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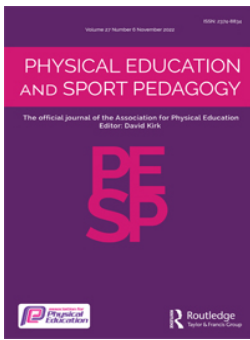
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Replay the game and teach for understanding: exploring the use of video tagging in an invasion games unit

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ABSTRACT

Background: Combining Game-Based Approaches, video feedback, and debate of ideas (*débat d'idées*) constitutes an emerging field within pedagogical literature in Physical and Health Education. Nevertheless, more work is needed to understand how this digital tool can be effectively integrated into the teaching and learning process.

Purpose: This study sought to further investigate the effective implementation of video tagging in games lessons with 14–15-year-old students. The central aim was to explore how a Game Sense Approach can be effectively integrated with video tagging and student-led debates. The secondary aim was to investigate the emergence of so-called 'action rules' (game plans) which emerge from these verbal exchanges.

Participants and Setting: Game Sense pedagogy and video tagging were used as a stimulus for student-led debates during seven lessons. A pragmatic epistemological approach underpinned iterative cycles of action research using recordings from student-led debates critical collegial discussions, and teacher reflections to inform the implementation of the approach. A *post-hoc* thematic analysis of the PHE teachers' reflections and content analysis of student debates were then conducted.

Findings: The results of the action research process revealed that *organisation* and *what to tag* were key considerations in the successful implementation of the approach. The results from student interactions showed a high level of team-based positive action rules, with a low level of negative feedback.

Conclusion: This study highlights the importance of critically considering technology integration, the content of student interactions, and their pedagogical implications. The integration of video tagging in diverse game-based situations can provide pedagogical and organisational challenges. However, key considerations of *organisation* and *what to tag* may help PHE teacher identify appropriate learning situations to use video tagging as a stimulus for the debate of ideas.

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Introduction

Digital technology is increasingly prevalent in the delivery of Physical and Health Education (PHE) worldwide (Goodyear 2020). Despite the increased popularity of digital innovations and the use of the latest gadgets and mobile applications in schools, there is a cautionary consensus amongst PHE scholars that it should not be used for the sake of it, neither should it drive pedagogical

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decisions – but support the development of high-quality teaching and learning (Casey, Goodyear, and Armour 2017). In a Swedish context, it has recently become a requirement to use digital tools to plan, carry out, and review movement activities in PHE (Swedish Department of Education 2019). Therefore, as technology integration is increasingly mandated by national curricula (see for example Australia), it is no longer the choice of early innovators, but an issue which wider numbers of PHE teachers must contend with.

The use of iPad apps to provide students with video feedback is a popular and increasingly viable use of technology to support learning in PHE (Laughlin, Hodges, and Iraggi 2019; Goodyear 2020). Indeed, there are indications that video feedback can be equally effective for motor skill development as teacher feedback (Kok et al. 2019). Nevertheless, both research and practice using video feedback have been somewhat limited in scope, and dominated by a focus on isolated techniques, alongside student perceptions and motivation (Casey and Jones 2011; Hung, Young, and Lin 2017; Kretschmann 2017; O’Loughlin, Chróinín, and O’Grady 2013; Potdevin et al. 2018; Palao et al. 2013; Roure et al. 2019). Therefore, if new and emerging video feedback technologies are to realise their potential to support learning, a broader consideration of their pedagogical application and value should be pursued, developed, and debated (Casey, Goodyear, and Armour 2017).

Barriers to the use of video technology in PHE are driven by numerous questions which remain debated regarding the practical, pedagogical, and ethical nuances of its use. Such as, whether the positive effects on learning and student motivation (facilitators), outweigh the barriers such as organisation, time, teacher competencies, and personal relevance (Goodyear et al. 2017a; Kuklick and Harvey 2018; Palao et al. 2013). This is pertinent for so-called ‘opaque technologies’ (e.g. cameras or tripods), which take up space and/or provide technical challenges (Clark 2003; Kuklick and Harvey 2018). This type of physical integration is considered more challenging than less visible or transparent technology, as a larger pedagogical and organisational shift is often required (Koekoek and Van Hilvoorde 2018). Therefore, when investigating the implementation of emerging digital pedagogies in PHE, it is important to consider the practical challenges of technology integration alongside other outcome measures such as learning and motivation.

Pedagogical case studies have begun to answer this challenge by highlighting the diverse uses of technology in PHE, alongside contextual and interdisciplinary considerations for teachers (Casey, Goodyear, and Armour 2016). However, further work is needed in relation to video technology, and how practitioners can move beyond the narrow lens of technique analysis and explore how video technology can be used to support learning across multiple learning domains (i.e. cognitive and social). In response to this need, this study integrated video feedback with an established pedagogical approach, with a specific focus on how it can support interactive and social pathways of learning (see Koekoek et al. 2018; Light 2012).

Video technology in PHE

PHE teachers are taking advantage of more viable and diverse video feedback technologies to both demonstrate and review movement, with research seeking to further understand the level of structure and support needed to support motor skill development (Kok et al. 2019). Evidence shows that video feedback across varying levels of teacher support can have a comparatively small to significant positive impact on motor development – alongside strong indications that it can support more individualised learning in combination with student-centred pedagogy (Casey, Goodyear, and Armour 2016; Hung, Young, and Lin 2017; Kretschmann 2017; Potdevin et al. 2018).

Video feedback has been less prominent in team games in comparison to individual sports, with evidence from sports coaching indicating that video feedback in futsal and soccer can significantly improve game performance (Hadiana et al. 2020; Harvey and Gittins 2014). It can also support learners in improving their decision-making, with evidence showing that – when given the choice – learners watch the more positive aspects of their performance (van Maarseveen, Oudejans, and Savelsbergh 2018). Despite the comparatively low number of studies which use video feedback in

team games, there is evidence of feasibility and positive effects which justify further integration with existing pedagogical approaches.

Using video feedback with games based approaches

Games Based Approaches (GBAs) encompass a range of pedagogical models and pedagogical approaches such as Teaching Games for Understanding, Game Sense, Tactical Games Model and Play Practice (Bunker and Thorpe 1982; Launder 2001; Light 2004; Oslin and Mitchell 2006). While there is much heterogeneity between these, all GBAs emphasize the importance of active learning through small-sided, adapted, or modified games. Using an inquisitive process of problem-solving, teacher questioning and consequent student interactions manifest as a central facet of the learning process (Light 2012; Metzler 2017). The francophone literature provides a rich source of information regarding how to support student discussion in GBAs, with Gréhaigne and Godbout (1998) coining these teacher-facilitated verbal exchanges as the *débat d'idées* (*débat d'idées*). For example, Gréhaigne, Richard, and Griffin (2005) articulate how teachers can facilitate a critical and effective exchange of ideas through promoting a critical examination of problems, decisions, and solutions. Such interactions are posited to elevate student performance to a more conscious level and inform the collective negotiation and shared understanding of *action rules* (i.e. game plans) (Harvey and Jarrett 2013). While small experimental studies support the efficacy of using video feedback to support similar questioning and problems solving strategies, these have only been one-on-one interactions with a coach or researcher (García-González et al. 2013; Gil-Arias et al. 2015, 2019). The use of video feedback to support group problem-solving in GBAs (and in a PHE setting) is largely absent in the pedagogical literature.

Koekoek et al. (2018) were the first to practically theorise the use of a tagging application with GBAs to support the debate of ideas. Such applications allow specific aspects of the game to be captured (tagged) by students and stored on an iPad for instant review. Coupled with active and social methods of learning, the essence of using video tags as a stimulus for student-led debates is to capture what refer to as 'golden moments for feedback' (Hattie and Clarke 2019, 82) and stimulate critical discussion and understanding driven by a shared view of the game. While teacher interventions such as freezing gameplay and accompanying open-ended questioning are a key aspect of using these golden moments for learning within GBAs (Harvey and Light 2015; Light 2012), this technology shows potential to transform the effectiveness, frequency, and organisation of such reflective turns. Initial investigation has shown that video tagging did not support the accuracy of observation in a basketball setting, but it may improve how students come to an agreement and focus on learning objectives during the debate of ideas (Koekoek et al. 2019).

After taking into consideration recent findings within GBA's and applying them amongst developments in video technology used in PHE (see Koekoek and Van Hilvoorde 2018), the aim of this study was to explore how a Game Sense Approach (a widely used GBA) can be effectively integrated with video tagging and student-led debates. The secondary aim was to investigate the emergence of so-called 'action rules' (game plans) which emerge from these verbal exchanges. Building on these aims, and following suggestions made by previous scholars who have combined technology with an established pedagogical approach (Bodsworth and Goodyear 2017), the following methodology was used to answer the question; What are the barriers and facilitators of implementing a GBA which integrates video tagging and debate of ideas in Physical and Health Education?

Methodology

Participants

The participants were twelve male and five female ($n = 17$) 14–15-year-old students at a publicly funded International School in Sweden. This convenience sample was purposively chosen in favour

of the other class in the year group based on their familiarity with GBAs and experience using iPads in PHE. The students had not used the video tagging application previously, however, they had some familiarity filming their progress in a previous unit and using the stopwatch/timer functions.

All students were eligible to be part of the study and were informed of the purpose and process of the study by the research team during their weekly advisory class. They were given no incentives to join and understood that participation in the study would not affect their in-class experience or their grades. Informed consent was obtained in line with the Swedish Research Councils ethical guidelines (Swedish Research Council 2017); anonymity of participants was protected using pseudonyms.

Action research

Action research has been strongly advocated for as a method to promote informed pedagogical change and address the problematic divide between research and practice in PHE (Casey and Larson 2018). Further, it has been advocated for as a valuable tool which can illuminate the barriers and facilitators of technology integration in PHE (Bodsworth and Goodyear 2017; Casey, Goodyear, and Armour 2017). For this reason, and considering the practical nature of our research question, action research was deemed an appropriate method for this study – chiefly as a method to uncover the advantages of video tagging while also navigating emerging challenges.

Pragmatism was chosen as the underpinning research paradigm, as it largely reflects the day-to-day practices of teachers, where future actions are often based upon successful application in the classroom. The social constructivist epistemological beliefs of the researcher and the pedagogical approach were not ignored in this work, but viewed as a central aspect of the inquiry process. In practice, pragmatism supported an inquisitive, cyclical, and systematic search for knowledge, and the illumination of the teacher/researchers' thoughts and beliefs which were embraced, expressed, and aligned within the methodology (Morgan 2014).

Procedure

After consulting with colleagues, the PHE teacher planned an outline for the unit of work. They then followed a cyclical process of planning, teaching, and critical reflection to inform their practice (McNiff 2013).

The invasion games unit consisted of seven lessons (Table 1) and was a concluding unit in the schools PHE curriculum where students could build upon knowledge and skills obtained in previous years. Students had some experience using the skills and tactical concepts across the invasion sports. The unit was underpinned by a Game Sense approach, and the integration of video tagging was supported using an adaptation of the step-by-step process set out by Koekoek et al. (2018). Game Sense was selected amongst other GBAs such as Teaching Games for Understanding (Bunker and Thorpe 1982), as it places high emphasis on: the social nature of learning, learning skills through the game, and developing aspects of team play (Jarrett and Harvey 2016).

Before each lesson, the teacher made heterogeneous teams based on competence, experience, and gender. Each class began with a warmup-game, followed by PHE teacher interventions which consisted of questioning and game modifications to support learning. As part of the reflective action research cycles a debate-of-ideas was also added to this phase of the lesson after lesson three. In line with focus of the lesson, the teacher introduced which tags would be used in the observation of game performance. During the game, one player from each team observed the play and pressed the appropriate button(s) on the iPad¹ to record four to six-second video clips (see Figure 1). The tags varied each lesson and were dependent on the focus of the lesson (see Table 1). Between one and three tags were used in each lesson, ranging from concrete actions such as goals scored or conceded, to ambiguous actions such as good pass or questionable decision. Students rotated this role every two minutes through the sound of a buzzer in the gym. In line with guidance from Gréhaigne,

Table 1. Game types and lesson goals during the unit.

Lesson number	Type of game	Lesson goal	Game summary (used for tagging)	Tags
1	Pur Instinct 3v2 Game	Provide support to the player with the ball	A 3v2 rotation game with an endzone. Players must pass backwards but can kick or volley the ball forward.	Good support
2	Ultimate Frisbee	Supporting runs to penetrate space on attack	Offside rule: No standing in the endzone before the Frisbee is thrown.	Score Score attempt
3	Futsal	Improve awareness and facing goal/forwards	Small sided indoor football. Players of higher ability/experience limited to fewer touches.	Back to Goal Chest to Goal
4	Floorball	To develop team positioning, balance and identity	No modifications in the final game.	<i>Student Free Choice (the following tags were chosen)</i> Score Goal (all teams) Concede Goal (all teams) Good Balance (one team)
5	Basketball	Creating opportunities with ball movement	Half-court game. All shots needed to be from an assist. Defined as three seconds after a pass.	Score Attempt
6	Basketball	Vision, organisation, and communication on defense	Full court games in short intervals.	Open shot (opponent) (No tagging occurred this lessons)
7	Conditioned Invasion game	Draw on previous knowledge and reflect on decisions with the ball	A simple pass and move game with two endzones. A player must catch their teammates pass in the opponents endzone to score. Rules adapted throughout to increase tactical complexity and to revisit tactical concepts. E.g. volley the ball on the last pass to score.	Good Decision <i>Teams could also choose to tag</i> Questionable decision

**Figure 1.** An example of video tagging on a tripod with Dictaphone.

Richard, and Griffin (2005) teams then observed all the video clips captured from the game ‘tags’ and were asked to: (i) commentate on what they saw when they felt it was appropriate, (ii) summarise their observations, and (iii) devise a verbal plan of action based on both in-game and video

observations. During this time, the teacher rotated around each group and facilitated discussion when appropriate. Students were encouraged to – and consistently did – use the slow-motion feature in the application. They then returned to the game and implemented the agreed action rules for the remainder of the lesson.

After each lesson, the PHE teacher listened to the recorded student debates, completed an adapted post-teaching reflection analysis (PTRA), critically discussed findings with colleagues, and adjusted planning when necessary (Dyson 1994). The PTRA was chosen as it facilitated introspection from the teacher and students' perspective, alongside its previous impactful use in PHE action research (Bodsworth and Goodyear 2017; Casey, Dyson, and Campbell 2009).

The PTRA included the following reflection points: (i) What were the lesson goals for students and teachers? (ii) What did you see in your lesson that you met these goals? (iii) What were the most positive aspects of the class? (iv) What aspects did you feel did not go well? (v) What changes would you make to the lesson the next time you teach it? (vi) What were the learning outcomes? (vii) What are your specific goals for the next lesson? (viii) What strategies will help you achieve your goals?

During all planning and replanning video tagging and debate of ideas were central strategies utilised to address the following four key pedagogical elements of Game Sense: (i) learning through the game (ii) strategies to stimulate dialogue (iii) opportunities for active problem solving (iv) facilitating a supportive social environment (Light 2012).

Analysis

The teacher's reflections in response to the adapted reflective questionnaires informed collegial discussions and cycles of action research which underpinned pedagogical change during the unit. Reflections were then analysed *post-hoc* using NVivo 12 software following the six-step process of inductive thematic analysis: (i) familiarisation (ii) initial coding (iii) searching for themes (iv) reviewing themes (v) defining themes, and (vi) reporting (Braun and Clarke 2006). Reflexivity was central to this process, as the analysis of the teacher's PTRA reflections brought inevitable preconceptions of what they would find. Therefore, writing analytical memos throughout coding not only supported the trustworthiness of the analysis but provided an outlet to articulate and consequently understand preconceptions (Sparkes and Smith 2014). Discussion with the second author during this process encouraged the exploration of alternative coding pathways, and further supported the rigor of analysis and identification of themes (Smith and McGannon 2017).

To gain a more in-depth understanding of discussion and student learning, the recorded student-led debates were directly transcribed after the seven lessons. Following initial deductive analysis, the authors and collaborators read over the data, and through a process of deliberation (see Goodyear and Casey 2013), decided the best course of action was a deductive content analysis. This was a key aspect of understanding whether dialogue was approached constructively (Butera, Sommet, and Darnon 2019), and how action rules emerged through student-led debates. This resulted in eight coding criteria where student comments on each video clip were coded based on positive and negative feedback which targeted either the team or individual members. These comments were then coded based on whether they informed future actions (action rule) or not. Positive action rules were deemed to be that based on 'do' plans, for example: '*We should make shorter passes*'; negative feedback was based on the avoidance of actions or 'don't' plans in student dialogue, for example: '*I shouldn't shoot in from there*'.

Results

The following results were collected from an inductive analysis of teacher reflections and deductive analysis of student-led debates.

Table 2. Themes and subthemes from teacher reflections.

Theme	Subtheme	Subtheme description	Example quote
Organisation Reflections on how to organise the lesson to use video tagging.	Time & timing	Reflections on the lack of time to implement all aspects of the lesson. Reflections on when to start/stop the tagging process.	I did not give discussion time to the students when questioning but I will look to do this again in future. This is based on the need to keep the pace of the lesson and facilitate game play. The use of technology compounds this need as it takes a little extra time from the students experiencing gameplay.
	Technology	Consideration of the physical environment, where to place cameras and how to transition between technology use.	I do not have the space to tag a full court game, as the tripods would get in the way.
What to tag Reflections on how to implement tagging	Game Adaptations	Consideration of how to modify or adapt the game and tags to emphasize the learning focus.	Perhaps tapping into how to create scoring opportunities will be a way of tagging in the future.
	Debate of Ideas	Reflections on the content of student discussion and the implications of video tagging	I felt that the discussions fell back onto the decision of the player on the ball.
	Teacher Questioning	Reflections on how teacher questioning emerged within this pedagogical framework	I could have directed the conversation more strongly to the direction and timing of the runs.

Inductive analysis of teacher reflections

The inductive analysis of teacher reflections resulted in the construction of two themes: *organisation* and *what to tag* (see Table 2).

The theme of *organisation* became apparent through the challenges the teacher articulated regarding the practical integration of technology within a one-hour lesson, alongside challenges of when to meaningfully implement the video-guided student-led debates within that time. *What to tag* emerged through the ongoing interplay between the lesson focus, game adaptations, and the choice of tags as video stimulus for the debate of ideas. In the following sections samples of teacher reflections within each theme are included. Illustrative examples of student-led debates are also included, as these were influential in the teachers reflective process and pedagogical decision making.

Organisation

Teacher reflections indicated the importance of student familiarisation with both the technology and the pedagogical process surrounding it. This improved throughout the unit and the tagging process became a more seamless part of the lesson. Nevertheless, the teacher had an ongoing and partially unsolved challenge with the lack of time to implement plans constructed through the video-guided debates, and efforts to move this process earlier resulted in them rushing the initial stages of the one-hour lesson. Time pressure was further compounded by the high level of organisation required when using iPad to film and review performance (see Table 3).

The physical presence of the iPads and tripods further challenged smooth transitions between activities in the lesson. Planning where the tripods would be placed (and moved to) was also important concerning what students could observe, as the ball was sometimes too close or too far away from the camera. This was evidenced in numerous discussions where students struggled to see what was happening on the screen. Placing the iPads in the corners of the gym hall allowed for a high utilisation of playing space, however, this also challenged the teacher when seeking to facilitate the student debates and support any technical issues – as each group was remotely situated. Through considering *organisation*, the teacher found it easier to record the game and support student-led debates in a smaller playing area, where cameras were closer together in the middle of the gym hall (Lesson 5: half-court basketball games).

Table 3. Examples of teacher reflections related to organisation.

Lesson Number	Game type	Adaptations following teacher reflections
1	Pur Instinct 3v2 Game	N/A
2	Ultimate Frizbee	Increase the time for implementing action rules
3	Futsal	Increase the time for making plans
4	Floorball	Develop questioning and an additional tactical timeout at the start of the lesson. Students should sit in their teams while teacher asks questions in order for them to transition quickly and easily into a tactical timeout.
5	Basketball	Maintain the pace of the lesson in combination with multiple tactical timeouts. Tag earlier on in the lesson and allow the plans made through tagging to be massaged more through the lesson.
6	Basketball	No tagging due to lack of time .
7	Conditioned invasion game	Conduct an early debate of ideas to avoid rushing the process and giving less time for implementation of a strategy.

Despite careful consideration of the physical organisation of the lessons to save time, the teacher perceived that the students had an inadequate amount of time to tag. In part, this time pressure hindered the normative aspects of their Game Sense pedagogy. These included adapting the rules of the game based on observations, persevering with an adapted game for longer, adding an additional player to support both teams, changing the number of teams, and/or observing and pausing gameplay to questions students.

I need to be more hands-on with my questioning. I feel that the use of video is hindering me from making interventions and questions in other parts of the lesson.

Teacher Reflection (03/05/2019)

I am now beginning to see how it [video tagging] may be acting as a hinder. For example, I have not used an extra attacking player as I would have usually done, or had more than four teams and rotated.

Teacher Reflection (17/05/2019)

The teacher reflections show how the organisation of the lesson was largely situated around the video tagging, and the interdependent organisation of space, equipment, and learning. For example,

I conducted an extra debate of ideas during the warm-up game. This helped to nurture the team and problem-solving culture. It made the debate of ideas and observation of video less alien to them, as it became an addition to the reflective processes they were already following [when tagging].

Teacher Reflection (09/05/2019)

The theme of organisation showed how the teacher navigated additional layers of complexity, which included the effective sequencing of activities to effectively integrate Game Sense pedagogy and video tagging.

What to tag

Teacher reflections began with their uncertainty whether to tag successful or unsuccessful actions, and their initial examination of student debates expressed that they lacked the critical debate and interaction which they sought to stimulate. When listening to the first recorded student-led debates, the teacher found that the most able students were commenting on their own clips while less able students were mostly non-present in the video tags and discussions. Their collegial discussions promoted them to find ways to avoid highlighting mistakes but seeking to include all students.

A more positive approach, which may then model behaviour, is more beneficial when considering the age and self-esteem of the students ... it may be more beneficial for students to bring up mistakes as opposed to mistakes forced upon the student by the teacher.

Teacher Reflection (26/04/2019)

However, this did not become immediately apparent in practice, and they then justified the use of non-successful behaviours (as tags) to promote more student debate. This, for example, included

tagging losses of possession. This approach proved unsuccessful, and an equitable exchange of critical ideas did not become apparent. As shown in the example below, action rules (game plans) often emerged from a suggestion, followed by short affirmations of agreement from teammates.

- Student 1: Ok, this was a bad one but if we could improve, uhm maybe.
 Student 2: I guess (Student 4) could come a little closer.
 Student 3: Yeah.
 Student 1: Yeah.
 Student 4: Oh yeah, I see.

Student discussion (02/05/2019)

Indeed, most student-led debates show a high level of agreement with a clear leader in each discussion – generally those with higher task competence (see Barker and Quennerstedt 2016). While the inclusion of ‘non-success’ tags did not increase the level of interaction and debate, neither did it increase the amount of negative feedback in student discussion (see Table 4).

As the lessons progressed the teacher further considered the relationship between video tags, the lesson focus, and how to stimulate a debate which balanced critical and meaningful verbal exchanges; this resulted in students choosing their own tags.

I felt that giving the students a choice on what to tag engaged in them with the technology and gave them all easily came up with what they wanted to see from the game. It was interesting to see that 3 groups wanted to observe conceded goals, with some groups choosing to also observe goals scored.

Teacher Reflection (10/05/2019)

In this lesson student engagement was high, and discussions show how teams noticed trends in performance such as not getting back on defence (Teacher reflection 11/05/2019).

- Student 1: Ok this is more of them on our side than us.
 Student 2: Yeah.
 Student 1: So they are overpowering us because there is more of them than us, so we can't really do much. Here you can see whoever gets through, and it gets to them.
 Student 2: Yeah.

Student discussion (10/05/2019)

These observations lead to the team developing concrete action rules for their return to the game.

- Student 4: So, when we attack we need to run back.
 Student 2: Yeah, exactly we, everyone needs to run back.
 Student 1: Everyone has to get back, basically.
 Student 3: And the goalie has to try and stay in goal.

Student discussion (10/05/2019)

In an effort to move away from successful and unsuccessful tags and including a diverse enough group of clips to facilitate more discussion, the most successful alignments of tags, game modifications and objectives were in lesson five (basketball, see Table 1). In this lesson, all shots in a half-court game were tagged and the game modification required that every attempt be assisted (a shot within three seconds of a pass). This approach directed discussions towards the lesson focus: creating opportunities to score with ball movement, and away from a dyadic approach to mistakes and success which was present when using value-laden tagging. In this lesson, the teacher observed more students taking opportunities to shoot and student discussion demonstrated the creation of specific action rules. For example,

- Student 1: Someone could have run out here, maybe in front, and then Alex could have passed.
 Student 2: Uhm, like, we people can take shots from the side but just try look for people who are, like, further up.
 Student 1: Usually its easier for someone to run into a good passing spot, like an open space which is an easy pass angle.
 Student 2: Yeah and then everybody is, like, back there, so it's open

Student discussion (16/05/2019)

Table 4. The frequency of feedback and action rules for individuals and teams.

Type of feedback	Action rule	Focus of student discussion	Number of comments
Positive feedback	With Action Rule 'Do plans'	Team	30
		Individual	10
	Without Action Rule	Team	11
Negative feedback	With Action Rule 'Don't plans'	Individual	13
		Team	0
	Without Action Rule	Individual	1
		Team	4
		Individual	1

Overall, the theme of what to tag represents the teacher's ongoing reflection around how they could frame the tagging process to support learning through the debate of ideas and the lesson focus.

Deductive analysis of student-led debates

The deductive analysis of recorded student-led debates shows that over half of student feedback included action rules (Table 4).

There was a clear preference for positive feedback, and team-based action rules. Positive feedback without an action rule included comments such as:

I like the movement of Harry because he saw the movement of Alex right in front of him and Harry immediately went behind. Here Harry runs behind which shows good off the ball movement.

Student discussion (02/05/2019)

This comment was based on an individual's performance and provided positive feedback and affirmation, yet there is no indication of a clear plan for performance (without action rule). In the following example the analysis of performance led to a positive team-based action rule.

Student 1: Yeah but we were spaced out, we didn't really stand where the other person stands, we moved around, even though we weren't organised defensively we were sticking to the other person.

Student 2: The goalie can come up more.

Student 3: Yeah.

Student discussion (10/05/2019)

Agreeing to push the goalkeeper further forward is a clear plan to act.

The analysis focused on discussion around each video clip and sought to identify the overall conclusion of the discussion. The following example shows how the initial two comments could have been deemed as negative feedback (individual), however, the final comments from this short analysis reframed it to positive feedback with an action rule for an individual student.

Student 1: So that was bad coordination.

Student 2: So there I should have seen you run, like, a bit to the side.

Student 1: Well wait a bit before you throw.

Student discussion (03/05/2019)

Overall, this analysis highlighted how groups were able to make plans for action by referring to the video clips. Students focused heavily on what the team should do and spoke very little about inhibiting aspects of their performance.

Discussion

In line with recent curricular changes in Sweden which mandate the use of digital tools to plan, implement, and evaluate performance (Swedish Department of Education 2019), this study has

highlighted how PHE teachers can consider the systematic, reflective, and collegial processes of action research to support the meaningful use of new pedagogical approaches in their lessons (Goodyear and Dudley 2015). Through the paradigm of pragmatism, action research provided a framework to explore the process of integrating and aligning the tagging process – and encouraged the teacher to endure beyond the challenges of the initial lessons (McNiff 2013; Morgan 2014). Analysis of reflections provided further depth and rigor to the process of unpacking the barriers and facilitators of this approach and the interplay between teaching, learning and technology (Casey, Goodyear, and Armour 2017). These are relevant considerations for PHE teachers who wish to integrate video feedback technology in their lessons – most prominently how challenges of timing and organisation may emerge and how tagging can be suitably framed to support learning.

Barriers

Organisation of space, time, and learning experiences were clear barriers that the PHE teacher faced during this process. This included them feeling hindered to conduct ‘the usual’ open-ended questioning strategies or to reorganise the number of teams. The addition of shorter student-led debates in the beginning of the lesson highlighted the importance of student familiarity with prosocial aspects of Game Sense Pedagogy, and the continued effort of the teacher to place ‘pedagogy *before* technology’ (Casey, Goodyear, and Armour 2017). While familiarity with technology is also an important part of successful integration (Kuklick and Harvey 2018), this process showed how this was equally significant in relation to new pedagogical approaches. Starting slow, and building in new pedagogical elements (see Casey and MacPhail 2018) before the addition of video-tagging may have better supported the teacher to overcome the barriers of organisation. For example, the process of observation and team debate could initially be conducted without iPads.

Even though student familiarity with pedagogy and technology occurred, the results emphasise how time and timing are integral to the successful alignment of Game Sense and video-tagging. For example, the results show how the teacher was diagnosing student learning needs through observation, but the time-pressured process of video tagging limited how they responded to their needs (see Goodyear, Kerner, and Quennerstedt 2017b). If the teacher is to be an activator of learning and work towards the core aspirations of Game Sense, students require further opportunities to receive guidance from the teacher and to implement and evaluate their plans over time (see Light 2012, 48).

Both themes highlight how the sound organisation of the lesson, and adequately responding to students learning needs through methods of feedback and questioning are a foundation that needs to be established before relevant tags and student-led debate are conducted. This further emphasises the advice given by Koekoek et al. (2018) regarding how students require time to familiarize themselves with the game. In practice, this suggests that the pedagogical process adapted from Koekoek et al. (2018) would be most effective across a two to four-lesson cycle.

Facilitators

The results show that video tagging can support student-led debates which facilitate positive team-based action rules and how thoughtful consideration needs to be given to how learning is organised. Effective and meaningful alignment of video feedback with other pedagogical elements within a GBA was a central aspect apparent in the themes, and highlights the importance of addressing where pedagogical and technological knowledge intersect (see Mishra and Koehler 2006).

The teachers’ iterative process of planning and choosing tags through action research helped them to consider *what to tag* and its implications. For example, a value-laden approach to observation was deemed problematic regarding inclusion and student debate, and a more simplistic process of tagging one specific moment in the game (e.g. all shots) became apparent as a promising

method to produce dynamic and equitable discussion which support positive action rules. While beyond the scope of the analysis, a focus on inclusive tagging acted as a promising method to reduce the dominance of those with higher task competence in discussions (see Barker, Wallhead, and Quennerstedt 2016). This method may also be chosen in relation to the accuracy of student tags – which have been questioned in previous studies (Koekoek et al. 2014).

The students' supported each other in their discussions and teams moved beyond the identification of weaknesses and towards positive action rules. These findings show how video feedback supported positive interactions and discussions – which is a central facet of Game Sense and its design for learning (Light 2012). Nevertheless, student awareness that they were being recorded (i.e. demand characteristics) may have impacted the results, and is an important aspect to consider in relation to the implications of the findings.

The pedagogical value of using video tags has been articulated in relation to their potential ability to record 'golden moments for feedback' (Hattie and Clarke 2019) and as a stimulus for student-led debates. The analysis of the student-led debates showed that not all moments for discussion were indeed 'golden', however they helped to focus discussions on specific game elements and facilitated feedback. The results further show how students were able to observe trends in their performance through the observation of video tags, and the student-led debates provided ample feedback which largely aligned with lesson goals. Therefore, when teachers and coaches wish to observe specific game moments and/or help students to observe and identify trends in their performance they can consider video-tagging as a viable approach.

Conclusions

Through exploring the use of video-tagging in an invasion games unit, this study has shown how video tags can support the ongoing articulation of specific individual and team-based action rules. Video-tagging can provide an insightful stimulus for the debate of ideas when tags are aligned with lesson objectives. The content of student interactions captured in this study also provide insights into how the debate of ideas emerges in lessons.

When adopting this approach, teachers are encouraged to remain cognisant of the organisational and pedagogical challenges that were faced in this study, and to consider the relationship between pedagogy and technology (Casey, Goodyear, and Armour 2017, 2016). For example, a key consideration for teachers is balancing the need to design the right teaching moments to effectively use video tagging, against the advantages of student and teacher familiarity achieved through consistent use. Overall, the themes in this study highlight the complexity of technology integration, and the need to carefully consider when and how tags can provide insights for learning.

This study was conducted with students in a mixed-gender class who had prior experience of the sports and the use of the iPad in PHE. If a different or larger sample of students and teachers were used the pedagogical adaptations and key considerations may have differed. It is therefore important to continue to explore the practical implementation of this approach in different contexts. The use of real-time data from student-led discussion has shed light on how students engage in discussion largely independent of the teacher. However, this study did not investigate student perspectives of video tagging, which may limit the understanding of acceptability and feasibility in other contexts. Information on the implementation of action rules and the facilitation of responses from students who do not actively contribute to discussions would further inform the efficacy of this approach. For example, Participatory Action Research (PAR) would add value and insight to the transferability of findings, and future research may consider methods which empower student voice in the transformation of practice (Ax, Ponte, and Brouwer 2008; Bodsworth and Goodyear 2017). Overall, further iterations of research-in-action which address student perspectives and the challenges of time and organisation will provide the framework for valid experimental study designs.

Quasi-experimental and mixed-methods approaches could be an alternative way to investigate video tagging in GBAs. Most notably, how video tagging mediates potential changes in knowledge

and performance. For this purpose, further studies could be conducted over a longer time and use video tags to develop methods of assessing the relationship between knowledge-in-speech and action (see Harvey, Cope, and Jones 2014). This could also include the analysis of video tags (accuracy and content), student-led discussions, and performance.

Note

1. A fish-eye lens was attached to each iPad camera.

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References

- Ax, Jan, Petra Ponte, and Niels Brouwer. 2008. "Action Research in Initial Teacher Education: An Explorative Study." *Educational Action Research* 16 (1): 55–72. doi:10.1080/09650790701833105.
- Barker, Dean, and Mikael Quennerstedt. 2016. "Power and Group Work in Physical Education." *European Physical Education Review* 23 (3): 339–353. doi:10.1177/135633615620716.
- Barker, Dean, Tristan Wallhead, and Mikael Quennerstedt. 2016. "Student Learning Through Interaction in Physical Education." *European Physical Education Review* 23 (3): 273–278. doi:10.1177/135633616640235.
- Bodsworth, Hannah, and Victoria A. Goodyear. 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. doi:10.1080/17408989.2017.1294672.
- Braun, Virginia, and Victoria Clarke. 2006. "Using Thematic Analysis in Psychology." *Qualitative Research in Psychology* 3 (2): 77–101. doi:10.1191/1478088706qp063oa.
- Bunker, David, and Rod Thorpe. 1982. "A Model for the Teaching of Games in Secondary Schools." *Bulletin of Physical Education* 18 (1): 5–8.
- Butera, Fabrizio, Nicolas Sommet, and Céline Darnon. 2019. "Sociocognitive Conflict Regulation: How to Make Sense of Diverging Ideas." *Current Directions in Psychological Science* 28 (2): 145–151. doi:10.1177/0963721418813986.
- Casey, Ashley, Ben Dyson, and Anne Campbell. 2009. "Action Research in Physical Education: Focusing Beyond Myself Through Cooperative Learning." *Educational Action Research* 17 (3): 407–423. doi:10.1080/09650790903093508.
- Casey, Ashley, Victoria A Goodyear, and Kathleen M Armour. 2016. "Rethinking the Relationship Between Pedagogy, Technology and Learning in Health and Physical Education." *Sport, Education and Society* 22 (2): 288–304. doi:10.1080/13573322.2016.1226792.
- Casey, Ashley, Victoria A Goodyear, and Kathleen Armour. 2017. *Digital Technologies and Learning in Physical Education: Pedagogical Cases*. London: Routledge.
- Casey, Ashley, and Benjamin Jones. 2011. "Using Digital Technology to Enhance Student Engagement in Physical Education." *Asia-Pacific Journal of Health, Sport and Physical Education* 2 (2): 51–66. doi:10.1080/18377122.2011.9730351.

- Casey, Ashley, and Håkan Larsson. 2018. “‘It’s Groundhog Day’: Foucault’s Governmentality and Crisis Discourses in Physical Education.” *Quest (grand Rapids, Mich)* 70 (4): 438–455. doi:10.1080/00336297.2018.1451347.
- Casey, Ashley, and Ann MacPhail. 2018. “Adopting a Models-Based Approach to Teaching Physical Education.” *Physical Education and Sport Pedagogy* 23 (3): 294–310. doi:10.1080/17408989.2018.1429588.
- Clark, Andy. 2003. *Natural Born Cyborgs: Minds, Technologies, and the Future of Human Intelligence*. New York: Oxford University Press.
- Dyson, Ben. 1994. A case study of two alternative elementary physical education programs [Unpublished doctoral dissertation]. Ohio State University.
- García-González, Luis, M. Perla Moreno, Alberto Moreno, Alexander Gil, and Fernando del Villar. 2013. “Effectiveness of a Video-Feedback and Questioning Programme to Develop Cognitive Expertise in Sport.” *PLoS One* 8 (12): e82270, 1–12. doi:10.1371/journal.pone.0082270.
- Gil-Arias, Alexander, Luis García-González, Fernando Del Villar, Alberto Moreno, and M. Perla Moreno. 2015. “Effectiveness of Video Feedback and Interactive Questioning in Improving Tactical Knowledge in Volleyball.” *Perceptual and Motor Skills* 121 (3): 635–653. doi:10.2466/30.PMS.121c239.
- Gil-Arias, A., L. Garcia-Gonzalez, F. Del Villar Alvarez, and D. Iglesias Gallego. 2019. “Developing Sport Expertise in Youth Sport: A Decision Training Program in Basketball.” *PeerJ* 7: e7392, 1–19. doi:10.7717/peerj.7392.
- Goodyear, Victoria. 2020. “Using Digital Technologies to Support Learning in Physical Education.” In *Learning to Teach Physical Education in the Secondary School: A Companion to School Experience*, edited by Susan Capel, Joanne Cliffe, and Julia Lawrence, 306–321. New York: Routledge.
- Goodyear, Victoria A, Dylan Blain, Thomas Quarmby, and Nalda Wainwright. 2017a. “Dylan: The use of Mobile Apps Within a Tactical Inquiry Approach.” In *Digital Technologies and Learning in Physical Education: Pedagogical Cases*, edited by A. Casey, V. A. Goodyear, and K. M. Armour, 13–30. New York: Routledge.
- Goodyear, Victoria A., and Ashley Casey. 2013. “Innovation with Change: Developing a Community of Practice to Help Teachers Move Beyond the ‘Honeymoon’ of Pedagogical Renovation.” *Physical Education and Sport Pedagogy* 20 (2): 186–203. doi:10.1080/17408989.2013.817012.
- Goodyear, Victoria, and Dean Dudley. 2015. “‘I’m a Facilitator of Learning!’ Understanding What Teachers and Students Do Within Student-Centered Physical Education Models.” *Quest (grand Rapids, Mich)* 67 (3): 274–289. doi:10.1080/00336297.2015.1051236.
- Goodyear, Victoria A., Charlotte Kerner, and Mikael Quennerstedt. 2017b. “Young People’s Uses of Wearable Healthy Lifestyle Technologies; Surveillance, Self-Surveillance and Resistance.” *Sport, Education and Society* 24 (3): 212–225. doi:10.1080/13573322.2017.1375907.
- Gréhaigne, Jean-Francis, and Paul Godbout. 1998. “Observation, Critical Thinking and Transformation: Three Key Elements for a Constructivist Perspective of the Learning Process in Team Sport.” In *Education for Life, Proceedings of the AIESEP World Sport Science Congress*, edited by R Feingold, C Roger Rees, G.T Barette, L Fiorentino, S Virgilio, and E Kowalski, 109–118. New York: Adelphi University Press.
- Gréhaigne, Jean-Francis, Jean-François Richard, and Linda L. Griffin. 2005. *Teaching and Learning Team Sports and Games*. New York: Routledge-Falmer.
- Hadiana, Oman, Ribut Wahidi, Sartono Sartono, and Boby Agustan. 2020. “The Impact of Video Feedback Toward Futsal Playing Skills.” In *Proceedings of the 4th International Conference on Sport Science, Health, and Physical Education (ICSSHPE 2019)*, 68–70. Atlantis Press.
- Harvey, Stephen, Edward Cope, and Ruan Jones. 2014. “The Body Thinking: Assessment in Game-Centred Approaches to Teaching and Coaching.” In *Contemporary Developments in Games Teaching*, edited by Richard Light, John Quay, Stephen Harvey, and Amanda Mooney, 178–192. New York: Routledge.
- Harvey, Stephen, and Christopher Gittins. 2014. “Effects of Integrating Video-Based Feedback Into a Teaching Games for Understanding Soccer Unit.” *AGORA for Physical Education and Sport* 16: 271–290.
- Harvey, Stephen, and Kendall Jarrett. 2013. “A Review of the Game-Centred Approaches to Teaching and Coaching Literature Since 2006.” *Physical Education and Sport Pedagogy* 19 (3): 278–300. doi:10.1080/17408989.2012.754005.
- Harvey, Stephen, and Richard L. Light. 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. doi:10.1080/18377122.2015.1051268.
- Hattie, John, and Shirley Clarke. 2019. *Visible Learning: Feedback*. New York: Routledge.
- Hung, Hui-Chun, Shelley Shwu-Ching Young, and Kuo-Chin Lin. 2017. “Exploring the Effects of Integrating the iPad to Improve Students’ Motivation and Badminton Skills: A WISER Model for Physical Education.” *Technology, Pedagogy and Education* 27 (3): 265–278. doi:10.1080/1475939x.2017.1384756.
- Jarrett, Kendall, and Stephen Harvey. 2016. “Similar, but not the Same: Comparing the Game Based Approaches of Teaching Games for Understanding (TGfU) and Game Sense.” *Ejournal de la Recherche sur L’intervention en éducation Physique et Sport – eJRIEPS* 38 (April): 92–113. doi:10.4000/ejrieps.900.
- Koekoek, Jeroen, John Van Der Kamp, Wytse Walinga, and Ivo Van Hilvoorde. 2019. “Exploring Students’ Perceptions of Video-Guided Debates in a Game-Based Basketball Setting.” *Physical Education and Sport Pedagogy* 24 (5): 519–533. doi:10.1080/17408989.2019.1635107.

- Koekoek, Jeroen, Hans van der Mars, John van der Kamp, Wytse Walinga, and Ivo van Hilvoorde. 2018. "Aligning Digital Video Technology with Game Pedagogy in Physical Education." *Journal of Physical Education, Recreation & Dance* 89 (1): 12–22. doi:10.1080/07303084.2017.1390504.
- Koekoek, Jeroen, and Ivo Van Hilvoorde. 2018. *Digital Technology in Physical Education: Global Perspectives*. New York: Routledge.
- Koekoek, Jeroen, Ivo Van van Hilvoorde, John van der Kamp, Annelies Knoppers, and Wytse Walinga. 2014. "Accuracy and Reliability of Tagging and Video Feedback to Enhance Tactical Knowledge: Student's Perspectives within a TGfU Basketball Setting".
- Kok, Marjan, Annet Komen, Laurien van Capelleveen, and John van der Kamp. 2019. "The Effects of Self-Controlled Video Feedback on Motor Learning and Self-Efficacy in a Physical Education Setting: An Exploratory Study on the Shot-put." *Physical Education and Sport Pedagogy* 25 (1): 49–66. doi:10.1080/17408989.2019.1688773.
- Kretschmann, Rolf. 2017. "Employing Tablet Technology for Video Feedback in Physical Education Swimming Class." *Journal of E-Learning and Knowledge Society* 13 (2): 103–115. doi:10.20368/1971-8829/1322.
- Kuklick, Clayton, and Stephen Harvey. 2018. "Developing Physical Educators' Knowledge of Opaque and Transparent Technologies and its Implications for Student Learning." In *Digital Technology in Physical Education: Global Perspectives*, edited by Jeroen Koekoek, and Ivo van Hilvoorde, 146–164. New York: Routledge.
- Laughlin, Michael K., Michael Hodges, and Taylor Irraggi. 2019. "Deploying Video Analysis to Boost Instruction and Assessment in Physical Education." *Journal of Physical Education, Recreation & Dance* 90 (5): 23–29. doi:10.1080/07303084.2019.1580637.
- Lauder, Alan G. 2001. *Play Practice: The Games Approach to Teaching and Coaching Sports*. Champaign, IL: Human Kinetics.
- Light, Richard L. 2004. "Coaches' Experiences of Games Sense: Opportunities and Challenges." *Physical Education and Sport Pedagogy* 9 (2): 115–131. doi:10.1080/1740898042000294949.
- Light, Richard L. 2012. *Game Sense: Pedagogy for Performance, Participation and Enjoyment*. New York: Routledge.
- McNiff, Jean. 2013. *Action Research: Principles and Practice*. London: Taylor & Francis Group.
- Metzler, Michael. 2017. *Instructional Models in Physical Education*. New York: Routledge.
- Mishra, Punya, and Matthew J. Koehler. 2006. "Technological Pedagogical Content Knowledge: A Framework for Teacher Knowledge." *Teachers College Record* 108 (6): 1017–1054.
- Morgan, David L. 2014. "Pragmatism as a Paradigm for Social Research." *Qualitative Inquiry* 20 (8): 1045–1053. doi:10.1177/1077800413513733.
- O'Loughlin, Joe, Deirdre Ní Chróinín, and David O'Grady. 2013. "Digital Video: The Impact on Children's Learning Experiences in Primary Physical Education." *European Physical Education Review* 19 (2): 165–182. doi:10.1177/1356336(13486050).
- Oslin, J., and S. Mitchell. 2006. "Game-Centred Approaches to Teaching Physical Education." In *The Handbook of Physical Education*, edited by D. MacDonald, D. Kirk, and M. O'Sullivan, 627–651. London: Sage.
- Palao, Jose Manuel, Peter Andrew Hastie, Prudencia Guerrero Cruz, and Enrique Ortega. 2013. "The Impact of Video Technology on Student Performance in Physical Education." *Technology, Pedagogy and Education* 24 (1): 51–63. doi:10.1080/1475939x.2013.813404.
- Potdevin, F., O. Vors, A. Huchez, M. Lamour, K. Davids, and C. Schnitzler. 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. doi:10.1080/17408989.2018.1485138.
- Roure, Cédric, Jacques Méard, Vanessa Lentillon-Kaestner, Xavier Flamme, Yves Devillers, and Jean-Philippe Dupont. 2019. "The Effects of Video Feedback on Students' Situational Interest in Gymnastics." *Technology, Pedagogy and Education* 28 (5): 563–574. doi:10.1080/1475939x.2019.1682652.
- Smith, Brett, and Kerry R. McGannon. 2017. "Developing Rigor in Qualitative Research: Problems and Opportunities Within Sport and Exercise Psychology." *International Review of Sport and Exercise Psychology* 11 (1): 101–121. doi:10.1080/1750984x.2017.1317357.
- Sparkes, Andrew C, and Brett Smith. 2014. *Qualitative Research Methods in Sport, Exercise and Health*. London: Routledge.
- Swedish Department of Education. 2019. *Curriculum for Compulsory School, Preschool Class and After-School Center: Revised in 2019*. Stockholm: Skolverket.
- Swedish Research Council. 2017. *Good Ethical Practice*. Stockholm: Vetenskapsrådet.
- van Maarseveen, Mariëtte J. J., Raoul R. D. Oudejans, and Geert J. P. Savelsbergh. 2018. "Self-controlled Video Feedback on Tactical Skills for Soccer Teams Results in More Active Involvement of Players." *Human Movement Science* 57:194–204. doi:10.1016/j.humov.2017.12.005.