I can show you, here's the video. You could have done this and that better.' And then you could see it properly, imagine it. Then you could also focus on that. And it was just easier.

The shared viewing of videos facilitated specific improvement suggestions among the students, as is evident from the previous student comment. It highlights that the students were initially sceptical when someone offered advice without being able to demonstrate it themselves. However, by using the app, the children were able to show the video and specifically point out what could have been done better. This allowed the students to visualise the feedback and focus on it, facilitating the learning process and enabling more targeted skill improvement. The ability to see oneself in action and receive clear instructions for improvement helped the students direct their attention better towards the necessary aspects.

Furthermore, the students were able to use the video footage to demonstrate various running or passing routes and highlight the different positioning of their teammates. The drawing tool in the app was sometimes utilised for this purpose, as described by S33:

It facilitates discussing where someone can go. Because you can also draw and sketch where the person could go, that makes it much easier to discuss who can go where. Because, you know, it's my problem; for example, as a field player or goalkeeper, you don't see everything, and you don't see every goal. And then it's also difficult to put it all together in your mind because sometimes you cannot explain things well with words.

This quote demonstrates that the use of visual aids, such as marking and drawing on the videos, facilitates understanding and discussion regarding player positioning. By allowing students to mark and

draw potential player movements, it becomes easier for them to discuss viable running paths. The ability to visually illustrate and communicate supports students in organising their thoughts and providing better explanations. As a result, they can enhance their tactical decision-making and role within the game by leveraging visual cues and engaging in discussions with others.

### ***Collaboratively developed game plans***

In addition to recognising and improving upon errors observed during gameplay and captured in the videos, the students also collaborated in developing shared game plans to be implemented in future matches. These game plans primarily focused on 'strategic tactical considerations', although some interviews also touched upon 'efficient technical hints' (Figure 1).

#### ***Strategic tactical considerations***

The students described in the interviews how they experienced the reflection phases within their team and reconstructed their collective debates. The focus was primarily on offensive actions, such as scoring goals. Several factors that would facilitate goal scoring were identified during the interviews. It became evident that teamwork was regarded as a crucial component for successful and enjoyable play, as stated by S3:

What was good was that we always played together, had fun and always helped each other. If someone was in a tight spot, then the other person—for example, me, L.—would pass the ball to them, and then they could continue playing.

The quote illustrates that the child had a positive experience of playing football and held a positive attitude towards teamwork. It emphasises the significance of unity and support within the team. The fact that they played together and enjoyed themselves suggests that they had a good team atmosphere, with the focus not solely on winning but also on the shared experience and joy of the game. The mention of mutual assistance highlights that the players were willing to help each other in challenging situations. By passing the ball when someone was under pressure, they enabled others to stay in the game and continue playing. This demonstrates that they felt accountable for one another and were willing to support their teammates rather than solely focus on their own accomplishments. Overall, the quote conveys a sense of positive and harmonious team spirit in which the players care for their teammates, collaborate and have fun together. It underscores the importance of solidarity and teamwork in football. Children who tended to play individually were made aware of this by their classmates through the videos and encouraged to pass the ball. AS7, who initially hesitated to pass the ball frequently, described how their team dealt with it:

Um, that was seen a few times in the video, but then we also discussed what we could do better, like making runs into free spaces to create passing options for me.

It became evident that the team actively engaged with the situation. They recognised the importance of finding alternative options for the child to have a supporting player so they could distribute the ball. This indicates that the team made efforts towards better collaboration to improve effectiveness and team spirit. The suggestion to create space and offer oneself as a passing option demonstrates an understanding that football is a team sport where players depend on each other. It shows a willingness to move away from an initial mindset of individual play and actively involve teammates in the game. This quote implies that the child was receptive to feedback and improvements and that the team strived to become more effective together. It emphasises the significance of communication and shared learning to enhance the game and strengthen teamwork.

Creating space in attack and supporting the ball carrier were important components of the game plans that the children developed together. Additionally, they reported attempting to create space through teamwork and exploit opponents' weaknesses. Another aspect mentioned by the students in the interviews was field positioning. When asked about action rules, S20 reported:

Yes, we developed a tactic: one person in goal and the other two on the sides, forming a triangle. That way, we could always play with the goalkeeper and the wingers. It worked out well.



By forming a triangle, they formed a good distribution on the field, enabling better communication and collaboration between the goalkeeper (defender) and the wing players. As a result, they always had passing options both in defence and offence. This demonstrates that the team consciously developed a strategy to cover different areas of the field while maintaining connectivity between players. This quote highlights that the child and their team actively engaged with their positioning on the field to improve their teamwork and gain advantages in the game. It emphasises the importance of tactical thinking, teamwork and strategic positioning in football. Successful defensive actions were also discussed in the interviews. For example, the children talked about how to handle losing the ball, mark players and engage in tackling during the game.

### ***Efficient technical hints***

In the interviews, the students reported on technical elements such as ball control, passing, stopping, dribbling and shooting, which were either performed well during the game or needed improvement. Some children also mentioned in the interviews that they learned tricks from their classmates and attempted to implement them in the following game. Through the use of the videos, the players were able to provide each other with tips on how to improve their techniques. For instance, S29 described a particular scene:

Once, K. from my class, he shot using the toe poke technique, and I mentioned that you can shoot with the outside or inside of the foot, but usually, you don't use the toe poke.

The child's remark that one can shoot with the outside or inside of the foot indicates their understanding of the common shooting techniques in football. It suggests that the child possessed knowledge of various techniques and recognised that the toe poke was not the usual shot. The statement that the toe poke was not normally used suggests that this shooting technique was uncommon or less effective. The child seemed to acknowledge that there were other shooting techniques that allow for better accuracy and power. Overall, this quote demonstrates that the student was familiar with basic shooting techniques and understood that certain techniques in football are more effective than others. It underscores the importance of learning and applying appropriate shooting techniques to succeed in the game.

## **Discussion**

The present study aimed to investigate students' perceptions of video-supported debates in GBAs. The results indicate several positive effects of using digital technology on the students' conversations and interactions. The findings suggest that tagging and watching video sequences can positively influence the discussion phases, even in the context of primary school.

The results showed beneficial video analysis (Figure 1). One of the key benefits observed was transparent and visible assessment of game performance. These findings can help us understand how primary school students interpret their own game performance compared to that of other students. This study demonstrates that students can deal with mistakes and understand that mistakes are a natural part of the learning process. An explanation for this might be the media education lesson that took place prior to the football unit. During this session, shared rules for the video-enhanced debates of ideas were discussed and established. Particular emphasis was placed on addressing the handling of one's own and others' mistakes, as they became visible in the videos. The significance of learning and critical reflection about media becomes evident within this context (KMK, 2016). It seems possible that the children developed awareness that even the most accomplished football players commit errors, fostering an empathetic and compassionate disposition in the context of PE. This empathetic and compassionate attitude is likely to have contributed to the cultivation of a positive learning environment in which mistakes were accepted and not negatively judged. Despite the implementation of a media education lesson prior to the unit, teachers must remain cognisant that managing errors depicted in video recordings can occasionally present challenges for students. Consequently, educators may need to navigate conflicts during phases of reflection and dialogues centred on video sequences (Diekhoff & Greve, 2023). These results are in accord with recent studies that noted the importance of the integration of media and sports pedagogy and emphasised the need to consider both media pedagogical and sports pedagogical

aspects when using tablets in PE (Armour et al., 2016; Greve et al., 2020; Koekoek & Van Hilvoorde, 2018). Furthermore, these findings are consistent with data obtained in a previous study about the importance of social learning (Diekhoff & Greve, 2023). The results of the present study support the idea that the visibility of movement can promote social learning, especially in the (self-)assessment of game performance. According to these data, we can infer that video analysis in GBAs can provide a platform for students to recognise and discuss mistakes as well as to rejoice together over successful game actions, especially goals.

Another important finding is that the videos also facilitated the debates of certain game situations (Figure 1). By watching and analysing video sequences, the students had a common basis for discussion. Similar to this finding, Koekoek et al. (2019) reported that the utilisation of video tagging has the potential to augment students' alignment and concentration with respect to educational objectives within debates of ideas. The students were able to focus on the scenes they watched and share their thoughts on those situations. The videos enabled specific demonstrations, allowing the students to visually show what could have been done better. It can therefore be assumed that this visual feedback can enhance the learning process and direct students' attention towards necessary improvements. The ability to mark and draw on the videos further supported debates on player positioning and running or passing routes. These results may further indicate that visual aids can help students understand and articulate their ideas. However, they also raise the intriguing question of whether video-supported debates of ideas are effective and contribute to enhanced tactical decision-making and role comprehension in the game. Further research is needed to evaluate the impact of video-supported debates of ideas on the tactical knowledge and game performance of students.

In addition to the students perceiving the videos as aids, the study revealed that they collaboratively developed game plans (Figure 1). These debates primarily focused on tactical considerations, such as cooperatively securing possession of the ball and teamwork. The importance of unity and support within the teams emerged as a crucial component for successful and enjoyable play. The videos highlighted the significance of teamwork, encouraging players to assist each other and pass the ball when someone was in a tight spot. It seems possible that these results are due to the implementation of small-sided games involving reduced numbers of players wherein all participants are required to contribute to the achievement of a goal (Aguiar et al., 2012). In instances when a student disengages from active participation in a three-versus-three scenario, the team incurs a disadvantage. The objectives of employing a GBA for the implementation of a football unit, rooted in the TGfU framework (Bunker & Thorpe, 1982) and featuring small-sided games (Firmana et al., 2023), become visible in this context. Another possible explanation for this result is that the tagging objectives were outlined before the game, so that the students knew what to tag in the game. Furthermore, reflection cards with prompts to stimulate conversations among the students were provided by the teacher to direct collective focus towards collaborative dynamics during the debates of ideas. These findings align with the conclusions drawn by Mckeever and Runceanu (2022). The students actively engaged in finding alternative options to support their teammates and improve collaboration. The development of game plans included creating space, exploiting opponents' weaknesses and strategically positioning the players on the field. Tactical thinking and teamwork were emphasised as essential aspects of football. This study supports evidence from previous observations indicating that students actively participate in shaping their learning processes by reflecting on their own game situations (Kirk, 2013; Stolz & Pill, 2014; Storey & Butler, 2010). The students were capable of independently identifying appropriate tactical resolutions, rather than being presented with predetermined optimal solutions by the teacher (Harvey & Jarrett, 2014; Richard & Wallian, 2005). Furthermore, the videos provided technical hints and tips for skill improvement. The students shared knowledge about various techniques and recognised the effectiveness of certain skills over others, such as shooting with the outside or inside of the foot instead of using the toe poke technique. Here, the positive impact of video feedback on sport-specific techniques becomes evident, as has been explored in previous studies (Nowels & Hewit, 2018; Potdevin et al., 2018).

Overall the results broadly support the work of other studies in this area linking digital video with enhanced motivation, feedback and performance in skill learning in PE (O'Loughlin et al., 2013; Reik et al., 2019, Koekoek et al., 2018). The results from the visualised video-supported debates provide some tentative initial evidence that tagging applications can potentially serve as beneficial tools for enhancing

the learning process in sports games for students. These are particularly promising findings. However, in this context, it is crucial that potential challenges are not overlooked. For example, it is incumbent upon teachers to proactively address potential conflicts by engaging students in discussions about conversational rules and handling video sequences during reflection phases. Teachers should remain cognisant that conflicts may arise from viewing video sequences and be prepared to intervene as moderators when necessary (Diekhoff & Greve, 2023). In this emerging field of sports pedagogy, the findings can serve as a foundation for further research to advance and optimize subject-specific didactic concepts. Future studies could explore the perspectives of teachers, examining their views on video tagging in primary school PE. Additionally, the results suggest that developing an appropriate pedagogical framework to integrate video tagging and game activities in PE requires further investigation. Such research could provide a comprehensive understanding of the long-term impacts on students' performance and their acquisition of tactical and technical skills. To achieve these goals, future research could employ longitudinal studies with a pre-test – post-test design to assess students' game performance and the acquisition of tactical and technical skills over time. This approach would offer valuable insights into the long-term effects of video tagging on students' learning outcomes. Furthermore, a mixed-methods approach could be used to evaluate the reflection phases, focusing on aspects such as the methodological setup, teachers' guidelines, students' tagging behaviour, and their discussions. By combining quantitative and qualitative data, this approach would provide a comprehensive evaluation of the pedagogical strategies employed and their effectiveness in enhancing students' tactical decision-making and role comprehension in games. This integrated approach will help in developing effective strategies for incorporating video tagging in PE, ensuring that the insights gained are both robust and practically relevant.

### **Strengths and limitations**

The strengths of this exploratory study, employing GTM with open and axial coding, are notable and contribute significantly to the research field. The exploratory nature of the study enabled a thorough examination of students' experiences and perspectives, uncovering previously unknown aspects and relationships. The open and axial coding processes facilitated the development of two contextually relevant categorization systems, enriching the existing knowledge base in this area. The direct derivation of categories and insights from students' statements ensures that the findings are highly relevant and applicable in practical settings, supporting the formulation of actionable recommendations for educational approaches. Additionally, the comprehensive data collection through 104 semi-structured interviews provided a robust and detailed dataset, enhancing the validity and reliability of the categorization systems and achieving theoretical saturation. The subject-oriented focus of the GTM allowed for an authentic capture and analysis of the students' subjective experiences and meanings. Overall, the study's exploratory design and methodological rigor offer a deep, flexible, and practically relevant analysis, grounded in established theoretical and methodological frameworks. However, approaches of this kind carry with them various well-known limitations. The interpretation of the data can be strongly influenced by the subjective experiences and beliefs of the researchers. Despite methodological rigour, a certain degree of subjectivity remains unavoidable in this study. Although the researchers obtained a large sample during data collection, the generalisability of the results may be limited. Whilst the research provides important insights into a new field of research, the application to other settings remains unclear. Furthermore, it should be noted that the results can be strongly influenced by the specific school and classroom context. Other schools, different school types and differently composed classes and learning groups have different dynamics. These conditions could limit the transferability of the results. The same applies to the behaviour and interactions of teachers during PE lessons.

### **Conclusion**

The results of this study indicate that video tagging and collective viewing positively influenced the debates of ideas in football among primary school students. The videos provided transparent assessments of game performance, fostering a positive learning atmosphere and empathy towards mistakes. The visual feedback facilitated discussions on specific game situations, enhancing tactical understanding

and decision-making. The collaborative analysis of videos led to the development of shared action rules and game plans, promoting teamwork and unity. The videos also offered technical hints and tips for skill improvement. In sum, the findings demonstrate that video-supported debates and collective watching of video sequences have valuable benefits for conversations and interactions in football, even at the primary school level. Conclusions drawn from this study should be considered in the context of its exploratory nature. Although the results suggest positive outcomes, it is essential to recognise the need for further studies to validate and extend these findings. Considerably more work of quantitative nature will need to be done to determine students' actual game performance improvement and acquisition of tactical knowledge.

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## References

- Aguiar, M., Botelho, G., Lago, C., Maças, V., & Sampaio, J. (2012). A review on the effects of soccer small-sided games. *Journal of Human Kinetics*, 33(2012), 103–113. <https://doi.org/10.2478/v10078-012-0049-x>
- Almond, L. (2015). Rethinking teaching games for understanding. *Ágora Para La Ef y El Deporte*, 17, 15–25.
- AppBakkers, B. V. (2022). *Video-catch* (version 2) [iPad software application]. Retrieved from <http://itunes.apple.com>
- Armour, K. M., Casey, A., & Goodyear, V. A. (2016). A pedagogical cases approach to understanding digital technologies and learning in physical education. In: A. Casey, V. A. Goodyear, & K. M. Armour (Eds.), *Digital technologies and learning in physical education: Pedagogical cases*. (pp.1–12). Routledge.
- Atatekin, B., & Kara, M. (2024). The impact of augmented video feedback on middle school students' skill development in physical education. *Education and Information Technologies*, 29(1), 843–860. <https://doi.org/10.1007/s10639-023-12335-x>
- Barba-Martín, R. A., Bores-García, D., Hortigüela-Alcalá, D., & González-Calvo, G. (2020). The application of the teaching games for understanding in physical education. Systematic review of the last six years. *International Journal of Environmental Research and Public Health*, 17(9), 3330. <https://doi.org/10.3390/ijerph17093330>
- Berg, C., & Milmeister, M. (2008). From dialoguing with data to finding one's own way of telling the story. On grounded theory methodology coding procedures. *Forum: Qualitative Social Research*, 9(2).
- Bodsworth, H., & Goodyear, V. A. (2017). Barriers and facilitators to using digital technologies in the Cooperative Learning Model in physical education. *Physical Education and Sport Pedagogy*, 22(6), 563–579. <https://doi.org/10.1080/17408989.2017.1294672>
- Bunker, D., & Thorpe, R. (1982). A model for the teaching of games in secondary schools. *Bulletin of Physical Education*, 18(1), 5–8.
- Casey, A., Goodyear, V. A., & Armour, K. M. (2017). Rethinking the relationship between pedagogy, technology and learning in health and physical education. *Sport, Education and Society*, 22(2), 288–304. <https://doi.org/10.1080/13573322.2016.1226792>
- Chang, K. E., Zhang, J., Huang, Y. S., Liu, T. C., & Sung, Y. T. (2020). Applying augmented reality in physical education on motor skills learning. *Interactive Learning Environments*, 28(6), 685–697. <https://doi.org/10.1080/10494820.2019.1636073>
- Corbin, J. M., & Strauss, A. L. (2008). *Basics of qualitative research: Techniques and procedures for developing grounded theory*. SAGE.

- Darnis, F., & Lafont, L. (2015). Cooperative learning and dyadic interactions: Two modes of knowledge construction in socio-constructivist settings for team-sport teaching. *Physical Education and Sport Pedagogy*, 20(5), 459–473. <https://doi.org/10.1080/17408989.2013.803528>
- Diekhoff, H., & Greve, S. (2023). Digital technology in game-based approaches: Video tagging in football in PE. *Physical Education and Sport Pedagogy*, 1–13. <https://doi.org/10.1080/17408989.2023.2256758>
- Firmana, I., Subarjah, H., Mahendra, A., Nuryadi, N., & Sofyan, D. (2023). Improving football playing skills through teaching games for understanding: A small-sided games approach. *Journal Sport Area*, 8(2), 184–194. [https://doi.org/10.25299/sportarea.2023.vol8\(2\).12508](https://doi.org/10.25299/sportarea.2023.vol8(2).12508)
- Goodyear, V. A. (2020). Using digital technologies to support learning in physical education. In: S. Capel, J. Cliffe, & J. Lawrence (Eds.), *Learning to teach physical education in the secondary school: A companion to school experience*. (pp. 306–321). Routledge.
- Gréhaigne, J. F., Godbout, P., & Bouthier, D. (2001). The teaching and learning of decision making in team sports. *Quest*, 53(1), 59–76. <https://doi.org/10.1080/00336297.2001.10491730>
- Gréhaigne, J. F., Richard, J. F., & Griffin, L. L. (2005). *Teaching and learning team sports and games*. Routledge.
- Greve, S., Diekhoff, H., & Süßenbach, J. (2022). Learning soccer in elementary school: Using teaching games for understanding and digital media. *Frontiers in Education*, 7, 862798. <https://doi.org/10.3389/educ.2022.862798>
- Greve, S., König, S., & Diekhoff, H. (2023). Teaching games for understanding – Ein vernachlässigter Ansatz in der deutschsprachigen Sportpädagogik? [Teaching games for understanding – A disregarded approach in German-Speaking sports pedagogy?]. *Zeitschrift Für Sportpädagogische Forschung*, 11(1), 79–99. <https://doi.org/10.5771/2196-5218-2023-1-79>
- Greve, S., Thumel, M., Jastrow, F., Schwedler, A., Krieger, C., & Süßenbach, J. (2020). Digitale Medien im Sportunterricht der Grundschule: Ein Update für die Sportdidaktik?! [Digital media in primary school physical education: An update for sports didactics?!]. In: M. Thumel, R. Kammerl, & T. Irion (Eds.) *Digitale Bildung im Grundschulalter: Grundsatzfragen zum Primat des Pädagogischen [Digital Literacy at Primary School Age: Fundamental Questions on the Primacy of the Pedagogical]*. (pp.325–340). Kopaed.
- Harvey, S., Cope, E., & Jones, R. (2016). Developing questioning in game-centered approaches. *Journal of Physical Education, Recreation & Dance*, 87(3), 28–35. <https://doi.org/10.1080/07303084.2015.1131212>
- Harvey, S., & Jarrett, K. (2014). A review of the game-centred approaches to teaching and coaching literature since 2006. *Physical Education and Sport Pedagogy*, 19(3), 278–300. <https://doi.org/10.1080/17408989.2012.754005>
- Harvey, S., & Light, R. L. (2015). Questioning for learning in game-based approaches to teaching and coaching. *Asia-Pacific Journal of Health, Sport and Physical Education*, 6(2), 175–190. <https://doi.org/10.1080/18377122.2015.1051268>
- Hopper, T., Butler, J., & Storey, B. (2009). *TGFU – Simply good pedagogy: Understanding a complex challenge*. PHE Canada.
- Jastrow, F., Greve, S., Thumel, M., Diekhoff, H., & Süßenbach, J. (2022). Digital technology in physical education: A systematic review of research from 2009 to 2020. *German Journal of Exercise and Sport Research*, 52(4), 504–528. <https://doi.org/10.1007/s12662-022-00848-5>
- Kirk, D. (2013). Educational value and models-based practice in physical education. *Educational Philosophy and Theory*, 45(9), 973–986. <https://doi.org/10.1080/00131857.2013.785352>
- KMK. (2016). Bildung in der digitalen Welt – Strategie der KMK [Education in the digital world – KMK strategy]. <https://bit.ly/2A9RrvY>
- Koekoek, J., Dokman, I., & Walinga, W. (2023). *Game-based pedagogy in physical education and sports. Designing rich learning environments*. Routledge.
- Koekoek, J., & Van Hilvoorde, I. (2018). *Digital technology in physical education: Global perspectives*. Routledge.
- Koekoek, J., Van der Kamp, J., Walinga, W., & Van Hilvoorde, I. (2019). Exploring students' perceptions of video-guided debates in a game-based basketball setting. *Physical Education and Sport Pedagogy*, 24(5), 519–533. <https://doi.org/10.1080/17408989.2019.1635107>
- Koekoek, J., Van der Mars, H., Van der Kamp, J., Walinga, W., & Van Hilvoorde, I. (2018). Aligning digital video technology with game pedagogy in physical education. *Journal of Physical Education, Recreation and Dance*, 89(1), 12–22. <https://doi.org/10.1080/07303084.2017.1390504>
- Laughlin, M. K., Hodges, M., & Iraggi, T. (2019). Deploying video analysis to boost instruction and assessment in physical education. *Journal of Physical Education, Recreation & Dance*, 90(5), 23–29. <https://doi.org/10.1080/07303084.2019.1580637>
- Lebed, F. (2022). *Complexity in games teaching and coaching: A multi-disciplinary perspective*. (1st ed.). Routledge.
- Lee, A. M. (2003). How the Field Evolved. In: S. J. Silverman & C. D. Ennis (Eds.). *Student learning in physical education: Applying research to enhance instruction*. (pp. 9–25). Human Kinetics.
- Mackenbrock, J., & Kleinert, J. (2023). Motivational effects of digital media on students in physical education: a scoping review. *Journal of Physical Education and Sport*, 23(8), 2115–2116.
- Mckeever, J. T., & Runceanu, L. E. (2022). Replay the game and teach for understanding: Exploring the use of video tagging in an invasion games unit. *Physical Education and Sport Pedagogy*, 29(4), 361–375. <https://doi.org/10.1080/17408989.2022.2097653>



- Mey, G., & Mruck, K. (2009). Methodologie und Methodik der Grounded Theory. [Methodology and methods of grounded theory]. In: W. Kempf (Ed.), *Forschungsmethoden der Psychologie. Zwischen naturwissenschaftlichem Experiment und sozialwissenschaftlicher Hermeneutik [Research methods of psychology. Between natural science experimentation and social science hermeneutics]*. (pp. 100–152). Regener.
- Miller, W. (2015). Understanding grounded theory. *American Society for Clinical Laboratory Science*, 28(3), 197–200. <https://doi.org/10.29074/ascls.28.3.197>
- Neuber, N. (2019). Demokratie und Schulsport – eine vielversprechende Beziehung? [Democracy and physical education – A promising relationship?] *Sportpädagogik*, 43(2), 52–54.
- Nowels, R. G., & Hewit, J. K. (2018). Improved learning in physical education through immediate video feedback. *Strategies*, 31(6), 5–9. <https://doi.org/10.1080/08924562.2018.1515677>
- O'Loughlin, J., Chróinín, D. N., & O'Grady, D. (2013). Digital video: The impact on children's learning experiences in primary physical education. *European Physical Education Review*, 19(2), 165–182. <https://doi.org/10.1177/1356336X13486050>
- Potdevin, F., Vors, O., Huchez, A., Lamour, M., Davids, K., & Schnitzler, C. (2018). How can video feedback be used in physical education to support Novice learning in gymnastics? Effects on motor learning, self-assessment and motivation. *Physical Education and Sport Pedagogy*, 23(6), 559–574. <https://doi.org/10.1080/17408989.2018.1485138>
- Rekik, G., Khacharem, A., Belkhir, Y., Bali, N., & Jarraya, M. (2019). The instructional benefits of dynamic visualizations in the acquisition of basketball tactical actions. *Journal of Computer Assisted Learning*, 35(1), 74–81. <https://doi.org/10.1111/jcal.12312>
- Richard, J. F., & Wallian, N. (2005). Emphasizing student engagement in the construction of game performance. In: L. L. Griffin, & J. I. Butler (Eds.). *Teaching games for understanding. Theory, research and practice* (pp. 19–32). Human Kinetics.
- Rinaldo, R., Tarigan, B., & Juliantine, T. (2021). Review: The effect of the teaching game for understanding model on cognitive ability. *Kinestetik: Jurnal Ilmiah Pendidikan Jasmani*, 5(2), 375–380. <https://doi.org/10.33369/jk.v5i2.13828>
- Sandy, A., Wardiah, D., & Junaidi, I. A. (2023). The application of TGFU learning in basketball shooting learning. *Journal of Social Work and Science Education*, 4(3), 182–188. <https://doi.org/10.52690/jswe.v4i3.531>
- Sargent, J., & Calderón, A. (2021). Technology-enhanced learning physical education? A critical review of the literature. *Journal of Teaching in Physical Education*, 41(4), 689–709. <https://doi.org/10.1123/jtpe.2021-0136>
- Shank, G. (2006). *Qualitative research: A personal skills approach*. Pearson Education.
- Stolz, S., & Pill, S. (2014). Teaching games and sport for understanding: Exploring and reconsidering its relevance in physical education. *European Physical Education Review*, 20(1), 36–71. <https://doi.org/10.1177/1356336X13496001>
- Storey, B., & Butler, J. (2010). Ecological thinking and TGFU: Understanding games as complex adaptive systems. In: J. I. Butler, & L. L. Griffin (Eds.). *More teaching games for understanding: moving globally* (pp.139–154). Human Kinetics.
- Strauss, A., & Corbin, M. (2010). *Grounded Theory. Grundlagen qualitativer Sozialforschung [Grounded theory: Foundations of qualitative social research]*. Beltz.
- Thorpe, R. (1990). New directions in games teaching. In: N. Armstrong (Ed.). *New directions in physical education* (pp. 79–100). Human Kinetics.
- Thorpe, R., Bunker, D., & Almond, L. (1984). A change in focus for the teaching of games. In: M. Pieron, & G. Graham (Eds.). *Sport pedagogy: Olympic scientific congress proceedings* (pp. 163–169). Human Kinetics.
- Tulodziecki, G. (2015). Dimensionen von Medienbildung: Ein konzeptioneller Rahmen für medienpädagogisches Handeln [Dimensions of media education: A conceptual framework for media educative practice. *MedienPädagogik: Zeitschrift Für Theorie Und Praxis Der Medienbildung*, 31–49. <https://doi.org/10.21240/mpaed/00/2015.06.05.X>
- Vollstedt, M., & Rezat, S. (2019). An introduction to grounded theory with a special focus on axial coding and the coding paradigm. In: G. Kaiser & N. Presmeg (Eds.). *Compendium for early career researchers in mathematics education* (pp. 81–100). ICME-13 Monographs Springer.
- Widowati, A., Decheline, G., & Dinafi, Y. (2022). Implementation of teaching game for understanding approach for improvement man to man marking (defense) to Beginner basketball player. *Kinestetik: Jurnal Ilmiah Pendidikan Jasmani*, 6(1), 178–182. <https://doi.org/10.33369/jk.v6i1.21127>