“PE is basically about being active”: Students’ perspectives on media education in physical education

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ABSTRACT

Digital media are playing an increasingly important role in the sport culture of children and adolescents. In line with educational policy guidelines, physical education (PE) teachers are expected to address media-educational tasks as part of their teaching. To gain deeper insight into how this is implemented in everyday school practice, this study explores students’ perspectives on the integration of such tasks in PE. Based on qualitative interviews with upper secondary school students in Germany, the findings show that in PE digital media are primarily used to support students’ initial understanding of movements, to enable the analysis of their own performance, and to organise lessons. The critical-reflective dimension of learning about media, however, is rarely addressed. Consistent with previous studies involving teachers, the results also reveal a certain scepticism among students regarding the use of digital technologies in PE. This scepticism appears to stem from the perception that the use of technology and related reflection processes conflict with PE’s primary focus on physical activity. As a result, students tend to view digital media as a potential threat to movement time. Additionally, they express concerns about data privacy and bodily exposure. These findings provide valuable reference points for the further development of media-educational tasks in physical education.

Keywords

physical education, digital media, digitalisation, media education, media literacy, students

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Introduction

International (e.g., Smahel et al., 2020) and national studies (e.g., Medienpädagogischer Forschungsverbund Südwest, 2024) on media usage indicate that the everyday lives of children and adolescents are deeply permeated with digital media.[1] As Moser (2021, p. 712) emphasises, media are no longer confined to an "external sphere of everyday life",[2] but are instead deeply embedded in the daily experiences of young people. As living environments change, so do the demands expected from students in a digitised world (Krotz, 2018). In this context, Herzig (2023) highlights schools as important sites for pedagogical engagement with media. In the German-speaking discourse, the goals and the content associated with this are often framed through the dual perspectives of teaching and learning *with* media and *about* media (e.g., Bastian, 2017; Rummler et al., 2021). While the former perspective emphasises how digital media can be used to support and enhance learning processes, the latter aims to initiate and foster students' media-related competences, with the goal of enabling them to act in an informed, autonomous, creative, and socially responsible manner in a media-saturated world (Tulodziecki et al., 2021, p. 199). This also indicates that teaching and learning about media must not be limited to the promotion of handling technology in the sense of competences required for the functional use and application of media. Rather, it should also support the development of skills for analysing and evaluating media content and one's own media contributions, creative abilities for producing media content, and the capacity for exercising judgement within media contexts (Tulodziecki & Grafe, 2019).[3]

Various governmental educational policy documents and frameworks highlight the importance of addressing media-educational tasks in school. For instance, the European Union's *Digital Education Action Plan* includes measures such as the promotion of digital competences through the *DigComp* framework (Vuorikari et al., 2022) and the improvement of digital infrastructure (European Commission, 2018). In Germany, the Conference of the Ministers of Education and Cultural Affairs (Kultusministerkonferenz, 2017) defined two key goals with regard to digitalisation in schools: (1) The meaningful integration of digital media into teaching and learning, and (2) The promotion of media competences as an integral part of all subject curricula. Although these educational policy objectives take up basic media-educational considerations, from a scientific perspective, it has been pointed out that existing policy frameworks often adopt a functional understanding of media, thereby neglecting more critical-reflective dimensions (e.g., Bastian, 2017). This tendency is also evident in physical education curricula in German-speaking countries (Meier & Poweleit, 2023).

1. Tulodziecki and Grafe (2019, p. 717) point out that the term *media* is used in various ways. In educational contexts, they therefore suggest "restricting the term to forms and experiences by which contents are mediated with technical support".

2. The cited English version is the authors' own translation from the original German text.

3. A range of national and international frameworks address the concept of media competence, which is commonly discussed in international contexts under the term *media literacy*. Tulodziecki and Grafe (2019) provide an overview of these approaches.

The German Society for Subject-specific Didactics (Gesellschaft für Fachdidaktik, 2018) emphasises the importance of integrating both subject-specific and media-educational objectives. For PE, the overarching pedagogical orientation is the concept of *Bildung-oriented physical education* (Ruin & Stibbe, 2021; Wibowo et al., 2022), which is embedded in various curricula of Germany, Austria, Switzerland and Luxembourg (Meier & Poweleit, 2023). At the core of this concept are two main objectives: the so-called *Doppelauftrag*, which encompasses both education *toward* sport and education *through* sport (summarised in Meier & Poweleit, 2023; Wibowo et al., 2022): As part of education toward sport, for example, the aim is to develop sport- and movement-related competences in order to gain access to and understand the diverse culture of movement and sport. According to Prohl (2012), education toward sport is therefore aimed at a so-called *Bewegungsbildung* (movement-related objectives in PE). Next to that, education through sport aimed to foster students' comprehensive personal development, for example by acquiring personal and social competences. Based on Prohl (2012), education through sport thus aims to provide a so-called *Allgemeine Bildung* (overarching objectives of education).

The question of how to interweave the perspectives of teaching and learning with and about media in physical education has already been addressed in various contributions (e.g., Goodyear et al., 2019; Greve et al., 2020; Meier & Ruin, 2021; Poweleit, 2021b; Thumel et al., 2020; Vogt et al., 2019). Fundamentally, the objectives of sport and media education (education toward and through sport as well as learning with and about media) are intertwined and constitute a unitary and integrative task. In practical implementation, certain areas can certainly be accentuated more strongly. As already mentioned, however, a constant one-dimensional approach can lead to an imbalance (Greve et al., 2020; Poweleit, 2021b).

In summary, and based on the concept of *Bildung*, the objective of physical education is a critical and reflective engagement with the subject matter in order to promote the development of maturity and therefore the ability to self-determination and self-development (Ruin & Stibbe, 2021; Wibowo et al., 2022). In this context, it also includes enabling children and young people to participate responsibly in a sport culture that is increasingly shaped by digitalisation (Rode, 2021).

This also highlights that digital media must not be treated as "innocent tools" (Rode, 2021, p. 15) in physical education. Media should therefore not solely be seen as instruments for improving motor performance but should also be embedded in reflective learning processes. In physical education, this could mean, for example, that students engage with fitness exercises presented by influencers, while simultaneously reflecting on these media representations. Learning about media in this context also involves a critical examination of such content, for instance, in terms of its relevance for one's own physical activity, the body ideals it conveys, or the underlying commercial interests (Bell et al., 2022; Camacho-Miñano et al., 2021). Media and media-related experiences in PE should therefore always be understood as opportunities for reflection aimed to support students' self-determined participation in a sport culture that is co-shaped by media.

The scientific framework for the implementation of media-educational tasks is therefore clearly outlined. However, the further development of media education requires empirical insights into how media-educational content is currently included in physical education, as well as into the perspectives of the various actors involved in school sport. In order to gain deeper insights into the media-educational realities of everyday teaching and learning in physical education, it is essential to consider not only teachers' perspectives (Korte & Grimminger-Seidensticker, 2025; Rehlinghaus, 2023, 2024; Rehlinghaus et al., 2024; Roth, 2022), but also those of students, who may be regarded as "co-creators of physical education" (Miethling & Krieger, 2004, p. 7). Bräutigam (2011, p. 65) similarly emphasises that students are "capable of making a differentiated assessment of themselves and their experiences in physical education as recognising and reflective individuals". These conceptualisations highlight that learners are not merely recipients of pedagogical intentions but active interpreters of teaching practices.

Against this backdrop, recent reviews (e.g., Jastrow et al., 2022) point out that only limited empirical research has examined how media education is perceived, negotiated, and experienced from students' perspectives in physical education (e.g., Greve et al., 2022). Yet, their perspectives represent a crucial analytical lens for capturing both the pedagogical potentials and the perceived constraints of media education in PE. Moreover, insights into how students make sense of media-related learning processes provide an important basis for informing the future professional development of teachers, particularly with regard to the media-educational dimensions of physical education.

State of Research

The literature review by Jastrow et al. (2022) provides an overview of the international research on the use of digital media in physical education. Overall, the review demonstrates that previous studies have primarily focused on the effects of digital media, particularly with regard to physical activity, motivation (see also Mackenbrock & Kleinert, 2023) or cognitive performance. In contrast, there is still limited research that examines the everyday realities of teaching in relation to the implementation of the media-educational tasks outlined above (teaching and learning with and about media).

With regard to the research interest of this article, the following section summarises empirical findings that provide insight into students' perspectives. Currently, only intervention studies in which the use of digital media were scientifically monitored and subsequently evaluated based on the experiences of the participants offer relevant information on this topic.

Concerning opportunities of digital media in PE, several studies (e.g., Bodsworth & Goodyear, 2017; Casey & Jones, 2011; Diekhoff & Greve, 2023; Wallace et al., 2022) show that students report that the use of digital media may support their understanding and learning of movement. For instance, secondary school students in Australia stated that the use of video-based movement analyses helped them to engage in more in-depth discussions about previously conducted movements they had performed in class and to provide more insightful feedback to their peers (Casey & Jones, 2011). Similar findings emerge from a study by Vega-Ramírez et al. (2020) with Spanish adolescents aged 15 to 18. After completing PE lessons supported by a fitness app, the interviewees expressed that the app helped them to better understand the theoretical background of physical activity. Empirical findings from an intervention project using an app (Mr. Griddle)[4] for movement inspiration in dance lessons further indicate that, from the students' perspective, digital media can inspire creative and artistic processes (Steinberg et al., 2020). In addition, interviews with primary school students in Germany following a one-year media-supported intervention show that the use of digital media can open up new possibilities for participation in PE (Diekhoff & Greve, 2023; Greve et al., 2022). For example, some students reported that by acting as camera operators during the filming of movements, they were able to contribute in ways not directly tied to motor performance.

Alongside these opportunities related to media-educational aspects in physical education, existing empirical findings from intervention studies also indicate that adolescents perceive digital media as resources with limited applicability. In several studies participants emphasise that video feedback could by no means replace the feedback provided by a teacher (Bodsworth & Goodyear, 2017; Wallace et al., 2022). Furthermore, new organisational challenges were pointed out (Bodsworth & Goodyear, 2017; Diekhoff & Greve, 2023). For example, studies by Bodsworth and Goodyear (2017) and Marttinen et al. (2019) revealed that students encountered technical difficulties when using digital devices or perceived wearing fitness trackers during swimming lessons as impractical. Further findings indicate that digital media may also negatively affect the interviewees' well-being. In this context, young people who were interviewed after the

4. Mr. Griddle is a stick figure character used in an app to inspire creative movement in dance (Steinberg et al., 2020).

exploratory use of the tracking app *Fitbit*, reported that, while tracking initially motivated them to increase their physical activity, the ongoing group comparisons within the class eventually led to performance pressure (Kerner & Goodyear, 2017). In a study by Steinberg et al. (2020), students expressed concerns about data privacy in relation to digital media use. They experienced increased bodily exposure when they were filmed and felt uncomfortable about videos of themselves being uploaded to digital databases. Another commonly mentioned limitation of using digital media in physical education, from the students' point of view, concerns the reduction of time spent being physically active (e.g., Bodsworth & Goodyear, 2017; Engen et al., 2018; Marttinen et al., 2019; Wallace et al., 2022). In this regard, students note that the use of digital media during interventions often results in reduced physical activity, thus counteracting the importance of ensuring sufficient physical activity during PE (e.g., Wallace et al., 2022).

So far, empirical insights about students' perspectives on media-educational aspects in physical education have almost exclusively been derived from intervention studies, often with a particular focus on teaching and learning with media. In such studies, digital media use is implemented in a controlled setting and accompanied by scientific monitoring. However, there is a lack of research that examines how students experience and evaluate media education in the context of everyday physical education. In light of these considerations, it seems essential to systematically consider students' perspectives with regard to teaching and learning with and about digital media. On the one hand, it is relevant to examine what students report about everyday teaching practice. On the other hand, it is of interest to explore the specific opportunities and challenges that students perceive in relation to the implementation of these tasks. These perspectives, in turn, can offer valuable insights for the further transfer and design of future media-educational activities in physical education. In this context, the following two research questions guide this study:

1. How is teaching and learning with and about digital media orchestrated in physical education from the students' perspective?
2. What opportunities and challenges do students perceive with regard to teaching and learning with and about digital media in physical education?

Methodology

To address the research questions, a qualitative approach using semi-structured interviews was chosen. Such interviews are particularly well-suited when researchers aim to "learn about people's beliefs, perspectives, opinions, lived experiences, and meaning making" (Roulston & Halpin, 2022, p. 30). In this context, semi-structured interviews are an appropriate method for exploring students' perspectives on media-educational tasks in physical education. At the same time, this also implies a limitation: As Roulston and Halpin (2022, p. 31) emphasise, researchers using interviews are "less concerned with the truth value of what people say than [with] participants' meaning making and interpretations of their life experiences".

Between October and December 2023, a total of 20 upper secondary school students (11 male, nine female) from both grammar schools [in German: *Gymnasium*] and comprehensive schools [in German: *Gesamtschulen*] were interviewed at their respective schools. The study was approved by the university ethics committee [Ethics Application No. 169/23]. The participants' ages ranged from 17 to 20 years (M = 17.5). All interviewees were enrolled in basic physical education classes (in German: *Grundkurse*), which typically consist of three 45-minute lessons per week. Most participants were recruited through their PE teachers, who had participated in earlier studies (Rehlinghaus, 2024). To recruit additional students, further PE teachers were contacted via school mailing lists and asked to support the recruitment process. As Bräutigam (2011) notes, empirical research in physical education has shown differences in the perspectives of male and female students. Accordingly, one

male and one female student were interviewed at each school in order to take this into account and to ensure a broad range of experiences. Only at one school two boys were interviewed due to illness of the female student. Since participation was voluntary and no student could be required to take part, the study depended on students coming forward on their own initiative. As a result, it was not possible to deliberately consider students' sport biographies (e.g., participation in club sports) during sampling. Nevertheless, the interviewed students reported a wide range of sporting backgrounds, which suggests that, for example, not only performance-oriented students were included in the study. With regard to the infrastructural conditions at the schools, it can be stated that most schools were equipped with smartboards and tablets. In addition, learning platforms had been established at the majority of schools. In contrast, sports halls often lacked Wi-Fi access, and school tablets were not readily available for use, meaning that students frequently had to rely on their own personal devices.

All interviews were audio-recorded and subsequently transcribed with the help of Amberscript software. Afterwards, they were manually edited and corrected in accordance with Dresing and Pehl's (2018) guidelines. The transcripts were then translated into English by the authors.

To enable a systematic analysis of the extensive data material supported by theoretical assumptions, the data were analysed using a deductive-inductive approach based on the qualitative content analysis according to Kuckartz and Rädiker (2019). Deductive categories concerning the orchestration of teaching and learning with and about digital media, as well as the opportunities and challenges of teaching and learning with and about digital media were developed to provide an initial structuring. Subsequently, inductive categories were created based on the aspects that emerged from the data. The development of inductive categories was carried out in two stages. First, a coding round was conducted to conceptualise the inductive categories based on a subset of the data. This was followed by fine coding carried out independently by both authors. Final decisions on remaining discrepancies in the category assignments were made in accordance with consensual coding (e.g., Guest et al., 2012), involving an additional research assistant from the research group. The category system can be found in Table 1.

Table 1
Category System

Main Categories	Subcategories	Exemplary Anchor Quotes
Teaching and learning with digital media	Use of digital media to support initial movement understanding	When we were covering the topic of badminton, the teacher uploaded a link for us that we were supposed to watch. In the video, they basically explained how to perform the stroke in the best way, so we were able to learn it from that. (I07, pos. 58)
	Use of digital tools for analysing one's own movement	So, my friend filmed me doing the clear, and I filmed him, and then at the end we basically compared our video with what was shown in the video that the teacher had uploaded for us. (I07, pos. 62)
	Use of digital media to support organisation in PE lessons	That we use OneNote […] For us, the teacher has a table, a kind of overview chart showing what we do in each lesson, and then I can always check what we are doing this period. (I08, pos. 72)
Teaching and learning about digital media	Addressing the functionality and content of digital media	We discussed various fitness influencers, but only in terms of how they structure their workouts and how they select the exercises. (I02, pos. 54)

Main Categories	Subcategories	Exemplary Anchor Quotes
Opportunities of learning and teaching with and about digital media	Support and enhancement of movement learning	I had thought the whole time that I was stretching my leg, and because the filming worked on the second try, I then saw that I wasn't stretching it at all — it was bent. And then you could really see that there was still room for improvement. (I09, pos. 86)
	Motivation to engage in sports outside of school	Yeah, I'd say that it does help you move forward in some way. I mean, the digital media also motivated me to keep going, I'd say, or to go to the gym. (I09, pos. 44)
Challenges of learning and teaching with and about digital media	Tension between movement orientation and media integration	Yes, because physical education is carried out in practice and not in theory. I mean, I don't want to have my PE lessons on an iPad, that wouldn't make any sense, because for me sport is movement, and I don't need an iPad or a phone for that. (I04, pos. 73)
	Organisational barriers	That was pretty annoying, because some iPad was always running out of battery. Then someone had to go over again, unlock it, and then the video wouldn't load or you could barely see anything on it. (I02, pos. 66)
	Concerns related to the use of video material	Well, let's say, if you have to film yourself, sure, there are some girls, some boys … who don't dare to record themselves, because, as I said, not everyone feels comfortable in their body. (I17, pos. 81)

Results

3.1 The Orchestration of Teaching and Learning With and About Digital Media

Overall, the findings indicate that, from the students' perspective, learning with media is addressed more frequently than learning about media. Regarding the orchestration of teaching and learning with media,[5] almost all students report prior experiences using digital media to support initial movement understanding. The interviewees state that, for example, videos from YouTube or specialised physical education apps are used by teachers to introduce certain movement characteristics of techniques (I03, pos. 51), tactics in sports games (I01, pos. 51), or to provide inspiration for dance choreographies (I15, pos. 56). Students state that videos from fitness apps, fitness influencers, or world-class athletes serve as starting points for imitation (I02, pos. 51): "and last year he showed us videos … of some gymnast at the Olympics or something, and then we were supposed to say, what he is doing, what is the gymnast doing there?"[6] (I05, pos. 96). In addition to existing media from the internet, some students also mention that they themselves were asked to research technical characteristics online or that they were asked to create tactical videos (e.g., for flag football or hockey) for the class in group work.

Most students also report that digital media are used to analyse their own movements. Movement performances in activities such as hurdling (I01, pos. 52) or

5. "To what extent have digital media been used in your physical education classes so far?"

6. All direct quotations from German-language sources were translated by the authors into English, with original page numbers provided.

gymnastics (I06, pos. 65), as well as activities in the area of gymnastics/dance (I10, pos. 72), and game situations in sports like table tennis (I12, pos. 80) or badminton (I07, pos. 58), are first recorded using their own smartphones or tablets. Afterwards, the recordings are analysed by the students, often with the help of specialised motion analysis apps, based on specific technical criteria that had been introduced beforehand (I11, pos. 80).

Students repeatedly mention that digital media are used to support the organisation of physical education lessons by both teachers and students. For example, one student reports that task cards and setup plans are to be accessed by students via a tablet (I10, pos. 74). Digital media are also used outside of class in this context. Several students describe that learning management systems, e.g., Moodle, are used by teachers to communicate information about the content of individual lessons (e.g., I08, pos. 71), scheduling of group presentations (I03, pos. 79), or even grades (I07, pos. 78).

The analysis of the conducted interviews shows that according to the students, learning about[7] media becomes a subject of instruction in only very few cases. The respective accounts are mostly vague and rarely allow for a differentiated analysis. For instance, two students indicate that fitness apps were merely examined with regard to their functionalities, or that only the structure of fitness videos by influencers was discussed: "We have dealt with it, but rather superficially, like, how do different fitness influencers design things? Where can you do better?" (I02, pos. 52). Furthermore, some students report that learning about media included incidental mentions of the functionalities of apps, such as cutting songs or videos in the context of dance choreographies (I01, pos. 81).

3.2 Opportunities and Challenges of Teaching and Learning With and About Digital Media

The students' responses regarding the challenges[8] of media-educational tasks in physical education reveal that almost all of them perceive PE as a subject centred on physical activity and its compensatory function, clearly distinguishing it, from the students' view, from cognitively oriented academic subjects. One student explains: "I don't really learn much here in PE that I use in my everyday life, but it's just about releasing energy, getting out of the school world, and doing something different from staring at root equations all the time" (I19, pos. 78). Such perspectives on physical education follow an understanding that leaves little room for theoretical and reflective engagement with subject content. Accordingly, media-education aspects are perceived as contradictory to the subject itself: "If you use digital media, the iPad again, it's kind of like 'real' lessons. Even if PE is still a lesson, it's more like play, fun, and showing what you can do" (I10, pos. 82). Consequently, many students regard teaching and learning with and about media as conflicting with PE as a subject of movement: "I don't want to have my PE lessons on the iPad, that wouldn't make sense, because for me, sport means movement, and I don't need an iPad or a phone for that" (I04, pos. 73). Based on this shared understanding of the purpose of PE, students generally view digital media as a merely optional tool:

7. Questions: "Have you ever talked about media content in your PE lessons? If so, what kind of content was discussed?" or "Were there any topics you recognised from social media, for example, body images, fitness trends, or online challenges?"

8. Questions: "Have you ever experienced any difficulties when digital media were used in PE class? Can you describe them?" or "What challenges do you face when digital tools (like tablets, videos or apps) are used in PE?"

> And yes [the iPad], it can help with improving technique and can give you tips, but I think that's also what the PE teacher is there for, to implement and instruct on which techniques to use. That's why I would see it more as a helpful tool that can be quite practical, but not absolutely necessary in PE. (I12, pos. 100)

In addition to these perspectives on the limits of pedagogical approaches to digital media in physical education, students also describe concrete problems when using digital media in practice. They report technical issues with devices, e.g.: "Then an iPad shut down again, someone had to go unlock it; then the video didn't load; then you couldn't see things clearly in the video" (I02, pos. 66). The interviews also reveal infrastructural challenges. For example, students mention problems with the lack of Wi-Fi (e.g., I18, pos. 88) or an insufficient number of digital devices (e.g., I14, pos. 94). Moreover, students express concern about the risk of damage of digital equipment during lessons:

> It's always the case that you have to use the iPad where, for example, you're also dealing with balls. There's a risk that the iPad gets broken, like last year, when we had to put the iPads right on the edge and be careful. That's kind of a hindrance too, because you're worried about the iPad … (I10, pos. 86)

Some students also raise concerns with regard to data privacy when using video material in PE. One student expresses discomfort with the idea that movement analysis videos might end up in the wrong hands and get misused: "Data protection is, of course, an issue, there's a risk that those videos accidentally get to other students who might publish them or something, and maybe you don't want that. That's definitely a big risk with video recordings" (I06, pos. 66). Furthermore, several students voice concerns about filming their own bodies: "Well, let's say, if you have to film yourself—sure, there are some girls, some boys … who don't dare to record themselves, because, as I said, not everyone feels comfortable in their body" (I17, pos. 81). One female student also points out differences between types of physical activities, suggesting that body-centred sports may be perceived as particularly sensitive. She explains:

> I think there are situations where you might say, for example, 'I don't want to be filmed doing a certain yoga pose,' because it could be interpreted very differently. In such cases, I would say, 'No, I don't want that'. Even if I had signed something beforehand, I'd still say: 'No, I don't want this! Sorry!' (I01, pos. 65)

The opportunities students see in media-education tasks[9] are primarily related to the process of learning movement. Digital media are frequently described as useful in gaining a deeper understanding of movement concepts. For instance, students say digital media help to better understand tactics in team sports (I03, pos. 66) or to visualise movement techniques (I19, pos. 62). In this context, students see advantages in watching movement demonstrations by professional athletes instead of by the teacher:

> It's still just one teacher teaching it and not someone who does it professionally. There's a huge difference in who shows it to you. If there's a professional athlete showing how it works in a video, it's obviously much more convincing than when a teacher is standing there jumping around. (I19, pos. 62)

Another student describes how being filmed can increase their motivation: "Maybe because a camera is pointed at you, you feel that extra motivation to give a little more, so it looks as good as possible" (I06, Pos. 70). Overall, students often mention that digitally supported lessons also encourage cooperative learning scenarios: "Because it's not the teacher explaining with all the technical terms, but someone your own age saying: 'this is what it means', in case you didn't

9. Questions: "What do you like about using digital media in PE?" or "Have you ever found the use od digital media in PE helpful? If so, how?"

understand it" (I01, pos. 61). From one student's perspective, digital media also offer a specific advantage during movement learning. Namely that they reduce the need for physical correction by the teacher. She explains:

> I actually think that's good, because then physical contact between teacher and student is no longer necessary. For example, if you are supposed to take a certain posture, then there might be touching or something … If you learn and check it by video instead, then yeah, I am standing roughly the same. Sure, you might still be missing the correct posture, but I find that the touching thing is a bit critical, when someone tells you 'this is how you have to stand'. (I01, pos. 71)

Furthermore, some students also report that using digital media in PE motivates them to be physically active outside of class. Fitness apps introduced in class provide concrete exercises for independent workouts and support students in organising their training autonomously. They also find it motivating to track their own progress, since they can directly observe their performance development: "Because you can directly track the data and see how you're improving" (I06, pos. 76).

Discussion

In relation to the implementation of media-educational tasks, the students' accounts suggest that physical education primarily emphasises teaching and learning with digital media, particularly to support movement concepts or to analyse game situations. Accordingly, the narratives indicate that digital media are used almost exclusively as tools to enhance motor performance, often through the use of digital demonstrations by elite athletes. As outlined in the state of research, several studies point to potential benefits of using video analyses within motor learning processes (Jastrow et al., 2022). These potentials are also reflected in the students' perspectives in our study. Video analyses may thus be considered, from multiple empirical perspectives, a potentially valuable resource for physical education in the context of motor learning. At the same time, this one-sided use of digital media reflects a rather narrow and seldom critically examined understanding of performance in physical education. This limited conception of performance is also evident in how students describe the opportunities associated with digital media: the perceived potentials relate almost entirely to performance optimisation. Overall, it should therefore be taken into account that, from the perspective of *Bildung-oriented* physical education (cf. Introduction), motor learning should not be solely understood in terms of the achievement of standardised benchmarks. Instead, as Meier and Stibbe (2023) argue, a broader concept of performance is needed, one that places students at the centre as subjects, responds to their individual conditions, and allows for personal development. This also includes addressing and critically reflecting on idealised notions of performance as conveyed, for example, through fitness apps or social media influencers.

Moreover, the conversations with students offer only very few indications that their teachers focus on the perspective of learning about media, a finding that closely mirrors teachers' own reports of prioritising a functional perspective over the critical-reflective engagement with media (Korte & Grimminger-Seidensticker, 2025; Rehlinghaus, 2024).

In view of the interview findings, physical education appears to contribute only to a limited extent to the development of media-pedagogical competences -measured against the aforementioned educational goals of teaching and learning about media (Tulodziecki et al., 2021), and primarily with regard to the mainly functional use of digital technologies (see also Jastrow et al., 2022). In this way, only a reductionist understanding of the concept of *Bildung-oriented* PE is ultimately characterised (Meier & Poweleit, 2023). There is a notable absence of references to a critical-reflective engagement with media in the students' accounts. This is particularly important given that students encounter not only inspiring but also confusing or problematic content in everyday sporting contexts, such as on social media (Kaptan et al., 2022). A

physical education curriculum that is oriented toward students' lifeworlds and their sport culture, and that also incorporates media-pedagogical demands, should therefore address these diverse and ambivalent experiences.

Moreover, the interview statements concerning the challenges of media-educational tasks in physical education reflect familiar conceptions of the subject held by the students (Gerlach et al., 2006; Lyngstad et al., 2019; Modell & Gerdin, 2022; Murfay et al., 2022; Süßenbach & Schmidt, 2006). Physical education is thus understood by the students as a practice-oriented subject that serves as a counterbalance to the more cognitively demanding so-called academic subjects and is primarily expected to provide enjoyment and (as much as possible) opportunities for movement. These conceptions imply a rather conservative or traditional understanding of PE one that is less aligned with current, curriculum-anchored pedagogical concepts (such as *Bildung-oriented* PE) and more closely tied to a performance- and training-oriented sport culture (e.g., Ernst, 2018a; Poweleit, 2019).

Against this backdrop, students often locate the relevance and potential of media education in other subject areas, where they already perceive the use of digital media as self-evident. Consequently, they describe reservations toward media education primarily as subject-specific to physical education. These perspectives closely correspond with the views held by PE teachers regarding physical education in general (Ernst, 2018a, 2018b; Poweleit, 2019, 2021a; Serwe-Pandrick et al., 2023) and media education in particular (Rehlinghaus, 2024).

For the further development of media education in PE, two central challenges become apparent. On the one hand, the scepticism of teachers towards media-educational tasks must be dealt with (Rehlinghaus, 2024; Roth, 2022). On the other hand, our study demonstrates that students also voice reservations, which may further complicate the implementation of comprehensive media education in physical education. Ultimately, such reservations are rooted in a persistent traditional understanding of the subject (see above), which appears to guide the thinking and actions of many students and teachers. This understanding may impede school innovations and development processes, such as digitalisation or inclusion (Meier & Poweleit, 2022). Against this background, media education is perceived as being associated with cognitive effort and therefore as a potential threat to time spent being physically active (Wallace et al., 2022). The students' accounts indicate that they perceive digital media as meaningful only when it contributes to the improvement or deeper understanding of sport-related motor processes in physical education.

Further statements by students concerning the challenges of media education in PE corroborate existing empirical findings regarding students' experiences in research-based interventions. Students frequently experience infrastructural barriers, such as limited access to Wi-Fi or a lack of devices, as obstacles to pedagogically meaningful media integration (similar to Bodsworth & Goodyear, 2017). This underscores the necessity of enhanced infrastructural conditions to enable a more effective use of the potential offered by digital media in physical education. This is all the more important in light of recurring concerns that media use may reduce time for physical activity, particularly when it is experienced as being associated with considerable organisational effort. At the same time, students' concerns regarding data protection when using video material (similar to Steinberg et al., 2020) should be taken seriously. According to the interviewees, the use of video material in particular may reinforce existing feelings of shame in physical education (Wiesche & Klinge, 2017) and potentially intensify situations that students already perceive as uncomfortable. This underscores the importance of a sensitive and reflective pedagogical approach. Teachers should take these experiences into account when implementing video-based teaching practices, actively engage with students' perspectives, and reflect on them collaboratively. Furthermore, guiding students towards a responsible and considerate use of video material remains essential (Roth et al., 2025).

Based on the opportunities mentioned by the students, it can be concluded that they perceive digital media as a supportive and motivational tool that also helps

them stay physically active outside of class. These statements suggest that physical education, in such contexts, connects to students' everyday lives in meaningful ways. In the sense of learning about media, those lifeworld-related (individual and collective) experiences, perspectives and problems (e.g., in the course of digital self-measurement) can also be used as an opportunity to deal in depth with the ambivalent and multidimensional messages associated with them (e.g., Bastian, 2017; Poweleit, 2021b).

Concerning the study's limitations, it has to be noted that the study does not provide direct insights into physical education classes but reconstructs school reality solely through students' perspectives. Additionally, the sample selection entails certain limitations, as it is restricted to upper secondary students from grammar and comprehensive schools in North Rhine-Westphalia. At the same time, the study broadens the perspective on media education in PE by incorporating interviews with students, offering insight into their everyday classroom experiences. The findings thus provide important reference points for the further development of media-pedagogical aspects within the subject of physical education

Conclusion

This study provides qualitative insights into how media-educational tasks are orchestrated in physical education from the students' perspective and how they perceive the associated opportunities and challenges. The findings indicate that digital media are primarily used to support and improve motor performance, while opportunities for reflective engagement with media in the sense of learning about media are rarely addressed in everyday classroom practice. In line with previous research on PE teachers in German-speaking countries (Rehlinghaus, 2024), students also express reservations regarding a more extensive implementation of media-educational content in physical education, which are often rooted in their fundamental conceptions of the subject and its primary goals.

Future research should therefore examine how subject-specific orientations can be constructively developed so that they do not act as barriers to innovation in relation to media-educational objectives. Approaches for integrating media education in physical education should explicitly consider students' ideas and concerns, for example, with regard to potential reductions in physical activity time, into account. In addition, research should pay closer attention to young people's media practices in sport-related contexts (e.g., Muhsal et al., 2023; Rode & Zander, 2023), since these lifeworld experiences provide valuable pedagogical points of connection for lesson designs. Strengthening such links may enhance the perceived relevance of media-related content and increase students' willingness to engage in critical reflection on media use in physical education.

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Data availability statement

All relevant data are within the paper.