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Physical Education Teachers' Evaluation of a Diagnostic Procedure for Swimming Skill Analysis in 6- to 12-Year-Old Children

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Abstract

Purpose: As accurate analysis of learners' swimming skills is essential for designing appropriate swimming lessons, a diagnostic procedure was developed and field-tested to analyze learners' current swimming skills. The procedure was developed in response to findings from a preceding study that identified challenges physical education (PE) teachers face in analyzing swimming skills. This study examines how teachers evaluate the feasibility of the procedure and the perceived value of its use.

Methodology: Fourteen qualitative interviews and a quantitative survey with 58 German PE teachers who had used the procedure in swimming lessons with 6- to 12-year-old learners were conducted.

Findings: Teachers generally evaluated the procedure positively, describing it as a valuable diagnostic tool that supports a systematic analysis of learners' swimming skills and more reliable conclusions.

Discussion/Conclusion: The findings suggest that the procedure provides meaningful support for teachers and has the potential to improve the practical applicability of swimming skill analysis.

INTRODUCTION

The realisation of individualised and appropriate teaching is based on a qualitative analysis of the learners' skills (Schrader, 2013; Williams, 1998). In physical education (PE), the main aim of a diagnostic procedure is to analyse the learners' motor skills in order to facilitate individualised learning growth and enhance performance (Knudson, 2013; Pinheiro & Simon, 1992; Reeve, 2000). Teachers must identify learners who require additional support and adapt their teaching to align with their initial level of proficiency. The gathering of information within the diagnostic process can be differentiated into formal, semiformal and informal procedures (Heck & Scheuer, 2019; Niederkofler et al., 2018). While informal and semiformal diagnostics are indispensable for everyday teaching, their susceptibility to error makes them a challenging aspect of the process. Accordingly, formal diagnostics may be employed to supplement or correct less formal information gathering (Behrmann & Kaiser, 2017; Schrader, 2013). This also applies to the analysis of the learners' skills in swimming lessons. In a recent study on PE teachers' approaches to analyse their learners' swimming skills at the beginning of swimming lessons (Fokken et al., 2023), it was found that the diagnostic procedures used are almost exclusively informal or semiformal. The majority of teachers predominantly used simple movement observation to analyse their learners' swimming skills and often did not use set criteria in the diagnostic process. Although more than half of the teachers (60.6%) believed that formal motor tests would be helpful in analysing motor skills in physical education, only few (4.9%) reported using motor tests. The study concluded that, in most cases, the quality of information gathered is not sufficient to design swimming lessons that are appropriate to learners' current skills (Fokken et al., 2023). This result is in line with previous research on the diagnostic competence of PE teachers, that shows that teachers often struggle to analyse their learners' motor skills in order to guide their learning in a targeted way (Lounsbery & Coker, 2008; Ward et al., 2021). Di Paola (2019) notes that many swimming programmes lack valid and reliable skills assessment and verification, which in turn might lead to inadequate skill acquisition and development. It can therefore be assumed that it would be helpful for PE teachers to use more formal, or at least semiformal, procedures to analyse their learners' swimming skills, rather than

relying on movement observation and on their 'gut feeling'. In order to support PE teachers in the diagnostic process, this article's research group has developed an easy-to-use diagnostic procedure for swimming skill analysis. The procedure is designed to enable teachers to easily make an initial classification during the first swimming lesson and to gain a direct insight into the learning group. In order to test whether the procedure, called the *'Owl's Eye*', is suitable for use in (school) swimming lessons, the present study investigates how teachers evaluate the feasibility of the procedure and how they subjectively perceive the value of its use.

Measuring Learners' Swimming Skills

In contrast to a great variety of assessment instruments for evaluating the level of motor competence on dry land (Hulteen et al., 2020), there are only few validated instruments for assessing the actual aquatic skills of children (Button, 2016; Chan et al., 2020; Mertens et al., 2021; Moreno Murcia et al., 2020). In a systematic review of assessment instruments for children in the aquatic environment, Wizer et al. (2021) identified twenty-one instruments for children without disabilities that include tasks related to swimming itself. Fifteen instruments were also identified as suitable for children with disabilities, as the tasks are specifically adapted to the aquatic environment. However, even existing instruments seem to be rarely or never used for diagnostic purposes, as D'Hondt et al. (2021) have identified a need for the development of validated instruments to assess children's actual and perceived aquatic skills. Furthermore, none of these instruments were cited by the German PE teachers in the study conducted by Fokken et al. (2023). In order to discuss the reasons why the available instruments may not be used, a brief description of five current instruments will be given below. The instruments use different or, on occasion, quite similar procedures to assess the swimming skills of children.

(1) Due to the lack of validated instruments to measure aquatic competence Moreno Murcia et al. (2020) designed and validated the Scale to Measure Aquatic Competence in Children (SMACC). Using the Delphi technique, the research group finally arrived at seventeen items grouped into three dimensions (socio-affective with five items, cognitive with five items and motor with seven items). The motor domain includes measures that evaluate a child's ability to use and control behaviours of movement, manipulation, turns, space-time perception, immersion, and breathing. Moreno et al. found the SMACC to be a useful instrument for measuring the aquatic competence of children aged between three and six, but noted that it wasn't suitable for use with other age groups.

(2) Chan et al. (2020) developed the Swimming Competence Questionnaire (SCQ) to provide a comprehensive assessment of children's swimming competence. The SCQ is a brief, one-page questionnaire that children complete with or without adult assistance. It consists of five items that refer to the children's swimming distance using a general swimming stroke and specific strokes (breaststroke, front crawl, backstroke, butterfly) and six items requiring respondents to report whether they can perform basic swimming skills such as holding their breath underwater, floating or treading water. The SCQ is proposed to be used as a test battery to evaluate the effectiveness of learn-to-swim programs for elementary school children.

(3) Vogt and Staub (2020) aimed at creating an easy-to-apply assessment tool to analyse basic aquatic skills in children, primarily in educational settings. The Assessment of Basic Aquatic Skills (ABAS)

comprises nineteen consecutive tasks related to submerging, breathing, floating, gliding and jumping into the water. The tasks have child-friendly names and descriptions. Each task can be scored as either passed or failed. The ABAS has been tested for inter-rater reliability by coaches, teachers, students and parents.

(4) The Actual Aquatic Skills Test (AAST; D'Hondt et al., 2021) was developed in the field of drowning prevention and for use in an educational setting to evaluate and monitor skill progress and to plan swimming lessons. It consists of seventeen different test items designed to assess young children's motor competence in the water. The items were adapted from the Pictorial Scale for Perceived Water Competence (PSPWC; De Sousa Morgado et al., 2020). Each of the seventeen aquatic skills must be rated on three possible levels of performance (from not able to able to correctly perform the aquatic skill). One task must be performed in shallow water, seven tasks in deep water and nine tasks in an intermediate depth of water. The AAST must be administered individually in order to ensure that the child understands the tasks correctly. Some of the tasks can be scored as 2 ('partly able to execute the Aquatic Skill') by using a floating device, e. g., 'leg propulsion on the back' or 'water entry by slide'. The research group presents the AAST as a promising tool to reliably assess the actual aquatic skills of young children in an indoor swimming pool.

(5) As part of a revision of the Norwegian physical education curriculum in 2017, the government introduced a compulsory swimming proficiency test to be completed before the end of the fourth grade. As existing tests were not suitable for swimming in the Norwegian context, Sundan et al. (2023) developed a valid and practical instrument for researchers and practitioners to use when measuring swimming competence in 9-to-10-year-old schoolchildren. The purpose of the instrument is to observe and score basic aquatic skills, to guide pedagogical development in learn-to-swim programs, and to be useful for further research and development purposes. The Swimming Competence Assessment Scale (SCAS) focusses on six consecutive aquatic skills (entry, front stroke, surface dive, float/rest, backstroke, exit) using a scoring system from 1 to 4 noted down on a coding sheet. Sundan et al. (2023) suggest that the SCAS is a valid and objective assessment instrument that can be used as a mandatory swimming proficiency test as well as a screening of an initial level of proficiency. Because of its comprehensiveness and continuous assessment on a four-point scale, the authors suggest the SCAS can help to identify learning difficulties and challenges and thus support children's learning and development in a school context.

Instrument's Feasibility for Use in a Pedagogical Context

With the exception of the SCQ, which relies on self-reporting, all of the instruments presented above are suitable for reliably assessing and comparing the swimming skills of learners in different age groups. While some focus more on tasks related to swimming itself, others primarily assess basic aquatic skills. Although all the instruments mentioned are primarily designed for scientific use, some authors indicate that their instrument can also be used in an educational setting. Looking more closely at the measuring instruments, there are only few references to the specific implementation. For example, in the AAST, educators use pictures to instruct the children and to carry out the assessment. For the SCAS educators use a scoring sheet to record the obtained results. The ABAS makes use of terms that are easily understandable for children as well as descriptions that are appropriate in an educational context. However, there is little information in the literature on how these instruments are used exactly, so it remains unclear how to implement them in practice. In particular, there is no information that any of these instruments have ever

been used with larger groups of children in addition to individual tests. In school swimming lessons, however, the assessment is almost always done with the whole class. Considering the number of test items (from six tasks in the SCAS to nineteen tasks in the ABAS), it can be assumed that conducting the assessment with a school class of up to thirty learners will take quite a long time. What has to be considered is the fact that swimming lessons are often very time restricted (Brettschneider, 2007; Staub et al., 2017). The assumption that the large amount of time required to conduct assessments in school practice could be problematic is consistent with the findings of a former study by Fokken et al. (2023). When asked about PE teachers' attitudes towards the use of sport motor tests, 40.1% of the participating teachers considered those tests difficult from an organisational point of view and 67.8% of the them stated that at least two teachers are needed to conduct them. They may also avoid the effort because the value of using such measuring instruments is not immediately noticeable. None of the measuring instruments provide direct guidance on how to use the test in swimming lessons or are linked to a didactic-methodological concept. However, in order to adapt teaching to the learners' level of proficiency, teachers need to gather information about their current swimming skills. Usually, teachers first want to divide the group into swimmers and non-swimmers, because this is stated in the (German) school guidelines. However, it is not enough to simply determine whether the learners can swim in order to structure the lesson appropriately. The basic aquatic skills (i.e., submerging, breathing, and floating), as the foundation of a comprehensive aquatic education (Langendorfer & Bruya, 1995; Morgado et al., 2022; Stallman et al., 2017; Staub & Fokken, 2020), should also be given special consideration in the diagnostic process. In terms of the most feasible approach, the aforementioned instruments do not seem to be entirely suitable, mainly because of the effort involved. Teachers have therefore so far had to come up with individual solutions for analysing their learners' swimming skills. These findings have led the research group to develop a diagnostic procedure for analysing swimming skills in larger groups.

A Diagnostic Procedure for Swimming Skill Analysis: The Owl's Eye

To outline a user-friendly diagnostic procedure for swimming skill analysis that takes into account the considerations mentioned above, this article's research group with different teaching and research profiles[1] has formed in 2021. The developed procedure is called the *'Owl's Eye'*, referring to the vigilant view of a wise owl. It was developed in a multi-stage process which always included theoretical considerations and a subsequent practical testing in the field.

The Owl's Eye is designed to help teachers take a focused look at the group of learners and then adapt their teaching to the learners' swimming skills. As well as a valid test procedure, there is a need for a didactic framework guiding teachers to plan their lessons. Furthermore, it must be taken into account that the procedure must also be suitable for larger groups, in order to be appropriate for school swimming lessons.

A didactic framework for a comprehensive swimming education (Staub & Fokken, 2020) served as the basis for the development of the Owl's Eye. It organises the learning process into four phases (named as red, yellow, green and blue), each with a specific objective and corresponding learning affordances (e. g. tasks that encourage you to stay submerged for longer). The Assessment of Basic Aquatic Skills (ABAS; Vogt & Staub, 2020) was chosen as the basis for the selection of the tests because the test tasks explicitly refer to

the process of learning to swim. To make the Owl's Eye as practical as possible, the tests used should be directly linked to the previously referenced didactic framework for comprehensive swimming education and classify learners into up to four subgroups (red, yellow, green and blue).

Therefore, the research group first examined the 19 test tasks of the ABAS in detail in order to assign them to the four phases of the didactic framework. Through multiple verification with learners in swimming classes, it became clear that some tasks were more informative than others when it came to grouping. Particular importance is attached to those tasks that are essential to reaching the next phase. In the end, two test tasks could be identified from the original 19 ABAS tasks to be sufficient for an initial classification of the learning group supplemented by a combined task to check the ability to learn in deep water. Given that submersion is the gateway to learning to swim, and that the human body can float on the surface of water without moving under certain conditions (Langendorfer & Bruya, 1995), testing the ability to submerge and float is fundamental.

Therefore, the initial diagnostic procedure consists of analysing the learners' ability to fully submerge (see Fig. 1) and to float in the front or back position (see Fig. 2). Those who are not yet able to submerge with their whole body and without assistance are assigned to the first phase (red) of learning to swim. Learners who can submerge but not yet float are assigned to the second phase (yellow). Learners who can both submerge and float are always placed in the third phase (green). They can now be tested to evaluate whether they can perform 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 (see Fig. 3). Learners who successfully complete the combined task are assigned to the fourth phase (blue). In a subsequent lesson a more in-depth analysis can be conducted using the other tasks of the ABAS (Fokken et al., 2022). Teachers are supported in the documentation process by pre-prepared forms. Once it is clear to which phase the learners are assigned with the help of the Owl's Eye, the didactic framework enables the teacher to select the appropriate affordances.

The present study aims to determine whether the implementation of this procedure assists teachers in conducting diagnostic analysis within a group of up to thirty learners.

MATERIALS AND METHODS

In order to investigate how teachers evaluate the feasibility of this procedure and how they subjectively perceive the value of its use, a two-step survey was conducted. This survey was designed in alignment with the methodology employed in a study on PE teachers' approaches to analysing their learners' swimming skills (Fokken et al., 2023). A preliminary qualitative study (I) was conducted to design statements for a larger-scale investigation. Subsequently, the objective of the quantitative online survey (II) was to verify and specify the findings, using the statements derived from the qualitative prestudy (I).

In preparation for both studies, all participants were given online access to a project website. This website provided an explanation of the procedure, using both written texts and FAQ videos (see Fig. 4–7). It also made available all the files that were required for conducting the diagnostics, for example, documentation forms. In addition, suggestions were given for a child-friendly implementation. Furthermore, a one-hour

online workshop was conducted, during which the procedure was explained in person and any remaining queries were addressed. The teachers were instructed to implement the Owl's Eye procedure in at least one swimming class at the commencement of the academic year for diagnostic purposes.

Data Collection & Data Analysis

Qualitative Pre-Study

Qualitative interviews were conducted with 14 German PE teachers recruited via a mailing list that was generated as part of previous research projects. The 14 teachers, from different backgrounds (see Table 1), were interviewed in groups of up to four.

The interviews were conducted using three key questions as a framework:

(1) Please indicate which of the materials and information provided you used for the implementation of the Owl's Eye and provide a rating for each.

(2) Could you please describe the methodology you employed in conducting the Owl's Eye and the sequence of steps you followed?

(3) Please provide a general and personal evaluation of the feasibility and value of the Owl's Eye.

The interviews were held online via Webex (version 44.9.1.30809, Cisco Systems) and lasted 30:12min ± 7:46min. The interviews were transcribed for the purpose of double-coding and subsequent categorical analysis. The transcripts were independently coded by two researchers using a computer-standardised coding programme (MAXQDA 2022 Analytics Pro Student). The analysis employed a combination of deductive and inductive categorisation, as recommended by Mayring (2010), with the transcripts undergoing iterative reanalysis as new categories were added. This process ensured a comprehensive and systematic approach to the data, although no further evaluation of the answers was conducted at this stage. Instead, the responses were transformed into statements, ready for implementation in the subsequent qualitative online survey.

Table 1
Sample Description of the Qualitative Interview Study and the Quantitative Online Survey

		Qualitative Interview Study	Quantitative Online Survey
		n = 14	n = 58
Gender	female	64.3%	81.0%
	male	35.7%	19.0%
	diverse	0.0%	0.0%
Age	30 years and under	14.3%	6.9%
	31 to 35 years	14.3%	15.5%
	36 to 40 years	14.3%	12.1%
	41 to 45 years	7.1%	12.1%
	46 to 50 years	21.4%	15.5%
	51 to 55 years	21.4%	20.7%
	56 to 60 years	0.0%	12.1%
	older than 60 years	7.1%	5.1%
Qualification for Teaching	Teacher training	78.6%	75.9%
	Career change	21.4%	24.1%
	Sports studies	57.1%	62.1%
Teaching experience	less than 5 years	35.7%	29.3%
	6 to 10 years	14.3%	8.6%
	11 to 15 years	21.4%	24.2%
	16 to 20 years	0.0%	8.6%
	21 to 25 years	21.4%	13.8%
	26 to 30 years	7.1%	10.3%
	more than 30 years	0.0%	5.2%
Type of school	Elementary School (grade 1 to 4)	71.4%	70.7%
	Secondary School (from 5th grade)	21.4%	25.9%
	Others (e.g., for children with disabilities)	7.2%	3.4%

Quantitative Online Survey

A total of 161 teachers registered to participate in the quantitative online survey, and the requisite materials for implementation were provided to them. Ultimately, 102 teachers provided feedback following the implementation phase. A total of 58 teachers were able to implement the Owl's Eye in their swimming lesson and complete the full questionnaire. As illustrated in Table 1, the participants represent a diverse range of backgrounds with respect to gender, age, qualifications for teaching, teaching experience, and the type of school in which they teach.

The quantitative data was collected using an online questionnaire created using Unipark (EFS survey software, Tivian 2023). The questionnaire consisted of three sections:

(1) In addition to the demographic questions asked of the 58 participants, three questions were asked at the beginning of the questionnaire regarding the materials and information provided beforehand to implement the Owl's Eye procedure. The teachers were initially asked to what extent they had utilised the provided materials and information for preparatory purposes. Their responses were categorised as either 'yes', 'partly', or 'no'. Subsequently, they were asked to indicate the extent to which they had employed the materials, such as the documentation sheet, during the implementation phase. Their responses were once again classified according to the aforementioned categories. Finally, teachers were requested 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 signifying that the material was 'very helpful/useful'.

(2) The mid-section of the questionnaire was designed to provide insights into the individual methodologies employed by the teachers in the implementation of the Owl's Eye. However, the findings of this particular section will not be presented here, as the questions were highly detailed and primarily intended to inform the ongoing development and optimisation of the procedure.

(3) The majority of the questionnaire consisted of a total of 56 statements, which required a response using a five-point scale. The scale ranged from 1 'not correct' to 5 'correct'. A total of fourteen statements were used to request the subjective evaluation of teachers regarding the feasibility and value of the Owl's Eye in general. An additional ten statements were used to gain insight into the teachers' personal evaluation of the use of the Owl's Eye. To achieve a comprehensive understanding of the use of the Owl's Eye (e.g., in relation to individual test tasks), teachers were asked to provide their feedback on 32 additional statements.

The data were analysed descriptively. Because some of the statements were quite similar, only those statements that are relevant to the interpretation of the findings are presented. Given the nature of the dataset and space constraints, this approach was deemed appropriate. Table 2a-2c present data regarding the use of the provided materials and information and illustrates the teachers' evaluation of the materials and information provided in terms of their utility and assistance in conducting the Owl's Eye. Table 3a/b outlines the teachers' evaluation of the Owl's Eye in general and the value they recognise in using it for themselves personally. Additionally, a comparative analysis was conducted regarding the evaluation of the feasibility and the value of the Owl's Eye of two distinct groups of participants: those from primary schools and other schools, as well as participants with and without full teaching qualifications. Given the absence of

notable discrepancies, the data were not subjected to further analysis. The data set and further data analyses are available by the corresponding author upon reasonable request.

FINDINGS

Findings are presented for the quantitative online survey only, which included 58 participants.

Table 2
a

Utilisation of the materials and information provided (for preparation)				
Please indicate which materials and information you utilised in your preparatory process.	**no**	**partly**	**yes**	no indication with regard to missing information
Project Website	7.02%	24.56%	**68.42%**	*1*
Video Lectures	38.18%	10.91%	50.91%	*1*
FAQ-Videos	57.41%	29.63%	12.96%	*1*
Journal Article on the “Owl’s Eye”	30.91%	29.09%	40.00%	*2*
Online Seminar	89.09%	1.82%	9.09%	*0*
Manual for the Implementation of the “Owl’s Eye”	8.93%	12.50%	**78.57%**	*0*
Diagnostic Form for Initial Classification	3.51%	7.02%	**89.47%**	*0*
Diagnostic Form for the In-Depth Analysis	29.82%	19.30%	50.88%	*0*
Illustrations of the Test Items	14.67%	7.51%	**77.82%**	*1*

Table 2
b

Utilisation of the materials and information provided (during implementation)				
Please indicate which materials and information you utilised during utilisation.	**no**	**partly**	**yes**	no indication with regard to missing information
Diagnostic Form for Initial Classification	15.52%	6.90%	**77.59%**	*0*
Diagnostic Form for the In-Depth Analysis	**40.35%**	26.32%	33.33%	*0*
Illustrations of the Test Items	27.07%	9.63%	**63.30%**	*0*

Table 2

c

Evaluation of utility and assistance of the materials and information provided						
Please evaluate the materials and information provided in terms of their utility and assistance in conducting the “Owl’s Eye” in your swimming lessons.	**1** not at all helpful/ useful	**2** rather not helpful/ useful	**3** undecided	**4** rather helpful/ useful	**5** very helpful/ useful	no indication with regard to missing information
Project Website	1.96%	3.92%	13.73%	39.22%	41.18%	*7*
Video Lectures	0.00%	0.00%	9.68%	41.94%	48.39%	*27*
FAQ-Videos	0.00%	15.79%	21.05%	10.53%	52.63%	*38*
Journal Article on the “Owl’s Eye”	3.03%	6.06%	18.18%	36.36%	36.36%	*25*
Online Seminar	0.00%	0.00%	0.00%	33.33%	66.67%	*52*
Manual for the Implementation of the “Owl’s Eye”	0.00%	1.82%	20.00%	29.09%	49.09%	*2*
Diagnostic Form for Initial Classification	0.00%	1.89%	7.55%	32.08%	**58.49%**	*4*
Diagnostic Form for the In-Depth Analysis	2.13%	6.38%	19.15%	40.43%	31.91%	*10*
Illustrations of the Test Items	1.57%	5.78%	9.42%	21.36%	**61.87%**	*9*

Table 3
a

Feasibility and Value of the “Owl’s Eye”							
Please evaluate the general feasibility and value of the “Owl’s Eye” by commenting on the following statements. In my view, the “Owl’s Eye” is…		**1** incorrect	**2** rather incorrect	**3** undecided	**4** rather correct	**5** correct	no indication with regard to missing information
General subjective evaluation	… a valuable tool for structuring the diagnostic process.	0.00%	0.00%	10.71%	39.29%	**50.00%**	*0*
	… a useful method for the differential analysis of the learners’ swimming skills.	0.00%	1.79%	25.00%	33.93%	**39.29%**	*0*
	… helpful to adequately categorise the learning group.	1.82%	12.73%	14.55%	36.36%	34.55%	*1*
	… NOT a reliable instrument for the analysis of the learners’ current swimming skills.	**64.81%**	18.52%	9.26%	3.70%	3.70%	*1*
	… a child-friendly procedure for conducting the swimming skill analysis.	0.00%	1.79%	10.71%	**42.86%**	**44.64%**	*1*
	… NOT a time-efficient procedure for conducting the swimming skill analysis.	29.09%	14.55%	20.00%	25.45%	10.91%	*1*
	… NOT suitable for swimming lessons at school.	**57.14%**	19.64%	17.86%	0.00%	5.36%	*1*
	… a reliable procedure to	0.00%	7.27%	25.45%	40.00%	27.27%	*2*

	gather diagnostic information for planning appropriate swimming lessons.						
	… helpful in identifying learners' learning progress.	0.00%	7.69%	21.15%	36.54%	34.62%	*5*
	… a COMPLICATED procedure for conducting the swimming skill analysis.	35.85%	30.19%	15.09%	9.43%	9.43%	*2*
	… a procedure that learners enjoy participating in.	1.85%	5.56%	20.37%	35.19%	37.04%	*3*
	… is beneficial for teachers who have little or no experience in teaching swimming lessons.	0.00%	4.08%	8.16%	30.61%	**57.14%**	*9*

Table 3
b

Feasibility and Value of the “Owl’s Eye”							
Please evaluate the feasibility and value of the “Owl’s Eye” for you personally by commenting on the following statements. Using the “Owl’s Eye” …		**1** incorrect	**2** rather incorrect	**3** undecided	**4** rather correct	**5** correct	no indication with regard to missing information
Personal subjective evaluation	… makes me feel competent in analysing my learners’ swimming skills.	1.82%	10.91%	14.55%	36.36%	36.36%	*3*
	… has NO value to me.	**54.39%**	**22.81%**	12.28%	5.26%	5.26%	*0*
	… helps me to better structure the swimming skill analysis.	1.75%	10.53%	12.28%	**29.82%**	**45.61%**	*1*
	… supports me to analyse my learners’ swimming skills in a differentiated way.	0.00%	7.14%	14.29%	**35.71%**	**42.86%**	*2*
	… has led me to rethink my previous diagnostic procedure.	3.64%	9.09%	18.18%	34.55%	34.55%	*3*
	… provides me with valuable guidelines for planning my swimming lessons.	0.00%	6.90%	12.07%	**32.76%**	**48.28%**	*0*
	… saves me work in preparing the swimming skill analysis.	3.57%	5.36%	17.86%	26.79%	46.43%	*1*
	… facilitates the implementation of the swimming skill analysis.	0.00%	8.93%	17.86%	32.14%	41.07%	*1*

DISCUSSION

The implementation of individualised and appropriate teaching practices is based on a qualitative analysis of learners' skills (Schrader, 2013; Williams, 1998). It is assumed that the use of a scientifically based tool to analyse learners' current skills improves diagnostic judgement. This also applies to the analysis of learners' motor skills in general, as to learning to swim. However, analysing their learners' (swimming) skills seems to be a difficult task for many PE teachers. In a preceding study (Fokken et al., 2023), the need for a tool to assist PE teachers in analysing their learners' current swimming skills was identified. In the course of this research, it was found that the majority of the existing tools were not designed for use with larger groups of learners, and there was a lack of evidence regarding their efficacy when used with such groups. As a result, a diagnostic procedure, the Owl's Eye, was developed and made available to German PE teachers. The main aim of the present study was to determine teachers' perceptions of the feasibility and subjective value of the Owl's Eye in order to draw conclusions about its potential for use in school swimming lessons.

To be most effective, skill analysis requires extensive planning and systematic steps (Knudson, 2013). Therefore, the first part of the survey was about the utilisation of the provided materials and information for preparation and during implementation. Teachers had access to a variety of materials and information sources to help them prepare. While almost all teachers made at least partial use of the project website, resources such as the video seminar or the FAQ videos were used much less frequently for preparation. Only about 10% of all participants took part in the online preparation seminar, which was offered once on a fixed date. The manual, which included several suggestions for implementation, was used by the vast majority of participants, as were the illustrations of the test items, especially for the initial classification. The use of the article, which briefly explains the entire procedure, was very mixed. It can be stated, that in preparing to use the Owl's Eye, teachers mainly used the materials they needed to implement the programme. The background information provided was used much less or only partially. One possible explanation could be that they do not have the time to study the theoretical background intensively. Another explanation would be that reviewing the prepared materials is sufficient for them to understand the procedure. As there is no evidence that the teachers did not understand what they were asked to do, it can be assumed that theoretical background knowledge is not really necessary to use the procedure. During implementation the diagnostic form was used by about 80% of the teachers for the initial classification, while the diagnostic form for the in-depth analysis was not used by about 40% of the teachers. This could be explained by a lack of time, as there is usually only a limited amount of time available for swimming lessons (Brettschneider, 2007; Staub et al., 2017). However, it is also possible that the results of the first classification were already sufficient for the teachers to adapt their lessons to the learning level of the learners. Without knowing the full reasons for why most teachers did not go on to analyse further, these findings support the two-stage approach the research group decided to follow. Although in-depth analysis provides a more detailed insight into learners' swimming skills, it can be assumed that the initial classification is initially sufficient for adequate lesson planning.

In the second part of the survey, the materials and information provided were to be evaluated by the teachers in terms of their usefulness and support. They were consistently rated positively, provided that they were used. In particular, the diagnostic form for initial classification was rated as helpful or very helpful by

almost all. Similarly, many appreciated the support provided by the illustrations of the test items. Teachers found the diagnostic form for in-depth learning status diagnostics somewhat less useful. This could be due to the effort required to conduct the in-depth analysis. The qualitative interview study had already demonstrated that it is impractical for most teachers to complete an individual diagnostic form for each learner. This was one of the factors that led the research group to conclude that the logical subsequent step would be to transform the Owl's Eye into a digital application. The responses to the FAQ videos exhibited a certain degree of divergence. This may be attributed to the fact that the study was designed to address potential queries, and it is plausible that some participants' inquiries could not be addressed by the FAQ videos. Although very few teachers took advantage of the opportunity to participate in the online preparation seminar, the feedback was consistently positive. This can be considered an argument in favour of continuing to offer the opportunity to prepare for analysis through online training.

In the third part of the survey, teachers were asked to evaluate the Owl’s Eye in general and to state the value they personally recognise in using it. Teachers tended to assign the highest possible ratings to the Owl's Eye. The majority of teachers considered the Owl's Eye to be a valuable tool for structuring the diagnostic process, and they considered the procedure to be a useful method for differential analysis of learners' swimming skills. It is noteworthy, that most teachers were convinced that the Owl's Eye is a reliable tool for analysing learners' current swimming skills, despite the fact that only a limited number of tasks are conducted during the initial classification. It appears that teachers consider the process to have a high degree of validity, despite its rather minimalist approach. In approximately three-quarters of cases, respondents indicated that the Owl's Eye provides them with valuable guidelines for planning their swimming lessons, although no specific suggestions for swimming tasks or exercises were made. The majority of teachers also stated that using the Owl's Eye materials saved them work in preparing the swimming skill analysis. Opinions differed on the time efficiency of implementing the procedure in question. It can be assumed that time efficiency improves when teachers use the tool for the second or third time and are more familiar with the processes. In more than half of the participants, the use of the Owl's Eye has led to a reconsideration of the diagnostic procedure previously employed. Given that high quality data has been shown to increase the likelihood of a 'good' judgement (Behrmann & van Ophuysen, 2017), it is encouraging that teachers find the Owl's Eye helpful and supportive.

LIMITATIONS

The studies did not examine whether the teachers conducted the Owl's Eye in accordance with the theoretical expectations. The qualitative interview study indicated that some teachers performed additional tasks beyond the necessary scope during the in-depth analysis. This resulted in their conclusion that the implementation process is excessively lengthy. Further, it must be acknowledged that a sizeable proportion of the participating teachers only undertook the initial classification, which may limit the extent to which the findings can be generalised to the Owl's Eye as a whole.

CONCLUSION

The results indicate that the Owl's Eye is beneficial for PE teachers. The positive feedback suggests that teachers will continue to use the Owl's Eye in the future. The findings to date indicate that the Owl's Eye has the potential to serve as a valuable tool for enhancing the precision and efficacy of swimming skill analysis. The findings suggest that the Owl's Eye should be further developed and that a transformation into an app should be pursued. If a larger user group were to be attained, the current positive evaluation remains to be verified. Moreover, it would be beneficial to investigate the extent to which the utilisation of the Owl's Eye affects the diagnostic competence of PE teachers, as there was broad agreement that the Owl's Eye is useful for teachers who have little or no experience in teaching swimming. It would also be a worthwhile objective to investigate the potential for the procedure to be applied to other sporting disciplines.

Declarations

FUNDING DECLARATION

This research was funded by internal research funds of the German Sport University Cologne (HIFF), Grant Agreement No. HIFF-11-10051-104.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

All participants provided informed consent prior to participation. The study was approved by the Ethics Committee of the German Sport University Cologne. The study was conducted in accordance with the Declaration of Helsinki.

CONSENT FOR PUBLICATION

Not applicable.

AVAILABILITY OF DATA AND MATERIALS

The datasets generated and analysed during the current study are available from the corresponding author on reasonable request.

Author Contribution

A., B., and C. contributed to the conceptualization and design of the study. A. performed the formal data analysis and wrote the original draft of the manuscript. B. and C. contributed through supervision and critical revision of the manuscript. All authors reviewed and approved the final manuscript.

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Footnotes

1. All members have at least a university degree in sport science, mostly including a doctoral degree. The majority is involved in PE Teacher education in the special field of swimming, some have been doing so

for more than twenty years. Some members have additionally worked as PE teachers in schools for several years.

Figures

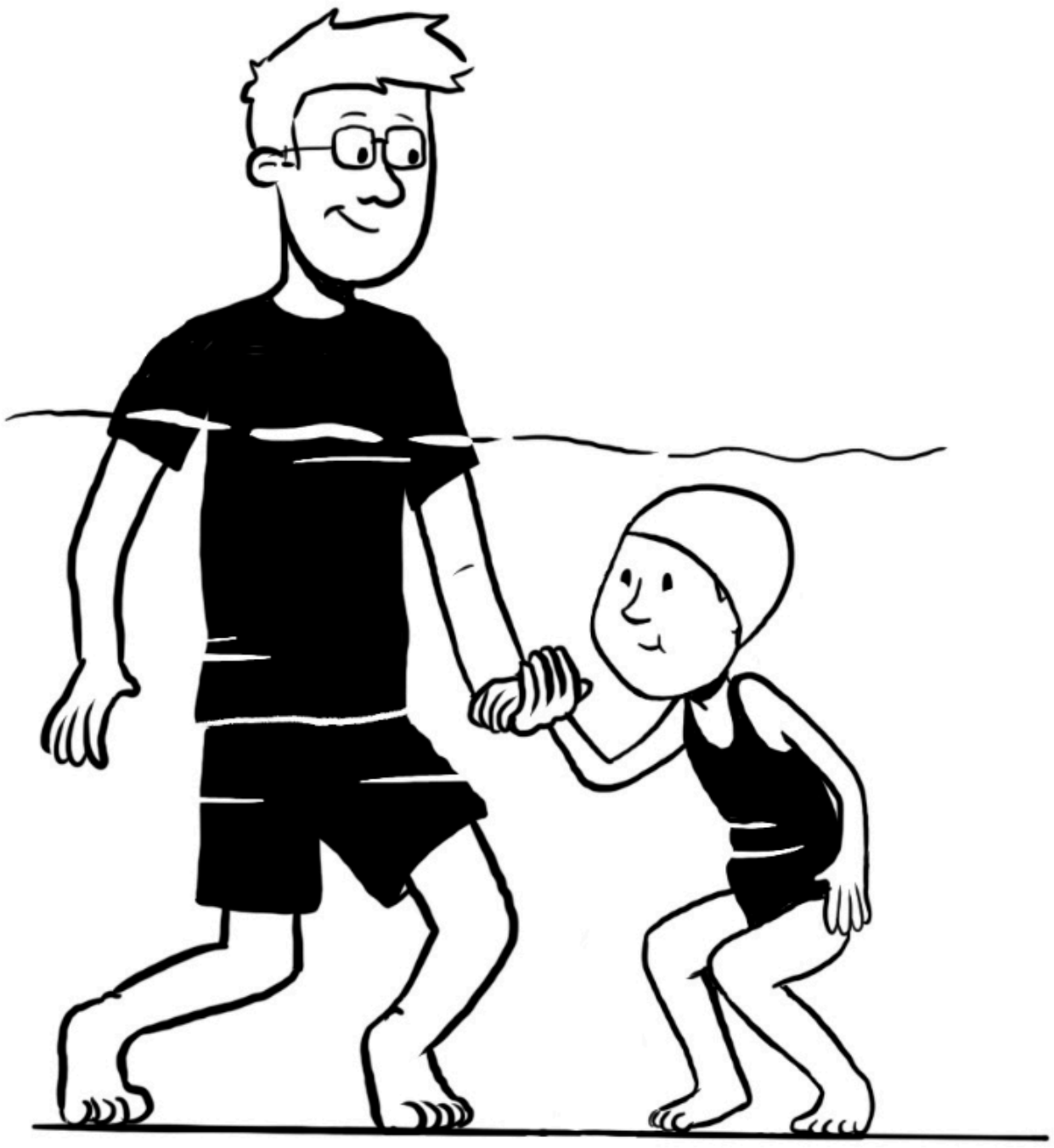


Figure 1

Performing the test task “submergence” using the teachers’ helping hand

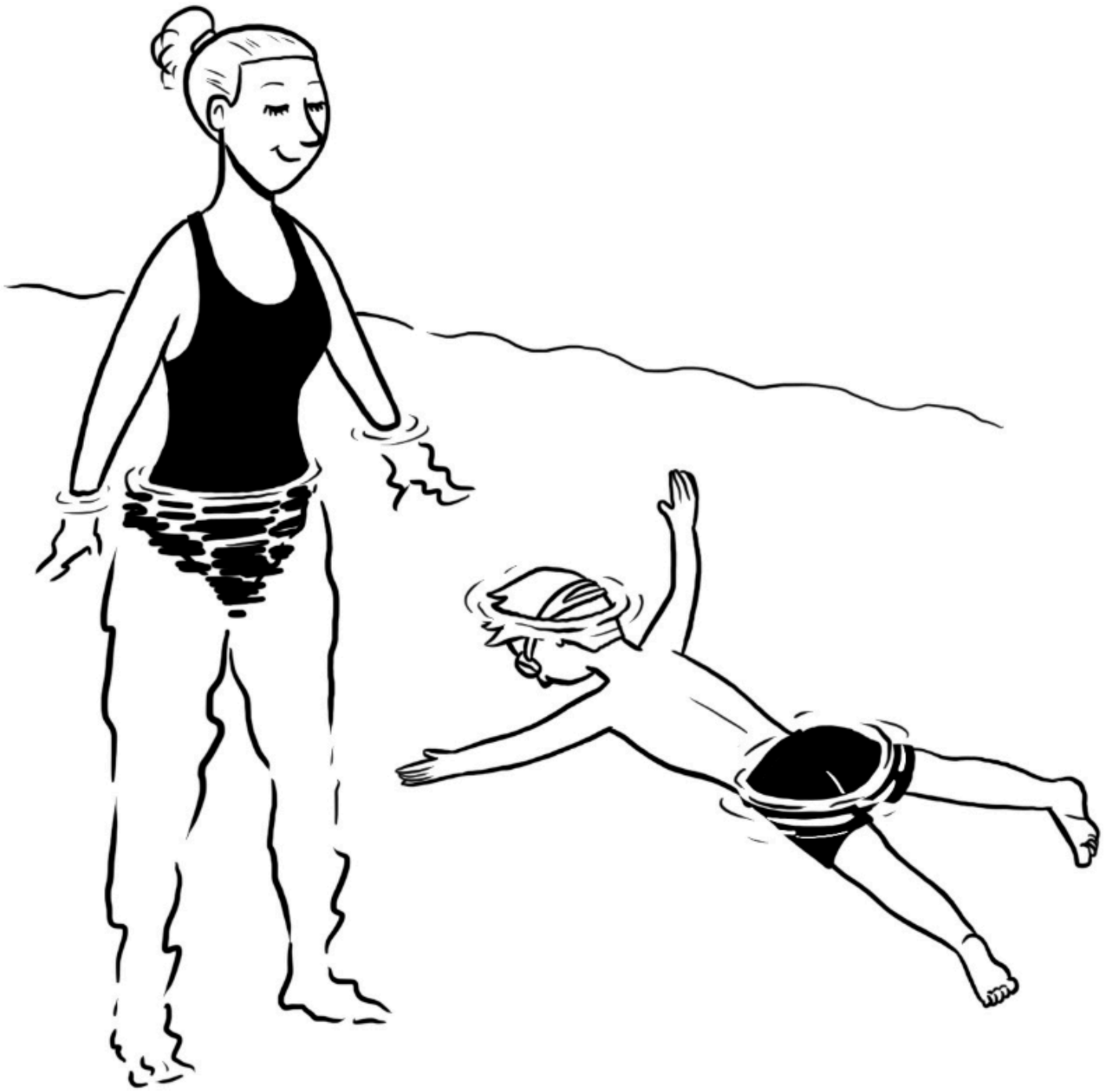


Figure 2

Performing the test task “floating in front position”

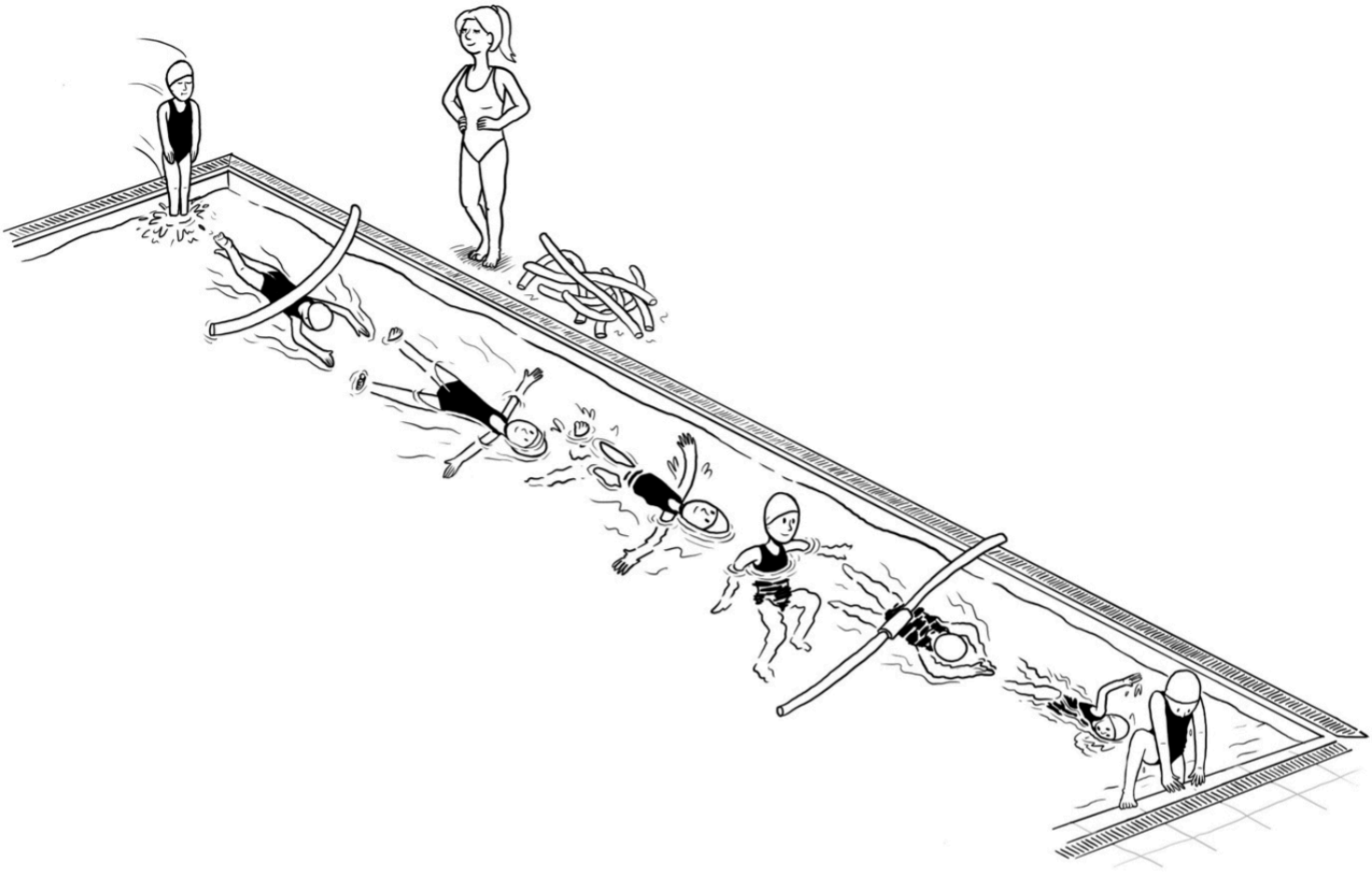


Figure 3

Performing the combined task in deep water



Figure 4

Start Screen of the Project Website

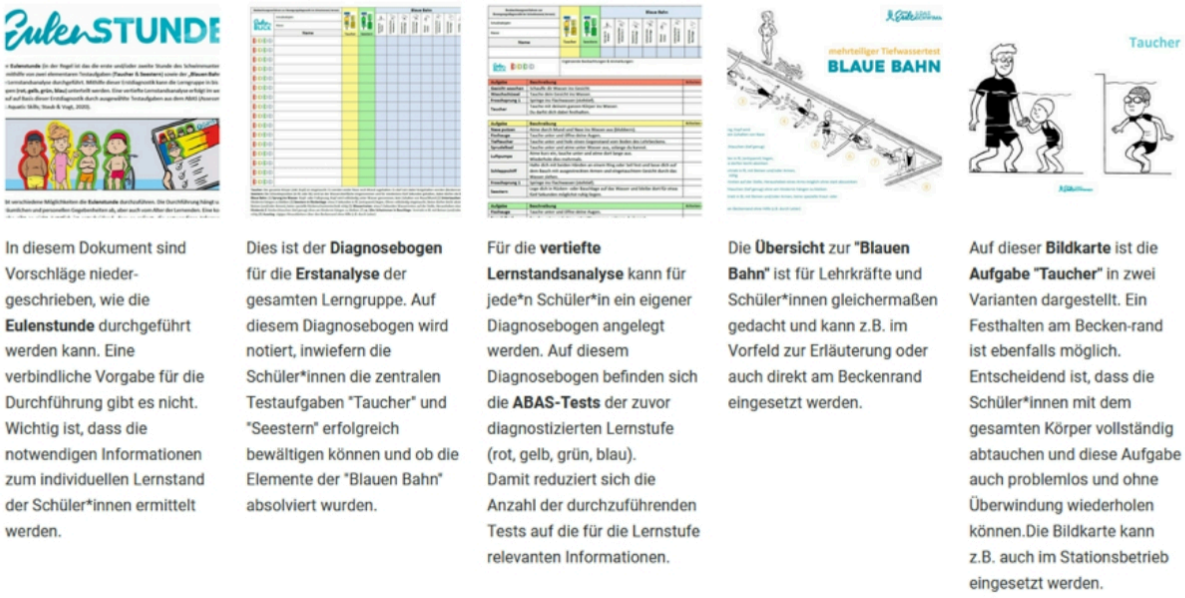


Figure 5

Overview of the materials provided (part 1)



Auf dieser **Bildkarte** ist die **Aufgabe "Seestern"** dargestellt. Der Seestern sollte in Bauchlage durchgeführt werden (auch wenn es in der Beschreibung Bauch- als auch Rückenlage zulässig ist), um zu überprüfen, ob die dazu notwendige Tauchzeit von fünf Sekunden auch durchgehalten werden kann. Die Bildkarte kann z.B. auch im Stationsbetrieb eingesetzt werden.


8 Vermittlungsinhalte einer umfassenden schwimmerischen Grundbildung

Dieser Text erläutert das **"Vermittlungsmodell der Schwimmerischen Grundbildung"** und beschreibt ausführlich die vier Lernstufen (rot, gelb, grün, blau) sowie die dazugehörigen Lernanlässe, die gestaltet werden sollten, um einen Lernfortschritt zu ermöglichen.
Der Film zum Text ist hier zu finden.


Lernstandsdiagnostik im Schwimmunterricht
Lerngruppen analysieren und Unterricht passgenau gestalten

In diesem Text wird as **Beobachtungsverfahren zur Bewegungsdiagnostik im Schwimmen(lernen)** in seinen Grundzügen beschrieben. Zum Zeitpunkt der Veröffentlichung wurde der Begriff "Eulenblick" allerdings noch nicht verwendet.



Hier findet sich die Übersicht der **19 Aufgaben** des schwimmlernspezifischen Fertigkeitstests (**ABAS**; Assessment of Basic Aquatic Skills) mit den jeweiligen Beschreibungen der Aufgabe und den Bewertungskriterien.



Die acht Elemente der "Blauen Bahn" werden in diesem Kartenset einzeln dargestellt und erläutert, so dass die Karten beispielsweise (einlaminiert) am Beckenrand ausgelegt werden können, um den Ablauf zu verdeutlichen.

Figure 6

Overview of the materials provided (part 2)



Figure 7

Overview of the FAQ-videos provided