Digital Transformation of a Diagnostic Procedure for Swimming Skill Analysis: Teachers' Evaluation of a Low-Fidelity App Prototype (Click Dummy) of the 'Owl's Eye'

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Abstract: Physical education teachers are challenged with accurately analysing their learners' swimming skills in order to design appropriate swimming lessons. To support them in this task, the 'Owl's Eye' diagnostic procedure was developed and evaluated. The 'Owl's Eye' systematically evaluates basic aquatic skills and easily performs an initial classification of learners' skills in their first swimming lessons. Following the successful testing of the paper-based version, the 'Owl's Eye' was further developed in digital form as part of a project funded by the Federal Ministry of Research, Technology and Space (BMFTR). The aim of this study is to investigate users' perspectives on the app prototype. To this end, interactions with a click dummy were captured using 'think-aloud' protocols and subsequently analysed by means of a qualitative analysis. The findings show that the app prototype was predominantly evaluated positively in terms of its design, usefulness, and effectiveness in dealing with limited teaching time. At the same time, suggestions for improvement were made, such as clearer navigation, an introductory video, and the ability to use functions offline. Overall, the findings of this study suggest that the digital transformation of the 'Owl's Eye' procedure further facilitates teachers' diagnostic work in school swimming lessons.

Keywords: app development, digital transformation, motor skill assessment, physical education, school swimming lessons, teacher education

Digitale Transformation eines Diagnoseverfahrens zur Analyse des schwimmerischen Könnens – Evaluation eines Low-Fidelity-App-Prototyps (Click Dummy) des »Eulenblicks« durch Lehrkräfte

Zusammenfassung: Sportlehrkräfte stehen vor der Herausforderung, das schwimmerische Können ihrer Lernenden genau zu analysieren, um einen passgenauen Schwimmunterricht zu gestalten. Um sie dabei zu unterstützen, wurde das Diagnoseverfahren »Eulenblick« entwickelt und evaluiert. Mit dem »Eulenblick« kann systematisch das schwimmerische Können der Lernenden analysiert werden, er ermöglicht eine einfache Klassifizierung der Lernenden in ihren ersten Schwimmstunden. Nach der erfolgreichen Evaluation der papierbasierten Version wurde der »Eulenblick« im Rahmen eines vom Bundesministerium für Forschung, Technologie und Raumfahrt (BMFTR) geförderten VIP+ Validierungsprogramms in digitaler Form weiterentwickelt. Ziel der Studie ist, die Perspektiven der Nutzenden auf den App-Prototypen zu untersuchen. Dazu wurde der Umgang mit einem Click Dummy mithilfe von »Think-Aloud«-Protokollen erhoben und anschließend anhand einer qualitativen Inhaltsanalyse ausgewertet. Die Ergebnisse zeigen, dass die App u.a. hinsichtlich ihres Designs, ihrer Nützlichkeit und ihrer Effektivität im Umgang mit begrenzter Unterrichtszeit überwiegend positiv bewertet wurde. Gleichzeitig wurden Verbesserungsvorschläge gemacht, wie eine klarere Navigation, ein Einführungsvideo und die Möglichkeit, Funktionen offline zu nutzen. Insgesamt deuten die Ergebnisse dieser Studie darauf hin, dass die digitale Transformation des »Eulenblick«-Verfahrens das diagnostische Handeln der Lehrkräfte im Schwimmunterricht weiter vereinfacht.

Schlagwörter: App-Entwicklung, Ausbildung von Sportlehrkräften, Bewertung sportmotorischer Fertigkeiten, Digitale Transformation, schulischer Schwimmunterricht

Digital Transformation of a Diagnostic Procedure for Swimming Skill Analysis: Teachers' Evaluation of a Low-Fidelity App Prototype (Click Dummy) of the 'Owl's Eye'

1 Introduction

It is well-accepted that the objective of (school) swimming lessons is to enhance learners' swimming competence in order to prevent drownings and to foster a lifelong engagement in all aquatic activities (Mekkaoui et al., 2025). The conditions for implementing appropriate swimming lessons are challenging in many ways. In addition to often very limited teaching time, the diversity of learners' swimming skills is one of the main challenges. While some primary school children can already swim before they start swimming lessons at school, others – even at secondary school – may have limited experience of swimming, be unable to swim, or even be afraid of the water (DLRG, 2022). In order to provide the best possible support for all learners, especially those who cannot yet swim, it is crucial to ensure that swimming lessons are adapted to the learner's individual swimming skill level and provide opportunities for learning growth (Mekkaoui et al., 2022). This requires a high level of didactic and methodological competence on the part of the physical education (PE) teachers, but also an accurate analysis of the learners' swimming skills at the beginning of the swimming lessons.

Typically, learners are simply classified as either swimmers or non-swimmers (Fokken et al., 2023, see Appendix 1). But for the purpose of adaptive lesson structuring, it is insufficient to merely ascertain whether or not the learners can swim (e.g., by determining their ability to swim an assigned distance in deep water or a certain quality of stroke technique). In order to learn to swim properly, children must master different phases. Firstly, they must become familiar with the water. Once this initial habituation phase is complete, they must learn basic aquatic skills. This includes being able to fully submerge, breath rhythmically, float on the front and back and glide with reduced drag (Bissig & Gröbli, 2004; Wilke & Daniel, 2007). Once this phase is reached, children can learn elementary water locomotion and, based on this, the well-known swimming stroke techniques (Rheker, 2011). As these skills form the foundation of comprehensive aquatic education (Costa et al., 2012; Langendorfer & Bruya, 1995), they require particular attention during the diagnostic process.

There are some validated instruments available for assessing children's actual aquatic skills, such as the SMACC[1] (Moreno Murcia et al., 2020), the AAST[2] (Mertens

1 Scale to Measure Aquatic Competence in Children

2 Actual Aquatic Skills Test

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et al., 2021), and the SCAS[3] (Sundan et al., 2023). However, as these instruments were primarily developed for research purposes, they are only partially suitable for everyday use in school swimming lessons due to their methodological requirements.

To address this issue and explore ways to support PE teachers in their diagnostic work, the 'Owl's Eye' procedure for analysing swimming skills was developed, based on the 'Assessment of Basic Aquatic Skills' (ABAS, Vogt & Staub, 2020). The ABAS was designed to be easy to apply and reliable, and has been validated among coaches, teachers, students and parents with varying levels of experience in teaching swimming. However, the ABAS comprises a total of 19 test tasks. Although the ABAS does not require a complicated experimental setup, it is still too time-consuming to be practical for use in schools. Nevertheless, it is precisely in schools that the 'Owl's Eye' is intended to be used.

To this end, the number of ABAS test tasks has been reduced and restructured. This enables an initial classification of learners' skills to be carried out using only five core tasks (e.g., Which learners are able to fully submerge, or float on their front and back?). These five core tasks are complemented by a combined task test to verify the children's ability to swim in deep water. In addition to the small number of tasks required for an initial analysis of swimming skills, what makes the 'Owl's Eye' procedure special is that it is directly linked to a didactic framework for comprehensive swimming education (Staub & Fokken, 2020). This allows teachers to immediately classify children into one of five colour-coded phases and develop support measures. This could encourage more teachers to use the 'Owl's Eye' as a diagnostic tool in their swimming lessons.

As well as ensuring that motor competence assessment tools are valid and reliable for the population in which they are used, it is also important that they are feasible for the intended users, such as teachers (Lander et al., 2015). Consequently, the 'Owl's Eye' was subjected to an evaluation of its feasibility and teachers' subjective value at an early stage in the development phase (Fokken et al., unpublished findings currently under review, see Appendix 2). A total of 72 teachers (N = 14 in a qualitative pre-study and N = 58 in a quantitative questionnaire) therefore tested the 'Owl's Eye' (paper-pencil-version) in practice and then evaluated the procedure. For this purpose, teachers were provided with a manual and prepared documentation sheets for recording learners' swimming skills. The procedure was generally well received. The majority of teachers evaluated it as useful and valuable for analysing learners' swimming skills. For instance, 83.3%[4] of respondents agreed with the statement that the 'Owl's Eye' is a reliable method of gathering diagnostic information for planning appropriate swimming lessons, selecting 'correct' (64.8%) or 'rather correct' (18.5%). As high-quality data is fundamental to determining

3 Swimming Competence Assessment Scale

4 All percentages reported here refer to the quantitative study involving 58 participants.

learners' current skills and support needs (Jäger, 2009; Leuders et al., 2020; van Ophuysen et al., 2013), the improvement in data collection perceived when using the 'Owl's Eye' is particularly significant. Furthermore, 75.4% ('correct': 45.1%; 'rather correct': 29.8%) agreed that the 'Owl's Eye' helped them to better structure the swimming skill analysis. Most respondents also stated that using the procedure saved them work in preparing the swimming skill analysis ('correct': 46.4%; 'rather correct': 26.8%). Regarding their own perceived competence, 72.7% of respondents ('correct': 36.6%; 'rather correct': 36.6%) said that using the 'Owl's Eye' made them feel more confident in analysing their learners' swimming skills. Overall, the surveyed teachers believe that the 'Owl's Eye' procedure improves the collection of data and, consequently, the analysis of swimming skills. However, the study also revealed that teachers clearly preferred a digital version of the 'Owl's Eye', as this would minimise the use of paper-based materials and provide a more comprehensive and accessible overview.

The transformation of the 'Owl's Eye' procedure into an app represents an innovation for physical education in school. Although a wide range of apps and browser-based tools has meanwhile been developed to support teachers and learners in physical education, these tools typically serve other purposes. Many apps are designed to divide teams, document scores, measure time, or quantitatively record physical performance (e.g., *SportZens*). In addition, there are numerous apps that provide games and exercises for physical education and use artificial intelligence to suggest lesson plans; however, these suggestions are usually not linked to the actual skill level of the class (e.g., *LessonPrep*).

Furthermore, some apps present ideal-typical movement patterns of various sports skills and include slow-motion and freeze-frame functions to support learners' self-directed learning phases. The app '*AssesslinkPE*' is designed for physical education skill testing and uses a 3D motion capture sensor to instantly compare a performed movement with biomechanically optimal execution. However, the app currently includes only nine skills (e.g., volleyball forearm pass, tennis forehand, vertical jump and landing, overhand throw) and is therefore of limited applicability. Moreover, it is not clear from the information provided on the associated website to what extent the app allows for functional deviations from ideal-typical movement patterns. The '*Video Delay*' app records the learners' movements and then plays them back multiple times with a delay that can be set as desired. This enables learners to observe their own movements and identify any errors. Teachers can also use the video recording to discuss the execution of the movement with the learner immediately afterwards. As the video is not saved, the school's data protection requirements are met.

Outside the domain of physical education, a range of predominantly digital diagnostic tools has been developed in recent years to support teachers in identifying

learning progress and individual support needs. For example, the 'Ernst Klett Verlag', a German educational publishing house, offers test booklets for reading and writing across different age groups. Based on the test results, teachers can plan appropriate support measures.

The digital transformation of the positively evaluated 'Owl's Eye' procedure builds on this approach for swimming education. Test results are recorded digitally, and the analysis can be displayed for individual learners, subgroups, or the entire class. Based on these results, content for subsequent swimming lessons is derived immediately and in a targeted manner.

2 The challenge of analysing motor/swimming skills

In the context of educational diagnostics, analysis refers to a predominantly qualitative approach in which the information collected is examined in detail in order to identify underlying structures, connections or causes and to derive consequences for teaching or the individual support of the learners (Schilling & Leiss, 2022). Therefore, teachers' competencies should include the ability to use appropriate strategies and methods for gathering and processing information regarding to learners' current (motor) skills, as well as the ability to analyse and correctly interpret the resulting data (Nitko, 2004). A model of diagnostic quality by van Ophuysen and Behrmann (2015) divides the diagnostic procedure into two process components (information gathering and information processing) and two outcome components (data and judgment). In this model, not only the final judgment, but also the diagnostic process, is considered to indicate the diagnostics' quality. However, research has shown that teachers often lack diagnostic competence in teaching and learning in general, as well as in physical education specifically (Brühwiler, 2017; Lounsbery & Coker, 2008; Niederkofler et al., 2018; Seyda & Langer, 2020; Ward et al., 2021; Wilson et al., 2020). Consequently, they often do not succeed when analysing their learners' (motor) skills. Some studies suggest that much information is gathered incidentally and not systematically documented, which can compromise the quality of data for later decision-making purposes (Edelenbos & Kubanek-German, 2004). These observations find equal application in the context of swimming lessons.

A study of Fokken et al. (2023, see Appendix 1) has shown that teachers' approaches to accurately analyse learners' swimming skills seem not to be optimal in most cases. The procedures used are almost exclusively informal or semiformal, with the resulting analysis mostly based on the teachers' subjective impressions. In school pedagogy, diagnostic approaches are classified as informal, semi-formal and formal (Heck & Scheuer, 2019). Informal diagnostics are characterised as unsystematic and subjective (e.g., spontaneous observations), while semiformal diagnostics are structured but lack standardisation. Formal diagnostics follow test-theoretical, standardised procedures. Formal methods serve to complement or validate less formal

approaches (Behrmann & Kaiser, 2017). Therefore, it has been pointed out for some time that teachers should use semi-formal and formal diagnostic procedures more frequently in order to reduce assessment bias (Behrmann & Kaiser, 2017; Seyda & Langer, 2020). At the same time, the use of motor skill tests as a formal diagnostic method in physical education is the subject of controversial discussions (Funke-Wienecke, 2007; Gerlach et al., 2014; Schweihofen, 2013).

In the study mentioned above of Fokken et al. (2023), only 4.9% of the participants stated that they use motor skill tests to analyse their learners' swimming skills (Fokken et al., 2023), although more than half of the teachers (60.6%) believe motor skill tests to be helpful in analysing motor skills in physical education. However, 40.1% of teachers consider motor skill tests difficult to carry out from an organisational point of view. This concern is not unfounded. For instance, the manual of the MOBAK test, which assesses basic motor skills, specifies that a test administrator should allow approximately 35 minutes to conduct the test with three to four children. Physical education teachers conducting the test with a whole class are advised to spread the tasks over several lessons (Herrmann & Seelig, 2020). Although the analysis of learners' motor skills is the first step toward targeted instructional strategies, it can be assumed that there are many limitations to the field application of evidence-based motor skill tests in school settings (Barnett et al., 2020; Hulteen et al., 2020) and that they are often not suitable for school use. Well-documented barriers using formal assessment tools include limited time, an overcrowded curriculum, and teachers' lack of competence, expertise or training (Griffiths et al., 2018; Klingberg et al., 2018; Lander et al., 2017; Lander et al., 2015). In order to support teachers in their diagnostic work, the barriers mentioned above must be taken into account when developing new tools, and teachers' needs must be incorporated into the development process.

3 Digital support for analysing learners' swimming skills

To date, there is no established digital tool specifically designed for the analysis of swimming skills in an educational setting. The development of such a tool is therefore a first attempt to address this issue. Sousa-Sá et al. (2023) state, that digital solutions for assessing motor competence could help to overcome existing barriers to motor competence assessment and might facilitate its integration into teaching practice. The transformation of the 'Owl's Eye' into a digital application therefore aims to increase accessibility and usability, encouraging wider use among teachers. This work is supported by the BMFTR through a three-year VIP+ project (July 2023 – June 2026), in which the digital transformation proceeds multiple iterative steps accompanied by regular validation. The present study represents an early element of the validation process and was guided by the following main research question:

How do teachers evaluate the usability of the low-fidelity click dummy of the 'Owl's Eye' app, used to simulate digital support in analysing learners' swimming skills, and what added value do they perceive in using the app for their diagnostic work?

4 Materials and methods of the Click Dummy Study

4.1 Study design

A low-fidelity prototype of the 'Owl's Eye' application in the form of an interactive click dummy was developed to visualise the design and navigation structure of the app. The 'Owl's Eye' app is designed to provide digital support for the structured observation and analysis of swimming skills in school settings. It allows teachers to create and manage class lists and maintain attendance records for their swimming groups. The core function of the app is to guide teachers step by step through the diagnostic procedure known as the 'Owl's Eye'. Results can be documented directly within the app. The app then automatically classifies learners according to their skill level based on these entries. It also generates recommendations for suitable games and practice activities derived from the diagnostic outcomes.

The click dummy was created using *Figma*, a collaborative interface design tool that enables app designers to create, share, and iterate user interface designs in real time. It simulated essential user interactions, enabling participants to navigate through the prototype, but did not include any functional back-end processes. In this version, users could click through the app's screens and experience the intended flow and interface design, but no real data processing or system functions were implemented. This approach enabled early usability testing and the collection of feedback regarding layout clarity, intuitive navigation, and task flow before technical implementation.

The study followed a qualitative exploratory design to investigate participants' experiences. Using the think-aloud method (Cooke, 2010), participants were asked to verbalise their thoughts while completing predefined tasks within the prototype. The think-aloud method was chosen because it provides direct, real-time insights into teachers' cognitive processes while interacting with the click dummy of the 'Owl's Eye' app prototype. By verbalising their thoughts while navigating, participants reveal how they understand the interface, make decisions, and solve problems, enabling researchers to immediately identify potential sources of confusion or error. This real-time data is particularly valuable for identifying usability issues that might remain undetected in retro perspective interviews. Moreover, the method captures context-specific feedback, as participants interact with the prototype as it would be used in practice.

4.2 Participants

The click dummy's user interface was evaluated by 11 PE teachers, including five pre-service and six in-service teachers (63.6% female, 36.4% male; *M* = 33.3 years, *SD* = 11.14). All participants (P1-P11) were part of the 'Owl's Eye' project network and therefore already familiar with the former paper-based version of the procedure. Their general teaching experience ranged from 2 months to 28 years, with their experience in teaching swimming lessons distributed similarly. Most participants were employed at primary schools, while some taught at secondary school types, including comprehensive schools and grammar schools. All participants provided written informed consent before taking part in the study, in accordance with the ethical standards set out in the Declaration of Helsinki and with approval from the researchers' university Ethics Committee (approval number 173/2021).

The required sample size for usability testing depends on the number of test cycles needed to adequately optimise a prototype and on the number of participants per cycle required to achieve data saturation. Previous studies have shown that meaningful improvements to a prototype can usually be achieved within two to three test cycles, with data saturation often already reached with five to seven participants per cycle (Molich, 2010). Since the present study only tested the click dummy and further validation studies are planned for subsequent prototype versions, a single test round with 11 participants was conducted and considered sufficient to gain initial insights.

4.3 Data collection

Data were collected through individual think-aloud sessions, a qualitative method commonly used in usability studies (Cooke, 2010; Fan et al., 2020). All sessions were conducted online in March 2025 and lasted 18:55min ± 4:15min. The 11 sessions were facilitated by two researchers, ensuring consistency in instructions and procedures across participants. At the beginning of each session, participants were presented with a brief user story to illustrate a real-life swimming lesson scenario. Then they interacted with the click dummy, including entering information about learners' attendance and swimming skill levels; however, all entries and the corresponding analysis results were pre-set.

A small selection of screenshots from the click dummy can be seen in Fig.1[5]. The first screenshot[6] displays the start screen, from which the personal login process is carried out using a password. The second screenshot shows the attendance list, where learners' attendance for swimming lessons can be documented by simple

5 The app will initially only be available in German. An English version is planned for the medium term.

6 Screenshots are numbered consecutively from left to right across rows.

clicking. Using the 'attention' icon, teacher receive a direct indication that there is specific information to be considered for '*Anna B.* ', such as details regarding a medical condition or disability. The third screenshot presents the selection options related to the app's core functions. Teachers can choose whether they wish to view the current learning status of their class or conduct the analysis. The fourth screenshot illustrates, using again the example of '*Anna B.*', the five core tasks that must be successfully completed as part of the 'Owl's Eye' procedure. Teachers can record task completion or non-completion with a single click. The fifth screen provides teachers with an overview, following completion of the 'Owl's Eye', showing how many learners have been assigned to each phase of learn to swim. This is easily identifiable through colour coding. The sixth screenshot shows an excerpt from the implementation of the combined task test with two learners from the class.

Participants were encouraged to express their thoughts, comments, and questions as comprehensively and unfiltered as possible while using the app. The test administrator did not interact with the participants, except to answer questions about the process or any technical issues. Participants' comments were captured via Webex (version 44.9.1.30809, Cisco Systems) and transcribed verbatim, providing a detailed record for descriptive analysis.

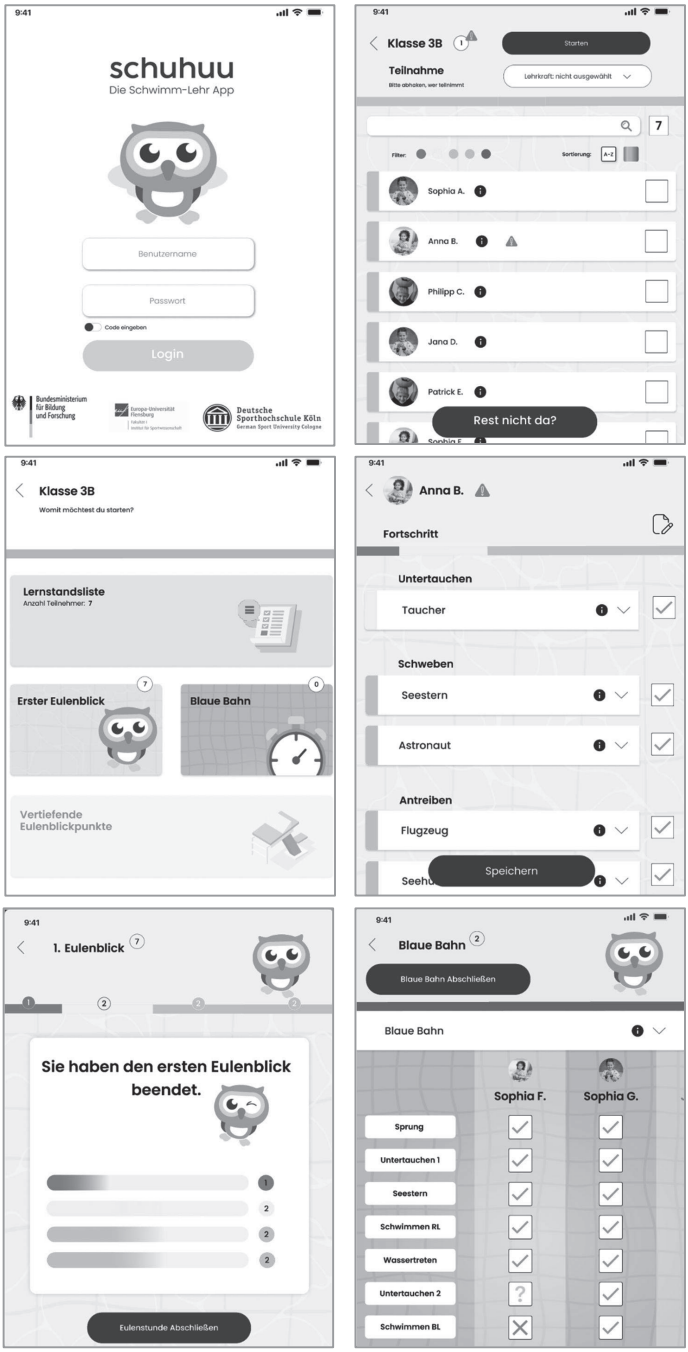

Figure 1: Screenshots Click Dummy

4.4 Data analysis

The think-aloud data were analysed inductively following the principles of qualitative content analysis according to Kuckartz (2018) to gain a deeper understanding of teachers' perceptions of the 'Owl's Eye' app prototype and its' potential for use in school swimming lessons. The analysis was conducted using MAXQDA software, which supported the systematic coding and organisation of the data. As the study did not rely on structured interview questions, the analysis followed an iterative and exploratory process. This approach resulted in personalised statements, with participants focusing on different aspects of the app.

Two independent researchers conducted the coding process, collaboratively developing the category system. Ultimately, the participants' statements were subsumed under four overarching categories that captured the main aspects of their evaluation (see Table 1):

- the app's orientation and structure (a),
- layout and colour schemes (b),
- functionality of the app in terms of conducting the analysis (c),
- typography and editorial text (d).

Individual statements that could not be assigned to a category but still seem worth mentioning have been compiled under (e) 'other insights'.

5 User feedback: Findings from the Click Dummy Study

For presentation, the findings were organised in a table following the structure of Sousa-Sá et al. (2024), who investigated teachers' perceptions of a digital app for assessing motor competence assessment. The table contains the categories mentioned above, which are structured under the headings 'Summary of Feedback', 'Teacher Quotes' and 'Changes to be taken'. The findings of the inductive content analysis are summarised under the heading 'Summary of Feedback'. Within the section 'Teacher Quotes' some examples of direct quotes from the teachers (P1-P11) can be found. Under the heading 'Changes to be taken', suggestions for changes and possible additions have been derived from the findings of the 'think-aloud' sessions.

Table 1: Click Dummy Testing Findings

(Inductive) Categories	*Summary of Feedback*	*Teacher Quotes (P1-P11)*	*Changes to be taken*
(a) Orientation & Structure	– Easy registration via login button – App is clearly laid out – Overall nice and simple – Confusing orientation at the beginning – App is reduced to the essentials – Good overview – Professional impression – Lots of nice features (videos, pictures)	*'So, I find it clear at first glance.' (P3)* *'When I first opened the app, I wasn't quite sure where to start.' (P7)* *'You have to familiarise yourself with it a little first...' (P2)* *'Now I have to find my way around a bit.' (P4)*	– Insert a short tutorial explaining how to navigate the site. – Insert orientation aids, e.g., icons/ buttons.
(b)Layout & Colour Schemes	– Very subtle colours – Beautiful colour scheme – More colour would be nice – A slightly more neutral background would be better – Appealing owl emoji/symbol, very cute – Pleasantly surprised	*'I also really like the colour scheme here, because it's subtle but fits the theme.' (P5)* *'However, I think a few more colours could be added.' (P7)* *'The use of colour is very helpful in all areas for identifying which child is at which learning level.' (P11)*	– Conduct further surveys to verify trends in both directions and adjust the colour scheme accordingly if necessary.
(c) Functionality of the app (in terms of conducting the analysis)	– Automatic sorting of children according to analysis is helpful – Colour coding shows who is at what stage and what still needs to be checked – Attendance is easy to record – Analysis with guidance useful – Problems with the order due to lack of overview – Confusion because two tasks are listed one below the other	*'Okay, now everyone will be processed in order. I think that's actually quite good.' (P7)* *'It's cool that I can see right away which group the children are assigned to.' (P5)* *'Okay, that's easy, I can see all the children right away and just go through them all.' (P8)* *'It's good that it's arranged like this. So, it's very easy to tick everything off.' (P9)* *'That means the child hasn't done it yet and it's not ticked off here that they've done it. But I can still*	– Insert an overview or explanatory video at the beginning explaining how to use the app.

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(Inductive) Categories	*Summary of Feedback*	*Teacher Quotes (P1-P11)*	*Changes to be taken*
	– Clear and systematic because you can proceed according to the criteria – Separate areas for the different parts of the diagnosis	*see the things that are missing. Now I'm confused.' (P1)* *'What I like is that when you click on the individual exercises, you get an evaluation straight away.' (P4)*	
(d) Typography & Editorial Text	– Meaning of check marks and crosses unclear – Meaning of icons not always clear – Videos and photos very helpful in confirming how things should look like – Support provided by illustrations – Change in position of the ‹Save' button unfortunate – Sometimes not clear that you have to scroll to see more tasks or children	*'What are the crosses for?' (P9)* *'Apparently, this is where the diver's instructions are stored. That's a cool idea.' (P6)* *'Yes, I think it's really good that it's shown again so that you can quickly get an overview.' (P9)* *'I'm not quite sure what the exclamation mark is for.' (P3)* *'Because, well, I have to say that I have a question mark myself when it comes to the question mark.' (P8)* *'I'm missing the legend.' (P4)*	– Add of a help section. This should include the meaning of symbols and icons.
(e) Other Insides	– Desire to be able to make notes/comments about the children – Concerns that using iPads in the swimming pool is not practical – Question about how the app works without an internet connection – Desire for several teachers to be able to access the app	*'It would be cool if teachers could add their own comments.' (P8)* *'But as I said, I don't think running around the edge of the pool with an iPad is very practical.' (P9)* *'So, without Wi-Fi... How does it work?' (P1)* *'I'm a big fan of the idea of digitising the Owl's Eye.' (P3)*	– Checking the technical opportunities to add a comment function – Consideration of potential network issues during the development process

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The following summary provides an overview of the key outcomes from the think-aloud sessions. It highlights the central feedback that derived from participants' comments on the click dummy, as detailed in Table 1.

When they opened the app for the first time, most participants commented positively on its appearance (P3, P5-P11). They described the design as appealing (P1, P5, P11) and clear (P1, P3, P5-11). After a brief orientation on the start screen, the teachers proceeded in different ways when interacting with the click dummy: Some looked at the different areas of the app first (P1, P3, P6, P7, P11), while others immediately started making entries in the attendance list, for example (P2, P4, P5, P8-P10). This resulted in some initial comments about minor orientation issues within the app (P2, P4). Some participants mentioned the colour scheme positively (P3, P7, P11), particularly the automatic assignment of children based on the key tasks of the 'Owl's Eye'. At the same time, there were mixed comments about the use of colours, with one wanting more (P7) and another wanting less (P10). The automated assignment of children after completion of the 'Owl's Eye', which forms the core of the app, was widely regarded as a valuable feature (P2, P4-P9, P11). The guided analysis was rated as useful by several participants (P1, P3, P8, P10, P11). However, some participants found it difficult to understand the order of operations (P4, P6, P7, P9). Participants also expressed a need for guidance on menu navigation and the system, for example in the form of an introductory video, particularly for those with little experience of the procedure (P6-P8). The option to review individual test tasks in text or video form was highlighted as a positive feature (P1, P3, P5-P7, P10). There was widespread confusion regarding the symbols and icons used, and there was a general call for a 'legend' (P1, P3, P4-P6, P8, P9, P11). Furthermore, it was mentioned several times that participants lacked the option of adding individual notes to learners' profiles (P8, P11). Additionally, there were concerns about the use of online devices in swimming lessons, as it might be difficult to establish an internet connection and ensure that the devices did not get wet (P1, P4, P9).

6 Discussion

The present study aimed to explore how teachers evaluate the usability of the 'Owl's Eye' low-fidelity prototype, and the added value they perceive in using this digital tool to support diagnostic work during swimming lessons. The findings offer valuable insights into the acceptance of the prototype in terms of usability, as well as its perceived contribution to teachers' diagnostic work. This is particularly relevant in light of recent work on pedagogical diagnostics in swimming, as well as the need for applicable procedures to be used in schools (Fokken et al., 2023). In addition, digital technologies are becoming an increasingly important part of teachers' daily work (Sousa-Sá et al., 2024). It is therefore important to provide them with diagnostic tools also in the form of digital solutions.

Overall, the teachers' positive evaluation of the clarity, structure and visual design of the app prototype indicates a high level of perceived usability. This findings align with research suggesting that intuitive layouts and clear workflow, along with the replacement of paperwork through app-based solutions, are crucial prerequisites for the successful adoption of digital tools in educational contexts (Sousa-Sá et al., 2024).

At the same time, usability issues identified in the think-aloud protocols, such as occasional confusion about the order of operations and unclear symbolism, indicate that high overall acceptance does not preclude the need for further optimisation. In line with previous research on assessment tools in physical education, even minor usability barriers may hinder sustained use in time-constrained settings (Barnett et al., 2020; Griffiths et al., 2018). Accordingly, teachers' feedback highlights the need for additional scaffolding elements (e.g., tutorials or legends) to support work routines, even though the 'Owl's Eye' prototype has already received a positive usability evaluation that underscores its practical benefits.

The findings gain particular relevance when situated within the broader research context of diagnostic competence in physical education, beyond usability. Numerous studies have demonstrated, that PE teachers often struggle to analyse learners' motor skills in a structured and valid manner (Seyda & Langer, 2020; Ward et al., 2021; Wilson et al., 2020). While an accurate analysis of the learners' current skills is recognised as a prerequisite for adaptive teaching, teachers rarely use standardised motor tests because they are perceived as impractical in a school context (Fokken et al., 2023). At the same time, teachers' perspectives differ regarding how the results of motor tests should be interpreted and used (Gerlach et al., 2014; Schweihofen, 2013).

Against this backdrop, the positive evaluation of the 'Owl's Eye' app' structured diagnostic workflow by teachers is particularly significant. The automatic classification of learners and clear allocation to the five phases of learn-to-swim were seen as main advantages and help teachers gain understanding of their learners' current swimming skills (Fokken et al., unpublished findings currently under review, see Appendix 2). This finding addresses the lack of practicable diagnostic tools that link the skill analysis with instructional decision-making in physical education (Knudson, 2013).

Although there are many apps that support PE teachers by providing exercises, games or documentation features (e.g., *SportZens, LessonPrep*), these tools rarely connect instructional suggestions to the analysis of the learners' skills. Similarly, video-based applications, such as '*Video Delay*', primarily enhance visual feedback, leaving the interpretation of learners' performance largely on teachers' subjective judgement and professional experience (Vogt & Staub, 2020). In contrast, the 'Owl's Eye' provides a structured framework that guides teachers through a stan-

dardised diagnostic procedure based on defined observation criteria and core tasks. In thus functions as a digital decision-support system that links diagnostic results directly to teaching practice, extending well beyond the purpose of mere video feedback. From a research perspective, this represents a significant development, as the app not only supports the analysis of swimming skills but also facilitates the translation of diagnostic information into pedagogical action. Although this linkage had already been theoretically established through the didactic framework for comprehensive swimming education (Staub & Fokken, 2020), it previously relied on teachers to actively perform this translation themselves by drawing on the framework. The 'Owl's Eye' app now supports and partially automates this process in everyday teaching practice and teachers' appreciation of this feature suggests that the app could help to reduce uncertainty in instructional planning.

The findings also suggest potential long-term implications for teachers' diagnostic competence. Teachers indicated that the guided structure and automated process of the 'Owl's Eye' app could encourage the continued use. This is particularly relevant, as repeated engagement with the app can be assumed to enhance teachers' ability to link observed swimming skills with learning phases and instructional goals. While the present study cannot empirically confirm competence development, the perceived support suggests that the app may function as a learning tool for teachers, gradually strengthening their diagnostic competence through repeated use.

7 Limitations

While the findings of the present study provide valuable insights into the usability and potential benefits of the digital 'Owl's Eye' prototype, several limitations must be considered.

First, the study was based on a low-fidelity app prototype (click dummy) that did not yet include interactive data processing, automated feedback, or real-time instructional recommendations. Consequently, the findings have limited ecological validity because teachers' evaluations were based on anticipated rather than fully enacted use. Therefore, future research should investigate the performance of a fully functional version of the app in authentic swimming lessons, examining its effects on diagnostic accuracy, instructional decision-making and teaching quality.

Second, the sample size was relatively small (N = 11) and consisted exclusively of teachers who were already familiar with the paper-based version of the 'Owl's Eye'. This familiarity may have positively influenced their perceptions of usability and usefulness. Further studies should include a broader and more heterogeneous sample, including teachers without prior experience with the 'Owl's Eye'.

Thirdly, although 'think-aloud' protocols proved effective in gaining detailed insights into usability issues and perceived added value, they cannot fully capture

teachers' behavior and challenges in actual lesson situations. Consequently, some of the practical constraints of swimming lessons may be underrepresented. Complementary methods, such as classroom observations, would enable a more thorough evaluation of how the app is actually used.

Finally, external factors such as varying access to online devices or infrastructure (e.g., internet access in indoor pools) were not experimentally controlled but could significantly influence real-world implementation.

8 Conclusion

Overall, the findings of this study indicate that digitally transforming the 'Owl's Eye' procedure represents a promising way to support diagnostic practices in school swimming lessons. From the perspective of educational diagnostics, effective diagnostic processes require teachers to systematically gather and process information about learners' current skills in order to derive appropriate (swimming) lessons (Nitko, 2004; van Ophuysen & Behrmann, 2015). Against the background of research showing that teachers often experience difficulties with diagnostic competence in teaching in general and in physical education in particular, the app-based implementation of the procedure appears to provide meaningful support in structuring these processes. Teachers perceived the low-fidelity app prototype as a usable and pedagogically meaningful tool for analysing learners' swimming skills and for translating diagnostic information into instructional guidance. When considered alongside existing research, the findings suggest that the app fills a gap in physical education by providing a structured and practical diagnostic tool that meaningful connect the analysis with instruction in swimming education. By supporting teachers in systematically collecting and interpreting learners' swimming skills data, the 'Owl's Eye' app has the potential to contribute to more adaptive, inclusive and effective swimming lessons. At the same time, the study emphasises that the long-term use of such a tool depends on resolving identified usability barriers, such as the technical infrastructure of swimming pools and situational constraints. Further research is needed to examine the effectiveness of a fully functional version in real teaching conditions. If successful, this approach could also be used as a model for diagnostic support tools in other areas of physical education and motor skill development.

References

Barnett, L. M., Stodden, D. F., Hulteen, R. M., & Sacko, R. S. (2020). Motor competence assessment. In T. Brusseau, S. Fairclough, & D. Lubans (Eds.), *The Routledge Handbook of Youth Physical Activity* (1 ed.). Routledge.

Behrmann, L., & Kaiser, J. (2017). Das Modell pädagogischer Diagnostik nach Ingenkamp und Lissmann. In A. Südkamp & A.-K. Praetorius (Eds.), *Diagnostische Kompetenz von Lehrkräften* (pp. 59-63). Waxmann.

Bissig, M., & Gröbli, C. (2004). *SchwimmWelt: Schwimmen lernen - Schwimmtechnik optimieren*. SchulVerlag.

Brühwiler, C. (2017). Diagnostische und didaktische Kompetenz als Kern adaptiver Lehrkompetenz. In A. Südkamp & A.-K. Praetorius (Eds.), *Diagnostische Kompetenz von Lehrkräften* (pp. 123-134). Waxmann.

Cooke, L. (2010). Assessing concurrent think-aloud protocol as a usability test method: A technical communication approach. *IEEE Transactions on Professional Communication*, *53*(3), 202-215. https://doi.org/10.1109/TPC.2010.2052859

Costa, M. J., Bragada, J. A., Marinho, D. A., Silva, A. J., & Barbosa, T. M. (2012). Longitudinal interventions in elite swimming: a systematic review based on energetics, biomechanics, and performance. *Journal of Strength and Conditioning Research / National Strength & Conditioning Association*, *26*(7), 2006-2016. http://www.ncbi.nlm.nih.gov/pubmed/22531620

DLRG. (2022). Schwimmfähigkeit der Bevölkerung 2022. *DLRGPresse*.

Edelenbos, P., & Kubanek-German, A. (2004). Teacher assessment: The concept of ›diagnostic competence‹. *Language Testing*, *21*(3), 259-283. https://doi.org/https://doi.org/10.1191/0265532204lt284oa

Fan, M., Shi, S., & Truong, K. N. (2020). Practices and Challenges of Using Think-Aloud Protocols in Industry: An International Survey. *Journal of Usabiity Studies*, *15*(2), 85-102.

Fokken, I., Staub, I., & Vogt, T. (2022). Lernstandsdiagnostik im Schwimmunterricht - Lerngruppen analysieren und Unterricht passgenau gestalten. *sportunterricht*, *70*.

Fokken, I., Staub, I., & Vogt, T. (2023). Physical education teachers' swimming skill analysis in 6- to 12-year-old children: Findings from an online survey. *Journal of Teaching in Physical Education*, *43*(2), 333-342. https://doi.org/https://doi.org/10.1123/jtpe.2022-0297

Funke-Wienecke, J. (2007). Bewegungsdiagnose praktisch. *sportpädagogik*, *31*(1), 4-9.

Gerlach, E., Leyener, S., & Herrmann, C. (2014). »Denn wir wissen nicht, was wir messen?«. Zur Frage der Output-Diagnostik im Sportunterricht mit Hilfe von motorischen Tests. *sportunterricht*, *63*(7), 194-200.

Griffiths, A., Toovey, R., Morgan, P. E., & Spittle, A. J. (2018). Psycometric properties of gross motor assessment tools for children: a systematic review. *BMJ Open*, *8*(10). https://doi.org/doi:10.1136/bmjopen-2018-021734

Heck, S., & Scheuer, C. (2019). Diagnostic Competence of Physical Education Teachers. In M. Peters (Ed.), *Encyclopedia of Teacher Eduation*. Springer. https://doi.org/http://dx.doi.org/10.1007/978-981-13-1179-6_339-1

Herrmann, C., & Seelig, H. (2020). *MOBAK-5-6: Motorische Basiskompetenzen in der 5. und 6. Klasse. Testmanual*

Hulteen, R. M., Barnett, L. M., True, L., Lander, N. J., del Pozo Cruz, B., & Lonsdale, C. (2020). Validity and reliability evidence for motor competence assessments in children and adolescents: A systematic review. *Journal of sports sciences*, *38*(15), 1717-1798.

Jäger, R. S. (2009). Lehrerprofessionalität - Bedingungen, Genese, Wirkungen und ihre Messung. In O. Zlathkin-Troitschanskaia, K. Beck, D. Sembill, R. Nikolaus, & R. Melder (Eds.), *Lehrerprofessionalität - Bedingungen, Genese, Wirkungen und ihre Messung* (pp. 105-116). Beltz.

Klingberg, B., Schranz, N., Barnett, L. M., Booth, V., & Ferrar, K. (2018). The feasibility of a fundamental movement skill assessment for pre-school aged children. *Journal of sports sciences*, *37*(4), 378-386. https://doi.org/https://doi.org/10.1080/02640414.2018.1504603

Knudson, D. V. (2013). *Qualitative diagnosis of human movement: Improving performance in sport and exercise*. Human Kinetics.

Kuckartz, U. (2018). *Qualitative Inhaltsanalyse. Methoden, Praxis, Computerunterstützung* (4. Aufl. ed.). Beltz.

Lander, N. J., Hanna, L., Brown, H., Telford, A., Morgan, P. J., Salmon, J., & Barnett, L. M. (2017). Physical education teachers' perspectives and experiences when teaching FMS to early adolescent girls. *Journal of Teaching in Physical Education*, *36*(1), 113-118. https://doi.org/https://doi.org/10.1123/jtpe.2015-0201

Lander, N. J., Morgan, P. J., Salmon, J., & Barnett, L. M. (2015). Teachers' perceptions of a fundamental movement skill (FMS) assessment battery in a school setting. *Measurement*

in Physical Education and Exercise Science, *20*(1), 50-62. https://doi.org/https://doi.org/10.1080/1091367X.2015.1095758

Langendorfer, S. J., & Bruya, L. D. (1995). *Aquatic readiness - developing water competence in young children*. Human Kinetics.

Leuders, T., Loibl, K., & Dörfler, T. (2020). Diagnostische Urteile von Lehrkräften erklären - Ein Rahmenmodell für kognitive Modellierungen und deren experimentelle Förderung. *Unterrichtswissenschaft*, *48*, 493-502.

Lounsbery, M., & Coker, C. (2008). Developing skill-analysis competency in physical education. *Quest*, *60*(2), 255-267. https://doi.org/https://doi.org/10.1080/00336297.2008.10483580

Mekkaoui, L., Schnitzler, C., Sidney, M., Gandrieau, J., Camporelli, F., & Potdevin, F. (2022). Building the foundation of aquatic literacy in 4–6 years-old children: A systematic review of good pedagogical practices for children and parents. *International Journal of Environmental Research and Public Health*, *19*(10), 6180.

Mekkaoui, L., Vogt, T., Camporelli, F., Costa, A. M., de Martelaer, K., Garrido, N. D., Ljodal, I., Olstad, B. H., Rejman, M., & Rudnik, D. (2025). Improving water safety and long-term engagement in aquatic physical activity: The aquatic literacy framework. *Journal of Teaching in Physical Education*.

Mertens, L., De Martelaer, K., Saakslahti, A., & D'Hondt, E. (2021). The Inter-Rater and Intra-Rater Reliability of the Actual Aquatic Skills Test (AAST) for Assessing Young Children's Motor Competence in the Water. *Int. J. Environ. Res. Public Health*, *19*(1). https://doi.org/10.3390/ijerph19010446

Molich, R. (2010). A critique of »how to specify the participant group size for usability studies: A practitioner's guide« by Macefield. *Journal of Usability Studies*, *5*(3), 124-128. https://doi.org/https://dl.acm.org/doi/abs/10.5555/2835434.2835439

Moreno Murcia, J. A., de Paula Borges, L., & Huescar Hernandez, E. (2020). Design and Validation of the Scale to Measure Aquatic Competence in Children (SMACC). *Int J Environ Res Public Health*, *17*(17). https://doi.org/10.3390/ijerph17176188

Niederkofler, B., Herrmann, C., & Amesberger, G. (2018). Diagnosekompetenz von Sportlehrkräften - Semiformelle Diagnose von motorischen Basiskompetenzen. *Zeitschrift für sportpädagogische Forschung*, *2018*(2), 72-96.

Nitko, A. J. (2004). *Educational assessment of students* (4 ed.). Pearson. https://doi.org/https://doi.org/10.25656/01:11487

Rheker, U. (2011). *Alle ins Wasser: Spiel und Spaß für Anfänger* (3. Aufl. ed., Vol. 1). Meyer & Meyer Verlag.

Schilling, L., & Leiss, D. (2022). Förderung von Diagnose- und Interventionskompetenzen mithilfe von Praxisbezügen - Konzeption eines Seminars für die erste Phase der Lehrkräfteausbildung. In T. Ehmke, S. Fischer-Schöneborn, K. Reusser, D. Leiss, T. Schmidt, & S. Weinhold (Eds.), *Innovationen in Theorie-Praxis-Netzwerken - Beiträge zur Weiterentwicklung der Lehrkräftebildung* (Vol. 1, pp. 159-183). Dominik Leiss, Torben Schmidt, Swantje Weinhold.

Schweihofen, C. (2013). Motorische Diagnostik als pädagogische Diagnostik? *sportunterricht*, *62*(3), 85-89.

Seyda, M., & Langer, A. (2020). Die Orchestrierung des diagnostischen und didaktischen Handels im Sportunterricht. Eine Frage der Kompetenz! *sportunterricht*, *69*(8), 353-357.

Sousa-Sá, E., Lander, N., Alqumsan, A. A., Alsanwy, S., Nahavandi, D., Toomey, N., Mohamed, S., Lewis, S., & Barnett, L. M. (2024). Physical Education Teachers' Perceptions of a Motor Competence Assessment Digital App. *Journal of Teaching in Physical Education*, *43*(2), 276-291. https://doi.org/10.1123/jtpe.2022-0222

Sousa-Sá, E., Lander, N. J., Alqumsam, A. A., Alsany, S., Nahavandi, D., Toomey, N., Mohamed, S., Lewis, S., & Barnett, L. M. (2023). Physical education techers' perceptions of a motor competence assessment digital app. *Journal of Teaching in Physical Education*, *43*(2), 276-291. https://doi.org/https://doi.org/10.1123/jtpe.2022-0222

Staub, I., & Fokken, I. (2020). Vermittlungsinhalte einer umfassenden schwimmerischen Grundbildung. In T. Vogt (Ed.), *Vermittlungskompetenz in Sport, Spiel und Bewegung* (pp. 129–148). Meyer & Meyer.

Sundan, J., Haga, M., & Lorås, H. (2023). Development and content validation of the swimming competence assessment scale (SCAS): A modified Delphi study. *Perceptual and motor Skills*, *130*(4), 1762-1780.

van Ophuysen, S., & Behrmann, L. (2015). Die Qualität pädagogischer Diagnostik im Lehrerberuf-Anmerkungen zum Themenheft »Diagnostische Kompetenzen von Lehrkräften und ihre Handlungsrelevanz «. *Journal for Educational Research online*, *7*(2), 82-98.

van Ophuysen, S., Lintorf, K., & Harazd, B. (2013). Zur Qualität professioneller pädagogischer Diagnostik im Schulalltag. Forschungsbefunde und -desiderate. In K. Schwippert, M. Bonsen, & N. Berkeneyer (Eds.), *Schul- und Bildungsforschung. Diskussionen, Befunde und Perspektiven. Festschrift für Wilfried Bos*. Waxmann.

Vogt, T., & Staub, I. (2020). Assessment of basic aquatic skills in children: inter-rater reliability of coaches, teachers, students and parents. *Journal of Physical Education and Sport*, *20*(2), 577-583. https://doi.org/0.7752/jpes.2020.02085

Ward, P., Shiri, A., Fatih, D., Peter, I., Insook, K., & and Li, W. (2021). Skill analysis for teachers: considerations for physical education teacher education. *Journal of Physical Education, Recreation & Dance*, *92*(2), 15-21. https://doi.org/10.1080/07303084.2020.1853635

Wilke, K., & Daniel, K. (2007). *Schwimmen: Lernen - Üben - Trainieren [Swimming: Learn - Practice - Train]* (6. ed.). Limpert.

Wilson, W. J., Brian, A., & Kelly, L. E. (2020). The effects of online motor skill assessment training on assessment competence of physical educators. *Journal of Motor Learning and Development*, *9*(1), 1-13. https://doi.org/https://doi.org/10.1123/jmld.2020-0011

Appendix 1: Summary Study 1

How do teachers analyse learners' swimming skills?

Purpose	Existing research evidence indicates that PE teachers face challenges in analysing their learners' motor skills in order to facilitate a purposeful learning process (Ward et al., 2021). Lounsbery and Coker (2008) note that the research that addressed the question of how competent PE teachers are in analysing the motor skills of their learners is disheartening. However, as there are no studies that explicitly refer to swimming lessons, this study aimed to find out how teachers analyse their learners' swimming skills.
Methodology	A quantitative online survey was conducted among 551 German primary and lower secondary school teachers (81.3% female, 45.7 ±9.6 years old). A pre-study with ten PE teachers (80.0% female, 45.7 ± 18.6 years old) was done in the form of qualitative interviews in order to generate statements for the subsequent quantitative online survey. The online questionnaire comprised nine item-batteries with a total of 73 statements to comment on using a 5-point scale. The data was collected and analysed in four categories: (1) Diagnostic information gathering in swimming lessons, (2) Teachers' experiences with diagnostics in physical education, (3) Teachers' attitude towards the use of motor tests and (4) Teachers' subjective competence evaluation.
Findings	It was found that teachers used different strategies to analyse learners' swimming skills, ranging from simple observation of movement to structured but still informal testing procedures. Almost all teachers observed their learners while playing and moving freely in the water (92.9%) or while swimming without specific instruction (85.2%). Approximately half of the study participants (50.3%) do not use set criteria in the diagnostic process. For the majority of teachers, it is particularly important to divide the learner group into swimmers and non-swimmers. A large

proportion of teachers (69.9%) reported using their own monitoring sheet or checklist to record the data collected. Only about 5% of the study participants reported using standardised motor tests to determine their learners' swimming skills. In addition, it was found that only few teachers were able to draw on knowledge from their academic studies or traineeship for their diagnostic work. 54.7% of the teachers expressed a desire for a scientifically based tool to assist them in analysing their learners' swimming skills (Fokken et al., 2023).

Appendix 2: Summary Study 2

How do teachers evaluate a diagnostic procedure for swimming skill analysis?

Purpose

The findings of Study I confirmed the authors' observations and suspicions that teachers lack a tool with which to analyse their learners' swimming skills. Existing tests do not seem to be suitable for use in (German) schools, so many teachers rely on their own designs or make unstructured observations. Therefore, the authors have developed a user-friendly diagnostic procedure for swimming skill analysis, which is called the 'Owl's Eye'. The procedure is based on the Assessment of Basic Aquatic Skills (ABAS, Vogt & Staub, 2020) and uses tasks from the ABAS task battery that have been tested for inter-rater reliability. The special quality of this procedure is that it is linked to a didactic framework for a comprehensive swimming education (Staub & Fokken, 2020). This enables teachers to use the framework to directly evaluate the results and determine the next learning objectives. The 'Owl's Eye' is structured in two steps. Initially, teachers classify their learners by conducting a few mandatory tasks to get a first insight into their learning group. The central objective of the classification is to determine whether the learners can already fully submerge and float on front and back. The initial classification is supplemented by a combined task in deep water that includes jumping into the water, submerging twice, treading water, floating on the back, and swimming on front and back for at least ten meters. In a second step, additional tasks may be administered to gain more detailed information. The two-step procedure permits the efficient analysis of the students' swimming skills, even in larger learning groups in up to 25 and more (Fokken et al., 2022). This study aims to have teachers evaluate the feasibility and subjective value of the procedure and to determine the extent to which the procedure is suitable for supporting and improving diagnostics.

Methodology

German PE teachers were asked to implement the 'Owl's Eye' into at least one of their swimming lessons at the beginning of the school year for diagnostic purposes and to evaluate it afterwards. As was the case in the first study, a pre-study involving 14 PE teachers (64.3% female, 43.2 ± 11.7 years old) was conducted in the form of qualitative interviews in order to generate statements for the subsequent quantitative survey. 58 German teachers of primary and lower secondary school (81.0% female, 45.4 ± 10.1 years old) participated in the main study and completed the online questionnaire after implementation. All participants were provided with the required information for conducting the diagnostic procedure (e. g. explanations of the two-step procedure via texts and FAQ videos, suggestions for a child-friendly implementation, documentation sheets paper-pencil). After implementation, teachers were invited to indicate which of the materials and information provided they had used for preparation and during implementation. The options for their responses were

categorised as 'yes', 'partly' or 'no'. Teachers were then asked to provide a rating for the materials on a scale of 1 to 5, with 1 indicating that the material was 'not at all helpful/useful' and 5 indicating that the material was 'very helpful/useful'. In addition, a battery of 56 statements was given, which required a response on a five-point scale. The scale ranged from 1 'not correct' to 5 'correct'. The statements were used to request the subjective evaluation regarding the feasibility and value of the Owl's Eye in general and to gain insight into teachers' personal assessment of its use.

Findings

The evaluation of the survey has demonstrated that the 'Owl's Eye' procedure is, in general, well-received. The findings to date suggest that the procedure has the potential to serve as a valuable tool for improving the accuracy and effectiveness of swimming skill analysis, and to become useful for analysing swimming skills in practice. The procedure was evaluated by the majority of teachers (89.3%) as a valuable diagnostic tool for structuring the diagnostic process. Furthermore, teachers noted that the procedure enabled them to more systematically analyse their observations and to reach more reliable conclusions. About three quarters (73.2%) of teachers agreed 'correct' or 'rather correct' with the statement, that using the Owl's Eye materials saved them work in preparing the swimming skill analysis (Fokken et al., unpublished findings currently under review). In this context, a number of respondents expressed the need for a digital record of test results to be available. The findings suggested that the Owl's Eye should be further developed and that a transformation into an app should be pursued.