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Differentiation in outcome-focused physical education: pedagogical rhetoric and reality

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Background: This study was grounded in the differentiated instructional model where teachers tailor content, process/support, and product in response to their students' levels of readiness and interest. The value of differentiated teaching is well established; however, the implementation of such a technique is difficult due to differences in student skills and preferences.

Purpose: In this study, we sought to explore physical education (PE) teachers' perceptions about the need for differentiation in their swimming programs (i.e. the differentiation 'rhetoric'), along with their actual use of differentiation strategies (i.e. the differentiation 'reality') in their swimming lessons.

Participants: Three Western Australian high school Year 8 and Year 9 PE teachers (two from a non-government school and one from a government school), ranging in age from 25 to 39 years and with 5 to 15 years of PE teaching experience, participated in this study. The study involved four classes, totaling 103 students.

Data collection: Teachers' perceptions about the need for differentiation, along with their actual use of differentiation strategies, were recorded using class observations (i.e. 36 lessons) and questionnaires and were supported by in-depth teacher interviews. Students from these classes were also targeted for observation and interview during a single school term.

Data analysis: Observation data were inductively analyzed according to Tomlinson's model of differentiation. All interviews were tape-recorded and transcribed verbatim, before transcripts were coded in order to identify recurring themes. Percentage yes/no scores were calculated for student questionnaire data.

Findings: While successfully differentiating content and process/support in the swimming classroom, teachers infrequently differentiated for product (e.g. different forms of assessment). Moreover, the limitations of space/numbers, time, and student readiness impacted on the differentiation strategies and student learning opportunities and outcomes.

Conclusion: Implementing a differentiated approach to swimming teaching appears to represent a significant challenge, though these data provide evidence of differentiated pedagogy that facilitated student learning outcomes.

Keywords: high school; PE; student outcomes; swimming

To be effective, teachers need to tailor their content and instruction to the specific learning readiness and interests of their students, by integrating concepts and implementing teaching strategies that are responsive to the students' diverse needs (Dill 1990; Jewett and Bain

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1985). The specific job of physical education (PE) teachers is no different in this respect, and it is imperative that PE teachers provide learning opportunities that cater for the skills and abilities of each of their students. As Graham (1995) noted, although the delivery of PE would be substantially easier if students had identical interests, abilities, and backgrounds, a 'one program fits all' approach does not encourage optimal student development. It has long been recognized that PE represents a complex learning environment, which is characterized by significant differences in (a) the developmental level of learners, (b) their stages of learning (i.e. beginner, intermediate, and advanced), and (c) the diverse nature of the tasks that need to be covered (Yerg 1983). Accordingly, it is not surprising that PE teachers have outlined how their confidence to deliver tailored programs to their students may underpin the performance, motivation, and enjoyment of the students (e.g. Chase 1998). In cases where teachers do not cater for all individuals in PE, this may create a number of problems for students, including reductions in active time in class (Silverman 1991), as well as poorer performers being overlooked (Goodwin 1997) and making little progress in PE across their school years (Kirk 1995). In summary, as Rink (2001) noted, 'there may be no best way to teach, but there may be a best way to teach particular content to particular learners' (123–124).

One of the pitfalls associated with a 'one program fits all' or 'middle of the road' approach is that PE teachers tend to attribute failings in student learning to the students themselves, rather than being accountable for their own shortcomings (Graham 1995; McCaughtry and Rovegno 2003). At a societal level, these limited approaches to PE instruction, which are not underpinned by a developmentally appropriate pedagogy, may inhibit children's opportunities to engage in meaningful and developmentally necessary movement experiences (Golder 2003). One notion that encourages the development of teaching content and practices tailored to student needs is the concept of *differentiation* (Graham 1995; Tomlinson 1995, 1999). In particular, the differentiated instructional model (Tomlinson 1999) encourages teachers to respond to the needs of all learners, with consideration being given to each student's readiness, interest, and capabilities. In practice, differentiation is achieved by teachers accommodating the varied needs and interests of their students in the development and administration of their lessons. For example, rather than providing a single task for a whole class to complete, a differentiated lesson may comprise two separate simultaneous activities, which vary in terms of task difficulty (Pellet and Harrison 1996). Alternatively, PE teachers may accommodate their students' varied skill levels via the provision of technical aids, such as flotation devices in swimming (Block and Conaster 2002).

The overarching goal of differentiation is to maximize student growth and provide opportunities for optimal development for all students (see coverage by Gower 2010; Hume 2007; Kerry 2004). In addition, differentiated instruction is proactive. That is, if different students each have unique needs and skills, delivering a tailored and varied approach for the students is essential for effective teaching and quality learning. As Tomlinson (1999) noted, 'differentiation is not so much the "stuff" as the "how"' (16). In short, the student-centered nature of differentiated teaching approaches may provide important information for the development of PE pedagogy and curriculum.

Tomlinson's (1999) model outlines a number of specific criteria by which teachers may provide differentiated content in the classroom. Specifically, this framework identifies that differentiation may incorporate a variety of instructional approaches targeted at the modification of content (i.e. what students learn), process/support (i.e. how students go about making sense of ideas and information), and product (i.e. how students demonstrate what they have learned) and also takes into account individuals' readiness and interest in

a given area. Accordingly, this study was grounded in the notion that differentiating reflects the tailoring of content, process/support, and product in response to students' levels of readiness and interest (Figure 1).

Content relates to what a student comes to know, understand, and/or be able to do as a result of a learning intervention – it is the input. In terms of differentiating for content in PE, this environment is suited to the provision of more challenging activities (i.e. compacting) to the higher ability students, which may permit additional teaching time with lower ability students (e.g. mini-lessons), along with the use of modified equipment or game rules. The second component of the model, termed *process/support*, reflects the opportunity for students to make sense of the content. The level of support provided by the teacher is crucial to the accomplishment of this goal, which may encompass the provision of guidance, feedback, and direction to students. Approaches that may be used for differentiating process include providing individual responsibilities and challenges to work in small groups during a PE lesson modeled on the non-reciprocal peer teaching format (Mosston and Ashworth 2002). For example, if a student adopts a role of a 'coach' during a lesson, he/she may be encouraged to solve problems and make decisions relative to training and conditioning, skill remediation, and strategy. As a result, students are able to undertake diverse responsibilities, which incorporate planning and support for other members of the class.

The third aspect of differentiation relates to how students demonstrate their learning (i.e. *product*). Typically, outcomes (either measured or observed) are the focal point of a teacher's lesson plan and play the primary role in determining the structure of the teaching (e.g. Rink 1996). Conversely, when differentiation is employed, the lesson is driven not

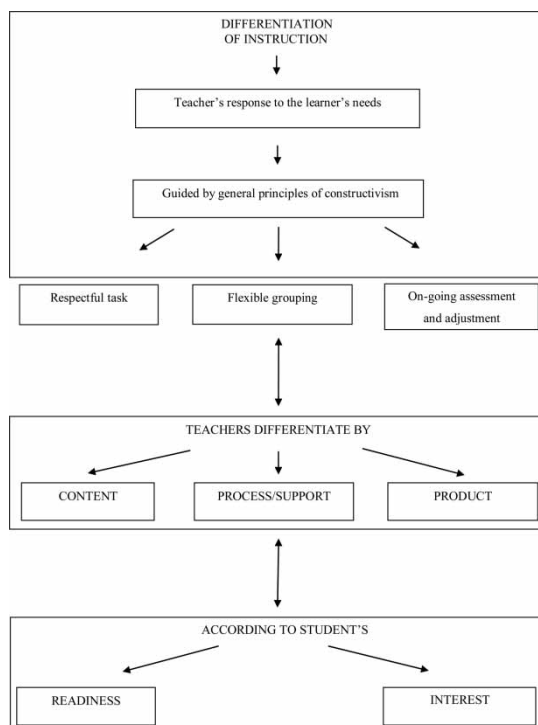


Figure 1. The differentiation model adopted in this study (modified from Tomlinson 1995, 1999).

by the product, but rather by the learning processes that will ultimately bring about the product (Graham 1995; Tomlinson 1995, 1999). According to Graham (1995) and Tomlinson (1995, 1999), teachers who differentiate according to product use ongoing diagnostic assessment and provide alternative and non-traditional opportunities for their students to display learning. A PE teacher may, for example, accommodate varying ability levels by requesting his/her students to perform their skills in a modified environment that maximizes the opportunity for the students to display learning. For instance, teachers may implement a volleyball game in which lower ability students are encouraged to catch the ball and self-feed before executing a volley. Such an approach might allow students to demonstrate newly learned game-based strategies that may otherwise be hidden by poor skill execution.

The final considerations in the model of differentiation relate to students' readiness and interest. First, activities that far exceed or fail to meet a learner's *readiness* will likely engender unfavorable behavioral and emotional responses on the part of the learner. Indeed, a failure to cater for student readiness has been shown to negatively impact upon the students' levels of concentration, achievement, motivation, and self-worth (Rikard and Woods 1993). Second, in line with the attainment of 'flow' – an experience of complete immersion and feeling at one with an activity (Csikszentmihalyi, Rathunde, and Whalen 1993) – it is important that teachers provide activities that stimulate and maximize the *interests* of their students. Accordingly, teachers are encouraged to define the purpose or goal of their activity/exercise clearly and reinforce the appropriateness of the task to the capacities of their students. New challenges and experiences that demand the application of acquired skills and knowledge are also central to meeting students' interests.

Providing a balance of complementary activities that meet student needs, readiness, and interest levels is paramount (Jewett and Bain 1985; Manross and Templeton 1997). However, while the need for a differentiated approach is well established, the implementation of such a technique is difficult due to the vast differences in student skills and preferences, as well as the diverse contexts incorporated in PE (Pellet and Harrison 1996; Rink 1996). While student-centered pedagogies present significant challenges for differentiation in activities such as swimming, where safety is a concern and student ability/interest may vary greatly (Whipp and Taggart 2003), the implementation of this empowering developmental approach is worth investigating. As outlined in the differentiation model, effective teachers are those who are able to encourage and assist their students by manipulating PE-related content, process, and product, according to student readiness and interest. In this study, we sought to explore PE teachers' perceptions about the need for incorporating differentiation in their programs (i.e. the differentiation 'rhetoric'), along with their actual use of differentiation strategies in the swimming context (i.e. the differentiation 'reality').

Methods

Participants and procedures

Table 1 presents a summary description of the participants and setting. Prior to data collection, ethical approval for the study was obtained from the human subjects' ethics committee at the lead author's institution, and informed consent was obtained from all participants. Class observations, questionnaires, and in-depth interviews were undertaken with three teachers ('Karrie', 'Annika', and 'Ernie') of Year 8/9 classes, and members of their classes were also observed and interviewed during a single school term. Swimming was the only Year 8/9 PE activity undertaken in all of the participant schools during the term. Two teachers

Table 1. Participants and setting.

Methods and instruments	Participants	Setting
Teacher and class observations	Three teachers, four classes, and three target students within each class (on a rotational basis)	The lessons that comprised the PE swimming unit: Two classes at an Independent Girls School Karrie = Yr 8 class (Beatrice, Amber, and Rumor); observed six lessons (of the total seven) Annika = Yr 9 class (Sharon, Lisa, and Kate); observed 8 lessons (of the total 11) Two classes at a co-education Government High School Ernie = Yr 8 class (Vinnie, Sarah, and Leanne); observed 12 lessons (of the total 13) Ernie = Yr 9 class (Joe, Terry, and Robert); observed 10 lessons (of the total 14)
Teacher interviews	Three teachers	Three 45-min interviews per teacher (beginning, during, and end of the unit)
Student interviews	Three target students	One post-unit 30-min focus group with all three students (as a group) One-to-one interview following each lesson with all three students

(Karrie and Annika) were recruited from the same independent (i.e. private) school (i.e. School A), and the third teacher (Ernie) was recruited from a state secondary school (i.e. School B). Both schools were located within the Perth metropolitan region. Karrie, at 39 years of age, had 19 years of experience in teaching primary and secondary PE. Karrie was observed six times while teaching a Year 8 PE swimming unit to a class of girls ($n = 21$), and in total, Karrie delivered seven PE swimming lessons of 50-min duration. Annika was 25 years of age and had 5 years of experience in teaching primary and secondary PE. Annika taught Year 9 swimming classes ($n = 24$) and was observed eight times. A total of 11 lessons were allocated to swimming in Year 9 PE during the term in which data were collected. As with Karrie's, each of Annika's lessons was 50 min in duration. The final teacher, Ernie, was 39 years old and had been teaching PE for 15 years. Ernie was observed 12 times while teaching a co-educational Year 8 class ($n = 28$). Throughout the term, he delivered 13 swimming lessons to his Year 8 class, six of which were of 50-min duration and seven were allocated 70 min. Ernie was also observed 10 times while delivering a swimming unit to a class of Year 9 males ($n = 30$). He taught 14 lessons in total to his Year 9 class, eight of which were 50 min in duration and six were allocated 70 min. Content in both Annika and Ernie's lessons was targeted at meeting guidelines within a local introductory swimming/life-saving award (i.e. Royal Life Saving Society Australia, RLSSA; prescribed Bronze Star Award); however, Karrie's students were not training to achieve the Award. The RLSSA Bronze Star is a secondary school award that aims to develop skills and knowledge of safe water rescue and survival (RLSSA 2012). It is not compulsory in the Australian school

curriculum, and holders of this award are not trained or qualified to attempt any form of contact rescue involving a conscious person in deep water. However, students are required to answer questions related to theory concepts (i.e. survival in water and priorities for rescue), successfully demonstrate resuscitation awareness (i.e. CPR) and display water-related competencies of rescue, resuscitation, accompanied rescue, defensive techniques, towing techniques, surface dives, underwater search skills, survival skills, and swimming skills (i.e. swim 300 m continuously).

During data collection, the lead author adopted a non-participatory role as an observer and maintained auditory contact with the teachers throughout. The observation foci were identified and headed on the observation guide as teacher action/context, teacher pedagogy, student activity/context, student-related focus/outcome, examples of differentiation, and general notes including issues, relationships, and quotes. School, general PE, and swimming-related documents were triangulated with observations and interviews. The teachers assisted the researcher to identify three students of varying abilities (relatively strong, moderate, and weak swimmers for each class), who were targeted for direct observation, and one of these three students was observed during each lesson (on a rotational basis). That is, these targeted student observations were conducted on one swimmer per lesson alongside general teacher/class observations. Also, after each lesson, these three 'target' students from each class provided post-lesson evaluative comments, which were documented in the observation schedule using a structured question-response format. These three students from each class also participated in a 30-min focus group interview at the end of the unit to discuss their perceptions about the learning experience. In addition, all students ($n = 103$) also responded to a one-time brief questionnaire (10 min) at the close of the data collection period, in which they were asked to indicate (using an agree/disagree continuum) whether (a) they felt it was important to learn how to be a safe swimmer, (b) the swimming lessons had helped them learn how to save people in water, (c) they would choose to pursue swimming again if it were optional, and (d) whether their swimming skills had improved. These questions were selected on the basis that they (a) matched the aims of the lessons (and thus largely matched the content that had been delivered in most instances) and (b) provided a global overview of a range of important perceptions relating to swimming (e.g. importance of water safety, lifesaving knowledge and ability, and swimming skills).

Data analysis

Observation data were inductively analyzed according to Tomlinson's (1995, 1999) model of differentiation, in order to create higher order categories relating to the primary aspects of teacher differentiation. Researcher observations were cross-checked with teacher and student interview comments. All interviews were tape-recorded and transcribed verbatim, before transcripts were coded in order to identify recurring themes. Having checked for missing data (and found no missing data points), percentage yes/no scores were calculated for student questionnaire data, in order to summarize respondents' perceptions.

Results and discussion

In the following sections, first results that focus on teachers' beliefs about differentiation are presented along with school-wide differentiation approaches (i.e. differentiation 'rhetoric'), before considering findings relating to the extent to which teachers actually incorporated differentiation processes in their instruction (i.e. differentiation 'reality').

The differentiation rhetoric

In its manual, Karrie and Annika's school claimed to respect individual differences, noting that 'we seek ... a curriculum that is differentiated'. In addition, both Karrie and Annika described the importance of differentiation in their approach to teaching. For example, Karrie noted that differentiation was 'something that you have to incorporate into your program ... and plan for' (Interview 2; 12), commenting later that differentiation was 'just part and parcel of teaching swimming in a phys-ed class, ... the numbers that you have got, means individualized needs' (Interview 3; 5). Similarly, Annika believed that 'everybody comes with different expectations and different things that they want to get out of it' (Interview 2; 6). As a result of those different needs, Annika expressed an intention to use tailored strategies and techniques, commenting that she sought 'different opportunities to find the teaching style or learning style that suits [the student] and at a level that is appropriate for them' (Interview 2; 9). At a school level, Ernie's institution did not identify a philosophical intention to differentiate; however, Ernie himself embraced a differentiated approach, claiming that the best teaching format was one that differentiated according to student needs, 'because it motivates the kids and gives them a sense of purpose', and 'it actually enhances the level of rapport you can have with some kids' (Interview 3; 6). As outlined in these excerpts, it appeared that all teachers acknowledged and endorsed the need to cater for differences in students' ability levels.

That said, the benefits of differentiation were discussed alongside the restrictions and limitations of implementing these practices, including space/numbers, time, and student readiness. According to Karrie, for example,

I think you can (differentiate) to a point, but ... there comes a point where the kids need smaller numbers ... with a coach to get them to extend [their learning]. I do not think you can (differentiate) ... where you have one teacher to twenty five kids. (Interview 3; 7)

Moreover, Ernie confirmed that a differentiated program 'is something that you don't want to launch into blindly' (Interview 2; 4). He believed that while it was possible to implement such an approach, it was 'very demanding sort of work' (Interview 2; 4) and was made particularly difficult as there were days during the term 'where I came home and I was pretty knocked around' (Interview 2; 4).

The differentiation reality

Although results are presented in this section separately for content, process/support, and product, it is important to be mindful that these elements of differentiation operate in a highly synergistic and interconnected manner. Given the lack of research on differentiation specific to swimming in PE, it was interesting to note how one Year 8 student seemed to capture the essence of this concept in this setting:

I would first ask people what they are good at and what they enjoy then I would split everyone into groups, not being mean, but I would put the more advanced people in one group and the less advanced in another. They would both do the same things but more advanced swimmers would do things harder ... for the last day, ask what kind of games you want to play. (Beatrice, Interview; 13)

Overall, observations exemplified differentiation for PE aquatic content (e.g. Ernie's formation of separate groups based on ability; Annika allowing students to work on self-

declared inefficiencies), process/support (e.g. Karrie's optional use of floatation aids, and lower ability students being allocated pool space nearest the wall side; Karrie and Annika's use of peer teaching strategies), and product (e.g. Karrie, Annika, and Ernie's peer evaluation and peer teaching and ongoing diagnostic student evaluation; Annika's formal assessment strategies mixed with varying degrees of instruction and immediate repeat opportunities). These findings are discussed in more detail with respect to each of the differentiation components in the following sections.

Content

Most of the students were very interested in advancing their aquatic competencies, with 93 (of the total 103) students indicating that it was important to learn how to be a safe swimmer and how to save people in water. In addition, more than 90% of Karrie and Ernie's Year 8 students (i.e. 45 of the total 49 students) declared that they would choose to pursue PE swimming if it were optional, and over two-thirds of Year 9 students (Annika's class = 17 of 24 students; Ernie's class = 23 of 30 students) would also pursue the option. Observational analyses revealed that the majority of Karrie's Year 8 program focused on technical analysis/correction (54.5%), with her attention primarily directed '...to the weaker and the moderate swimmers' (Karrie, Interview 3; 7). With this focus, Karrie believed that the low-ability swimmers improved their swimming, and she thought that some of the middle-ability girls also improved. The students echoed Karrie's thoughts, with 12 of the total 21 students agreeing that their swimming had improved. Karrie did, however, acknowledge that she was unable to extend the higher ability swimmers. Members of Karrie's class, Amber and Beatrice (both relatively strong swimmers), confirmed that they had not improved or acquired new knowledge, while Rumor, a relatively weak swimmer in Karrie's class, declared improvement on several strokes and her ability to swim in the sea.

Annika's Year 9 PE swimming unit was focused on meeting guidelines within a local introductory swimming/lifesaving award (i.e. RLSSA prescribed Bronze Star Award). Given that just under half of Annika's students (i.e. 11 of 24) passed the Award during the term and that a similar proportion (i.e. 9 of 24) believed that their swimming had improved, it is possible that Annika's instruction may have primarily targeted the higher ability swimmers.

However, the vast majority of the students (i.e. 20 of 24) believed that their ability to save someone had improved during the term. This notion was further supported with 22 of the students passing the resuscitation component of the Award. Annika's resolve to deliver all of the course content, in combination with a high level of student compliance and a class-based assistant teacher, resulted in the opportunity for the strongest swimmers to maximize their outcomes. This appeared to be supported through the target student observations, in so far as Sharon and Lisa (relatively stronger swimmers in Annika's class) both passed the Award, while Kate, a relatively weak swimmer, was unable to attain the required standard to pass the Award. The researcher judged some of the Award-based content (e.g. distance swim, underwater search pattern, and tow rescues) to be beyond the readiness level of the lower ability swimmers.

Ernie's Year 8 and Year 9 unit was also focused on the same swimming/lifesaving award. While Ernie delivered a program to both year levels that was essentially the same, he varied content for each of the three ability-based groups, with the weaker and moderate swimmers allocated more water confidence and survival activities and relatively fewer lifesaving tasks. In addition, he allocated some students to an assistant teacher for remedial work. Like Annika's students, approximately 80% of his Year 8 and Year 9

students (i.e. 46 of his total 58 students) agreed that their ability to save someone had improved during the term. Believing that the students 'at the very top end showed some improvement' (Ernie, Interview 2; 5), Ernie conceded that the opportunity to deliver the more complex learning activities was a challenge and was impacted on by having a large cohort of students in an aquatic environment. Focal students in Ernie's Year 9 class appeared to confirm Ernie's comments regarding the challenges of extending the high-ability swimmers. For instance, Joe, a strong swimmer, believed that he had not learned anything new, whereas Robert, the weakest swimmer in Ernie's Year 9 cohort, noted that he was able to swim for longer as a result of the swimming content. While nearly half of Annika's class achieved the Bronze Star Award, none from Ernie's students were successful. With the content commensurate to the physical readiness for a proportion of Ernie's students (field notes), when compared with Annika's class, factors such as lower levels of class compliance, four to six more students per class, and sharing the assistant teacher with other classes impacted on the student outcomes attained. Contrary to this, Ernie's PE swimming program was allocated significantly more time (Yr 8 = 790 min; Yr 9 = 820 min) than that afforded to Annika's class (550 min). While longer lesson time allocation, differing school context, and student expectations may have been responsible, familiar content was seen during the School B observations to impact negatively on student motivation, behavior, and ultimately outcomes. Further speculation of the importance and impact of the activities offered arose during Year 9 observations at School A. Despite high levels of student motivation and interest in achieving a swimming award, there was a perceived lower level of interest in undertaking the content as prescribed by the Bronze Star Award guidelines. The students were disenfranchised by content that was inferior to readiness levels.

Process/support

Provision of student choice was observed when Karrie allowed her students the option to use buoyancy aids, Ernie used discovery techniques, and Annika employed inclusion teaching strategies (Mosston and Ashworth 2002). Annika and Ernie allowed their students to work on self-declared areas of need by working on tasks of choice (practice and inclusion style) independent of their direct supervision. Self-evaluation, peer evaluation, and peer teaching were also observed (e.g. Ernie's class using a peer-observation rubric check sheet, Karrie using task cards combined with peer evaluation, and all teachers using reciprocal peer teaching). Observations confirmed that the students' aquatic proficiencies and readiness levels impacted on the lesson format deemed most appropriate by the teacher and reinforced their choice for a range of teaching strategies that evidenced a differentiated approach. Working across the pool best matched the needs of stroke technique evaluation and correction with the highest ability students in the deeper end of the pool, while Karrie placed the least able swimmers nearest the pool wall in the shallow water (field notes, 8 February) or closest to shore at the beach (Rumor, Interview). Small group stations allowed the weaker students to work together: 'comfortable but challenged' (Ernie, Interview 2; 6), 'without everyone knowing that maybe they are struggling' (Annika, Interview 2; 7). Being able to touch the bottom of the pool and one-on-one teacher assistance were seen as important differentiation techniques for the least able students. Teacher-directed drill work and a paired format better suited the middle-ability swimmers, while the stronger swimmers responded to 'giving them a situation ... then giving them the opportunity to figure it out for themselves' (Annika, Interview 2; 8). Sharon, a Year 9 state-level swimmer, agreed, 'maybe ... a teacher will show us but then ... [give us] 5 minutes just to spend working it out and practicing' (Interview; 3). The stronger swimmers responded

to reciprocal peer teaching/assessing, practice, and inclusion methods. However, this was dependent on student readiness, maturity, and compliance levels, which appeared to be related to gender – appealing more to the girls. Student behaviors at School B during reciprocal peer teaching and assessment, practice, and indirectly supervised class activities included casual play, disinterest, and an unwillingness to work (researcher, field notes). These uncooperative responses impacted on Ernie's teaching, having to stop a lesson and remove the Year 9 students from the pool for disciplinary reasons (field notes, 3 March), choosing to reject the results of peer assessment (field notes, 21 March), and minimizing the use of student-centered pedagogies. Ernie confirmed his frustration with some of the boys, noting, 'I've got 8 students, ... they have a maturity problem, they really can't handle it. Those 8 are holding back the others from working for their certificate' (Ernie, field notes, 21 February). It was concluded that some approaches (peer teaching and assessment without direct teacher supervision) that were placed too far above or below the level of the learner's readiness left the students challenged beyond their capacity to work alone. Inappropriately set challenges resulted in the students working outside their zone of proximal development and, as a result, being unproductive in class.

Notably, the success of peer teaching during Karrie's class also appeared to be related to the swimming ability of the student leader. When the non-participant peer teachers included higher ability swimmers at School A, the amount of feedback and the student outcomes were more positive (researcher, field notes). When low-ability swimmers were paired together during reciprocal activities, the challenge of assisting each other appeared beyond their capacity, while high-ability paired swimmers in the same lesson worked well (researcher, field notes). Further to this, Annika confirmed that her teaching approach was influenced by the existing abilities of the students. Peer-related teaching/assessing interested the high-ability swimmers, with one commenting, 'we could sort of help other people to show them how to do things and I like doing that, that's really fun' (Beatrice, Interview; 11). With respect to the use of peer teaching within the broader concept of differentiation, these findings provide insight into how this teaching strategy may provide different outcomes according to student ability levels. For example, for high-ability students, peer teaching might provide an opportunity for mastery beyond motor competencies in relation to interpersonal and self-regulatory skills, whereas for lower ability students it may simply provide opportunities for physical activity rather than motor development. Moreover, given that both the peer teacher and the learner were generally seen to benefit at School A, and the School B girls responded better to unsupervised work (researcher, field notes, 27 February; 27 March), the case observations evidenced the proposition that the success of peer-assisted/unsupervised teaching strategies were influenced by gender during PE swimming at the Year 8 and Year 9 levels.

Product

While the teachers believed that it was possible to differentiate content and process/support in the swimming classroom, differentiating for product was generally unrealistic in this context. Collaboration between the teacher and the students occurred to some extent, 'but I would say not a huge amount' (Karrie, Interview 3; 2). Karrie reported that asking students to show and talk about their performance, or partners' explanation of what they think they could do better, tended to be what happened (Karrie, Interview 3; 2). However, some product-related differentiation techniques were employed by the three teachers. Ongoing diagnostic student evaluation was exemplified by teachers observing student performance (researcher, field notes), particularly early in the course, to assist/

guide future lesson and unit activities. Informal peer assessment strategies, or student evaluations in the course of the teaching/learning process, were also observed. Karrie confirmed that she would normally include formal peer assessment by using the student recordings in determining the students' grade, but stated that the inclusion of three beach sessions, in an open-water, less controlled, and public environment, had prevented her from doing so. Ernie also provided the non-changed students with an observation rubric check sheet but was concerned with reliability issues.

The researcher noted the difficulties of operating in smaller groups with a teacher-centered approach to assessment, including the time-consuming nature of the approach and the problems of having large numbers of students inactive. Formal assessment, when undertaken within the teaching framework, and the opportunity to immediately repeat inappropriately performed tasks (researcher, field notes, 25 March), was seen to be very successful. Differentiation of assessment was problematic for those undertaking the swimming/lifesaving award, as assessment was framed by formalized needs of the Award process and was not flexible to the unique readiness and interests of the students.

Conclusions

Teachers may differentiate according to content, process/support, and product, all of which are encouraged to be implemented in response to the learner's readiness and interest levels. Teachers in this investigation professed a fundamental educational belief in differentiation and strived to meet the needs of individuals and the class. Learning outcomes were seen to be facilitated by the differentiation techniques employed, and these techniques included ongoing diagnostic student evaluation, different activities for different ability levels, provision of student choice, allowing students to work on self-declared inefficiencies, lower ability swimmers being allocated pool space nearest the shallow end or wall side, self-evaluation, peer evaluation, and peer teaching. While differentiated pedagogy was seen as essential and shown to elicit diverse student outcomes, which is a highly desirable quality (Light and Wallian 2008), even for those who were experienced teachers, such as Karrie and Ernie, the complex dynamic that defined PE swimming and the associated pedagogical issues presented significant challenges to meet the needs of all of the students. While the teachers displayed outcome-facilitating differentiation of content and process/support in the swimming classroom, they found it difficult to differentiate for product (e.g. assessment). That is, due to the use of the Award criteria, safety concerns, and the time-consuming nature of individualized assessment, it was difficult for teachers to assess students in a differentiated manner according to their relative initial ability and own individual progress throughout the program. For instance, high-ability swimmers were not assessed on relatively more difficult technical advancements that they may have made (e.g. requiring fewer strokes to swim a given distance) or on the additional skills that they may have developed aside from technical outcomes as a result of the program (e.g. interpersonal and self-regulatory skills). Moreover, the teachers' positive perceptions (and achievement) about differentiation strategies were moderated by the limitations of space/numbers, time, and student readiness. While the teachers facilitated some strong educational outcomes with their students, based on the limitations identified, the secondary school PE swimming teachers in this study found it difficult to meet the defined educational goals of the curriculum and provide for student experiences that promote maximum growth and success for 'all' of the students in the class (Csikszentmihalyi, Rathunde, and Whalen 1993; Tomlinson 1999, 2001).

In terms of design limitations and associated directions for future research, it is important to note the limited generalizability of these findings. Future studies that use a large-scale approach with a greater sample size may enhance the scope of the work in this area, and examining teacher behavior across a variety of activity contexts (e.g. soccer, swimming, and gymnastics) may enable greater insight into differentiated pedagogy across different settings. Moreover, in future it would also be worthwhile to assess a range of student learning outcomes, in terms of both technical competencies and additional (e.g. self-regulatory and interpersonal) skills, in order to explore the full range of potential student-related effects associated with teacher differentiation. Finally, given that teachers were, at times, unable to deliver their desired level of differentiation (in relation to their stated aims), intervention-based research which examines the utility of programs that are specifically designed to support teachers' efforts to differentiate content, process, and product within the context of student readiness and interest is warranted.

While the level of differentiation currently offered in PE aquatic programs and activities may be no less than that presented in other PE and school-based curricula, it should not deter PE educators from addressing this issue (Jewett and Bain 1985; Manross and Templeton 1997; Tomlinson 1999, 2001). Clearly, implementing a differentiated approach is not easy; however, this study supports the notion that these empowering and inclusive techniques might redress the decline in student interest in PE (Whipp 2004) and help to increase levels of participation (Williamson 1996).

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