Self-Reported Teaching Styles of Australian Senior Physical Education Teachers.

Abstract

The main purpose of this paper was to present the findings of research completed on the reported teaching styles (based on the work of Mosston & Ashworth 2002) that 110 teachers of Queensland Senior Physical Education believed they used and to establish how often they believed they used them. Participants included 110 secondary school physical education teachers of years 11 and 12 in the Australian state of Queensland. Data were collected using an adaption of the Kulinna, Cothran, & Regualos (2003) and the Cothran, Kulinna, Banville, Choi, Amade-Escot, Macphail, Macdonald, Richard, Sarmento and Kirk (2005) instrument which required participants to read 11 scenarios describing the teaching styles from the Spectrum of Teaching Styles (2002).The teachers in this study reported using a range of styles from both the reproduction and production clusters. The findings of this study indicate that numerous factors may influence teachers reported use of teaching styles and that further research is necessary to confirm if teachers are able to accurately report on the teaching styles they use.

Key words; Pedagogy, Teaching Styles, Physical Education

Introduction

As part of a cross-cultural analysis encompassing both government and non-government primary and secondary schools the study of Cothran, Kulinna, Banville, Choi, Amade-Escot, Macphail, Macdonald, Richard, Sarmento, and Kirk (2005) provided the first piece of published research to record the teaching styles reportedly used by physical education (PE) teachers (n=129) in the Australian state of Queensland. This study reported a range of styles used by Queensland teachers of PE. It used “an instrument designed to assess teachers’ use

and beliefs about teaching styles" (Cothran et al. 2005: 195). The instrument had previously produced reliable and valid scores in a population of teachers in the USA (Kulinna, Cothran, & Regualos 2003). The instrument was designed to examine teachers' beliefs about various factors (i.e., fun, effectiveness, motivation) using the Spectrum of Teaching Styles.

The Spectrum

The *Spectrum of Teaching Styles* (from this point on referred to as the Spectrum) is a theory constructed from a proposition that "teaching is governed by a single unifying process: decision making" (Mosston & Ashworth 2008: 8). In particular, with regard to decision making, it is about who is making the decisions, when the decisions are being made and the intent of these decisions. The Spectrum (2008) constitutes 11 teaching styles beginning with the *Command Style-A* and travels along to the *Self Teaching Style-K*. At the beginning at *Command Style-A*, the teacher is making the maximum amount of decisions and the student the minimum. In the *Self Teaching Style-K* the teacher is making the minimum amount of decisions and the student is making the maximum. Put in another way, there is generally less teacher direction at the *Self Teaching Style-K* than there is at the *Command Style-A.*

Styles that range from Styles A-E are known as the *reproduction cluster* due to them requiring the student to reproduce knowledge and thus rely on memory as the basic process of conscious thought. Styles from F-K are known as the *production cluster* as they require the student to produce knowledge that is new to the student and rely on either discovery or creativity as the basic process of conscious thought. Another way of summarising the Spectrum is that, as an individual travels along the Spectrum, they will move from more teacher-centered teaching styles to more student-centered teaching styles. Each style will be briefly outlined in the following section however a presumption of some knowledge has been made by the authors.

INSERT FIGURE 1 HERE

Command Style-A

Command Style-A is characterised by the teacher making all the decisions about the performance (e.g., start, finish, pace, amount of repetitions, time practiced) and the learner (or learners) following on cue. Learner decision making here is low, except for the decision about whether to do the task or not. The *Command Style-A* is the first style from the *reproduction* cluster of teaching styles.

Practice Style-B

The second teaching style on the Spectrum is the Practice Style-B. The defining characteristic of this style "is individual and private practice of a memory/reproductive task with feedback" (Mosston & Ashworth 2008: 94). For example, when teaching the volleyball dig, the teacher may give a demonstration (including the teaching cues) and then the learner will go and practice the task and the teacher will give feedback to the learner during or after the practice. The learner has moved along the Spectrum due to them now making decisions about the pace of practice or the number of practice attempts etc.

Reciprocal Style-C

The *Reciprocal Style-C* allows the learner to continue their movement along the Spectrum with the learner now making decisions about other learner's ability to perform a skill when compared to a teacher generated criteria sheet. This style is characterised by the teacher performing a demonstration of the skill to be practised. In pairs, learners will then practice the skill demonstrated by the teacher. Each learner has a role – one is the *doer* the other the *observer*. The *doer* performs the skill, while the *observer* watches the performance and

"offers immediate and on-going feedback to the doer, using a criteria sheet designed by the teacher" (Mosston & Ashworth 2008: 116). The learners will have the opportunity to perform both roles of the *doer* and the *observer.* This style is also from the *reproduction* cluster as both learners (the *doer* and *observer*) have been given a task that requires them to utilise *memory* as the dominant cognitive operation to complete it. That is, either *memory* of how to perform the task demonstrated at the beginning of the lesson, or in the case of the *observer*, *memory* of how the *doer* performed the task.

Self-Check Style-D

The next style from the *reproduction* cluster is the *Self-Check Style-D*. The *Self-Check Style-D* is characterised by the learner working independently and checking their own performances against a criteria sheet prepared by the teacher (Mosston & Ashworth 2008). It could be suggested that this style is more complex for the student (but not better) than the *Reciprocal Style-C* in that it requires the learner to now possess the skill of self-assessment rather than the assessment of another person. In terms of decision making, the teacher and students journey along the Spectrum continues with the learner now making decisions about their own ability to perform a skill or task when compared to the teacher generated criteria sheet.

Inclusion Style-E

The final style from the *reproduction* cluster is the *Inclusion Style-E*. "The defining characteristic of the *Inclusion Style-E* is that learners with varying degrees of skill participate in the same task by selecting a level of difficulty at which they can perform" (Mosston & Ashworth 2008: 156). The teacher's role is to create learning experiences with multiple levels of difficulty. The learner then makes the choice about where they enter the task in terms of level of difficulty. The teacher will also question the learner about the appropriateness of their choice.

Guided Discovery Style-F

The first teaching style crossing the *discovery threshold* is *Guided Discovery Style-F*. This style is characterised by the "logical and sequential design of questions that lead a person to discover a predetermined response" (Mosston & Ashworth 2008: 212). The teacher asks the learner the questions to lead the learner to a single correct skill, method, concept, principle or answer. It is important to remember that for the style to be *Guided Discovery Style-F*, the learner must not know the single correct answer before the questions are asked. A person cannot *discover* something that they already know. Mosston and Ashworth are quite clear about this concept stating that "if the learners already know the target concept, the objectives of this behavior are nullified and the question and answer experience reverts to a design variation of the Practice style (a review)" (213).

Convergent Discovery Style-G

The differences between the previous style and *Convergent Discovery Style-G* are again in who is making decisions, when the decisions are being made and the purpose of these decisions. In the previous style (*Guided Discovery Style-F*), the teacher prepares the question and decides on the sequence in which they are asked. In the *Convergent Discovery Style-G* requires the learner to discover a 'correct' (predetermined by the teacher) response using the convergent process (Mosston & Ashworth 2008). The role of the teacher is "to design the single question delivered to the learner" (Mosston & Ashworth 2008: 237) and "the role of the learner is to engage in reasoning, questioning and logic to sequentially make connections about the content to discover the answers" (Mosston & Ashworth 2008: 237).

Divergent Discovery Style-H

The *Divergent Discovery Style-H* differs from those previously described in that the learner is now discovering multiple solutions or responses to a specific question or task from the teacher rather than one solution.

Self-Reported Teaching Styles.

Learner Designed Individual Program Style-I

This style is characterised by the learner's independence to "discover a structure that resolves an issue or problem" (Mosston & Ashworth 2008: 274). The teacher designates only the subject matter (e.g., you will learn about basketball). The learner's independence is emphasised as they are now required to discover and design "the questions or problems and seek the solutions" (Mosston & Ashworth 2008: 275). The *Learner Designed Individual Program Style-I* is different to all previous styles in that it cannot be accomplished in one episode or classroom lesson. Usually a series of *reproduction* and *production* episodes, designed by the learner, are required. From these characteristics, this style can be seen as quite time-consuming, especially in terms of planning for the learner, as they are "responsible for designing, sequencing, and linking the episodes" (Mosston & Ashworth 2008: 275).

Learner Initiated Style-J

This style on the Spectrum continues to move more of the responsibility for decision making to the learner, and therefore more independence for the learner. The *Learner Initiated Style-J* is characterised by "the learner's initiation of and responsibility for designing, the learning experience" (Mosston & Ashworth 2008: 283). The anatomy of this style requires the learner to "make all the decisions in the pre-impact, including which teaching-learning behaviors will be used in the impact, and create the criteria decisions for the post-impact" (Mosston & Ashworth 2008: 283). The difference between the *Learner Initiated Style-J* and the previous style (the *Learner Designed Individual Program Style-I*) is that the learner has initiated this style themselves, not the teacher. The role of the teacher in the *Learner Initiated Style-J* is that of "stand-by resource-a guide or advisor who is available to the learner" (Mosston & Ashworth 2008: 284).

Self-Teaching Style-K

Self-Reported Teaching Styles.

The defining characteristics of the *Self-Teaching Style-K* is the "individual tenacity and the desire to learn" (Mosston & Ashworth 2008: 290). The individual takes on the role of student and teacher in the *Self-Teaching Style-K*. The learner makes all the decisions in the pre-impact, impact and post-impact sets. It is important to note that this style "does not take place in the classroom" (Mosston & Ashworth 2008: 290).

Reported teaching style usage

A cross-cultural analysis by Cothran and colleagues (2005) regarding teaching styles claimed to be used by over 1400 primary and secondary teachers across seven countries showed that the most commonly used styles were *Command Style-A, Practice Style-B* and *Reciprocal Style-C.* The results of support earlier assumptions or suggestions that teaching styles from the *production* cluster of teaching styles (i.e., styles that may require the student to produce new knowledge and use Higher Order Thinking skills as the dominant cognitive operation) occurred less than the teaching styles from the *reproduction* cluster (Mosston & Ashworth 2008). This suggestion is based on the concept that the production of knowledge requires creativity or discovery (Hewitt, Edwards, Ashworth & Pill 2016; Runco 2004). Furthermore, Cothran and colleagues suggested teachers may over-estimate the variety of teaching styles they use. Cothran and colleagues found that the most obvious example of this behaviour was "the teachers' reports of their use of the self-teaching style. It is unlikely that teachers are able to use the *Self-Teaching Style-K* in school settings, yet teachers from five countries reported using that style frequently over 10% of the time" (16). Cothran and colleagues also found that 1400 teachers self-reported using teaching styles from the *reproduction* cluster more frequently than teaching styles from the *production* cluster. Similar results were obtained in other studies. Byra (2007: 4) summarised Spectrum research from around the world and found that "based on direct teacher observation, styles A-E are used more frequently than styles F through H. *Practice Style-B* was used more frequently

than any other Spectrum teaching style" (see Curtner-Smith, Todorovich, McCaughtryt, & Lacon 2001; Curtner-Smith, Hasty, & Kerr 2001). Preferences for teaching styles may exist also between genders as some researchers (Abdurrahman & Nilüfer, 2012; Jaakkola & Watt, 2011; Kulinna & Cothran, 2003; Zeng, 2016) have found that teachers of both genders prefer reproduction cluster styles while others (Al-Mulla, 1998; Macfadyen & Campbell, 2005) have found that female teachers reportedly use styles from the reproduction cluster less than males. While Cothran and colleagues (2005) did not report any differences between genders or primary and secondary teachers they did report differences between nations. The comparative research outlined (Cothran et al. 2005) provided the motivation for a study of the teaching styles of Queensland senior secondary PE teachers.

Curriculum context

This research was undertaken to produce, for the first time, information on the teaching styles used by secondary school teachers of Queensland senior secondary (aged 16-17 years) PE. Since this research was completed the Queensland senior secondary syllabus has had one update (QSA, 2010) and a new syllabus is due for implementation in 2019. The Queensland Senior Physical Education Syllabus (QSPES) (2004) outlines that teachers of the subject need to use a wide variety of teaching styles or "pedagogical approaches, for example, guided discovery, inquiry, cooperative learning, individualised instruction, games for understanding and sport education" (28). Further to the teaching styles mentioned the QSPES (2004) requires that learning experiences "should develop students as self-directed, interdependent and independent learners" (29) and sets the conditions for the awarding of an 'A' or 'B' standard in physical performance whereby a student must a) implement physical responses through reflection and decision making and b) independently solve problems by demonstrating solutions in new or unrehearsed contexts. Given that numerous teaching styles are specified to be used by the QSPES, and that no one teaching style can encompass all learning objectives

(Mosston & Ashworth, 2008), teachers of senior physical education in Queensland would need to use a range of teaching styles to achieve syllabus goals. However some research (Chambers & Armour, 2011; Thorburn & Collins, 2006) have shown that there are gaps between official curricula and *enacted* curricula, meaning what is written in policy and what happens in classrooms is not always the same The investigators proposed that the Spectrum was a pertinent tool for an examination of teaching styles used by Queensland senior secondary PE in the delivery of the QSPES as it clearly defined every teaching style – through its definition of teaching being a chain of decision making. This definition of teaching (based on decision making) distinctly describes 11 landmark teaching styles that represent different teaching and learning experiences and would allow teachers to report the range of styles they used when teaching senior physical education.

Method

The primary purpose of this study was to determine which teaching styles teachers of Queensland Senior PE reported using, and how often they reported using them. The research was guided by two questions: (a) "What teaching styles do teachers of Senior Physical Education (years 11 and 12) in Queensland believe they use to teach Senior Physical Education?"; and, (b) "Do teachers of Senior Physical Education in Queensland use a range of teaching styles or is there a dominant style being used?"

Prior to data collection starting university research ethics clearance was obtained. All participants were made aware of what the research entailed.

The choice of a questionnaire to collect data is informed by Berg and Latin (2004), who state that surveys and questionnaires are "designed to measure practices, opinions, or other such variables" (199). As the research was investigating a practice (teaching styles of teachers) based on the opinion of the participant teacher, a survey was an appropriate tool. A factor unique to surveys is that "rather than a researcher observing a particular behaviour, the

subject reports it" (Berg & Latin, 2004: 199). As Cothran and colleagues (2005) had used a similar tool in their cross-cultural study (which included the state of Queensland-Australia, along with six other nations, to collect teachers' beliefs about their use of teaching styles), the use of a similar survey allowed for comparison of the data between the two studies to be made. With regard to reliability, the instrument used by Cothran and colleagues showed high levels of internal consistency among items related to teachers' beliefs about teaching styles, and the Cronbach alpha coefficients (a measure of internal consistency) ranged from 0.84 to 0.92. Construct validity was determined using cross-comparison of analysis of variance (assessment of potential differences).

From a list of Queensland schools teaching senior secondary PE, 77 schools were sent a questionnaire which sought background information as well as responses related to the frequency of use of styles of teaching from the Spectrum. As a list of teachers teaching senior secondary PE was impossible to obtain, the number of senior secondary PE teachers at each school was estimated, based on student numbers. This meant that 286 questionnaires were sent to the 77 schools. Altogether, responses from 37 schools were returned. The schools from which responses were obtained represent just over 11% (11.25%) of schools teaching senior secondary PE in the state of Queensland. One hundred and ten (n=110) individual teacher respondents (from the 37 schools) to the questionnaire were received. This represents 38% of individual questionnaires returned out of the 286 questionnaires sent out.

Numerous strategies were utilised to ensure a high return rate. For example, Singleton and Strait (2005) state "the most important factors in generating high return rates are reducing the costs for the respondent and increasing the perceived importance of the survey" (243). They suggest such strategies as reply-paid envelopes, making questionnaires shorter and easier to complete, making special appeals in the cover letter, personalising correspondence and using a follow up letter as an effective way to ensure higher rates of return of questionnaires.

The Tailored Design Method is another strategy used to ensure a minimum of 100 respondents. This method recommends using three widely spaced follow-ups. The first follow up is "sent out 2 weeks after the original mailing, [and which] consists of a postcard thank you/reminder" (Singleton & Strait, 2005: 258). The second follow up is mailed out two weeks later and is sent "only to non-respondents and contains a replacement questionnaire" (258). The third follow up mailed out four weeks later and emphasised "the importance of the respondent's cooperation" (258).

Survey Tool

The questionnaire utilised for this research was a modified version of the tool used by Kulinna and colleagues (2003) and Cothran and colleagues (2005). The questionnaires in these studies were designed to, "examine teachers' use of and beliefs about (i.e., fun, effectiveness, motivation) the Spectrum of Teaching Styles" (Cothran et al., 2005: 8). The revised survey tool was developed by the researcher in conjunction with researcher 2 and Sara Ashworth. Ashworth brought a detailed knowledge of Spectrum to the formulation of the questionnaire. The questionnaire format was based on the Cothran and colleagues' (2005) instrument, which was a modified version of a questionnaire used in Kulinna, Cothran, and Regaulos (2003). After a detailed analysis of the scenarios from the Cothran and colleagues' (2005) questionnaire, and comparing the descriptors to Mosston and Ashworth's (2002) definitions, it was concluded by the chief investigator and Ashworth that the scenarios did not accurately reflect the styles described in *Teaching Physical Education* (2008).

In addition to the inadequacy of the scenario descriptors in describing individual teaching styles another reason why the Cothran and colleagues' (2005) instrument was not used was that its purpose was to examine teachers' use of and beliefs about the Spectrum (Mosston & Ashworth 2008). In particular, the Cothran and colleagues' instrument was designed to

measure teachers' perceptions about fun, effectiveness and motivation. This research was not attempting to measure these aspects as it related to beliefs about practices. An instrument was needed to measure how often teachers believe they use certain teaching styles from the Spectrum to teach senior secondary PE. Therefore, new scenario descriptors were written that more accurately reflected the styles of teaching. Additionally, items *b-d* (b) *I think this way of teaching would make class fun for my students*; (c) *I think this way of teaching would help students learn skills and concepts*; and, (d) *I think this way of teaching would motivate students to learn)* from the Cothran and colleagues' instrument were omitted. Discussions, principally between researcher 1 and Ashworth were used to develop a revised questionnaire, and then the draft version of the instrument was again subject to scrutiny from researcher 3 as a final development step. This process took six months and involved condensing around 24 pages of text and information on each style of teaching into descriptors of the decision making structure between learners and teacher for a style that the chief investigator and Ashworth believed 'best' described the intent of the Spectrum. The survey instrument is shown as **Figure 2**.

INSERT FIGURE 2 HERE

As previously noted, the primary difference between the instrument developed and the one used in the other two Spectrum studies (Cothran et al. 2005; Kullina et al. 2003) mentioned relates to the wording of the scenario descriptors used to describe the various styles of teaching. Another difference is that the previous instruments used word rating terms like ''never', 'sometimes', 'always' whereas the instrument developed for this research used a 1-5 Likert Scale and the terms 'Not at all', 'Minimally', 'Here & There', 'Often' and 'Most of the time' This is more in line with a non-versus approach in that it does not reflect absolutism in describing behavior.

Data Analysis

The researchers were not seeking to explain relationships between groups or the effect of an intervention on teachers' behaviour. Similarly no patterns of behavior between groups of teachers were being researched either. As the primary purpose of this study was to determine which teaching styles teachers of Queensland Senior PE reported using, and how often they reported using them, data was collated into a set that represented how often teachers believed they had used a teaching style during that year (questionnaires were sent out after 12 weeks of schooling in the school year had passed by the time teachers were responding). The teaching styles used by teachers of QSPE and the frequency of reported use by the participants in this study were relevant as the QSPES (2004) called for a variety of styles to be used.

Results

The results in this section of the study provide a description of the reported teaching styles used by Senior PE teachers (based on the Spectrum) and the frequency with which they were used by the participants. The table below (**Table 1**) shows the breakdown of responses for data collected with the questionnaire tool. The teaching styles from the Spectrum are listed in the first column.

INSERT TABLE 1 HERE

Examination of the descriptive data collected with the questionnaire tool (see **Table 2**) shows that teachers reported using the *Practice Style-B* the most (94.5% *'Here & There to Most of the Time'*) of all the styles.

INSERT TABLE 2 HERE

Self-Reported Teaching Styles.

When responses were grouped as *'Here & There to Most of the Time'* the three styles that the respondents claimed to use the most were *Practice Style–B (94.5%), Command Style–A (77%)* and *Divergent Discovery Style–H (73.6%).*

Command Style-A

This style was reportedly used '*Here & There to Most of the Time*' by 77% of the participants (84 teachers) in their teaching. This level of usage was the second most reported teaching style.

Practice Style-B

This style was the most reported style by participants in this study with 104 teachers (94.5%) reporting to have used it '*Here & There to Most of the Time*'. The *Practice Style-B* was also the only style that was claimed to be used by all (n=110) respondents at some time during the teaching year.

Reciprocal Style-C

The *Reciprocal Style–C* was the fifth most reportedly used style by the 110 participants with 66.3% or 73 of respondents using it *'Here & There to Most of the Time'.*

Self-Check Style-D

The *Self-Check Style-D* was reportedly used by 52.7% of teachers (58 teachers) '*Here & There to Most of the Time*'.

Inclusion Style-E

The *Inclusion Style-E* was the least reported style used from the *reproduction* cluster of styles. Less than half (47.2%) of the participants (52 teachers) reported using this style *'Here & There to Most of the Time'. Inclusion Style-E* is one of the three styles where there was a substantial difference between the reported usage of this style in Cothran and colleagues' (2005) data (78.6% 'Here & There to Most of the Time') and the data recorded in this research (47.2% *'Here & There to Most of the Time'*). This difference may be due to the fact

that the Cothran and colleagues' data included primary school teachers and a wider variety of ability levels may exist in primary school physical education classes (where physical education is compulsory).

Guided Discovery Style-F

The *Guided Discovery Style-F* was the sixth most reportedly used teaching style with 57.2% of respondents (63 teachers) claiming to use this style *'Here & There to Most of the Time'.* This is an interesting result as *Guided Discovery* is mentioned specifically by the QSPES (2004) – although it is unlikely to have been a Spectrum specific connation – when it suggests to teachers that teaching styles or approaches should include "a range of pedagogical approaches, for example, guided discovery, inquiry, cooperative learning, individualised instruction, games for understanding and sport education" (Queensland Studies Authority 2004: 28).

Convergent Discovery Style-G

With 77 (70%) teachers' claiming to use this style '*Here & There to Most of the Time*' it is the fourth most commonly used style by the participating teachers.

Divergent Discovery Style-H

The reported usage of the *Divergent Discovery Style-H* in this study (73.6%) was similar to results that Cothran and colleagues (2005) reported (73.7%), with 81 respondents to the questionnaire claiming to use this style '*Here & There to Most of the Time*'. This reported usage also makes it the style from the *production* cluster that is claimed to be used most frequently.

Learner Designed Individual Program Style-I

62 (56.3%) respondents to the questionnaire tool claimed (with regard to this style) that they taught in this way '*Here & There to Most of the Time*'. Again this result may be influenced by the concept in the QSPES (2004) of "self-directed, interdependent and independent

learners" (QSPES 2004: 2-3). This paragraph in the QSPES mentions the phrase 'independent learners' four times in 12 lines of text clearly emphasising the value of this concept. The QSPES (2004) clearly states that "the capacities to become self-directed, interdependent and independent learners are developed and enhanced throughout the course of study" (2). In contrast to the Cothran and colleagues (2005) use of a combined primary and secondary teacher cohort, perhaps the secondary school PE teachers who responded to the questionnaire in this study were mindful of this concept – when reporting how often they used specific teaching styles.

Learner Initiated Style-J

24 (21.8%) teachers who responded to the questionnaire use this style '*Here & There to Most of the Time*'. This reported usage is slightly higher than Cothran and colleagues (2005) recorded (13.5%).

Self-Teaching Style-K

Irrespective of this statement, 13.6% of teachers (15 respondents) claimed to be using this style '*Here & There to Most of the Time*'. This result was quite similar to the Cothran and colleagues' (2005) results where they recorded 11.9% of respondents indicating that they used this style *'Sometimes to Always'.*

Discussion

This research sought to identify: (a)"What teaching styles do teachers of Senior Physical Education (years 11 and 12) in Queensland believe they use to teach Senior Physical Education?"; and, (b) "Do teachers of Senior Physical Education in Queensland use a range of teaching styles or is there a dominant style being used?"

Reported teaching styles

With eight of the 11teaching styles being reportedly used over 50% of the time (*'Here & There to Most of the Time'*) the teachers who completed this questionnaire believe they use a wide range of teaching styles as defined by the Spectrum of Teaching Style (2008) to teach Senior PE in Queensland.. This result is supported by others (Byra 2007; Cothran and colleagues 2005; Hewitt 2015; Hewitt, Edwards, Ashworth & Pill 2016; Jaakola & Watt 2011; Syrmpas, Digelidis & Watt 2015) who have reported similar findings. Based on these results it can be argued that teachers of the QSPES (2004) were teaching Senior PE with the intent which the curriculum had intended and are creating learning experiences using a wide variety of teaching styles from the Spectrum which may equate to descriptions such as "guided discovery, inquiry, cooperative learning, indivdualised instruction, games for understanding and sport education" (QSA 2004: 28). However, this outcome would only be possible by the teacher having a thorough knowledge and grasp of a wide range of teaching styles labelled by some as a 'toolkit' (Pill 2012). The acquisition of a range of teaching styles is only likely when teachers have acquired these in their preservice training or undertaken appropriate professional development that has allowed for the attainment of a degree of mastery in a range of contexts. Based on this assumption it is suggested that it is therefore necessary to undertake research to verify if there is an incongruence between self-reported teaching styles and observed teaching styles.

Range of styles

As noted earlier teachers in this research reported using a wide variety of styles. Cothran and colleagues (2005) suggest that it is encouraging that teachers reported using many styles. Spectrum theory would submit that teachers should use teaching styles which achieve the stated learning objectives. In this case the QSPES (2004) has clear learning objectives (*acquiring*, *applying* and *evaluating*) all equally weighted when awarding a grade. It can then

be concluded equal time should be given to learning across the three general objectives. With this being the case it could be argued that teaching styles which facilitate higher order thinking, such as *evaluating* (production cluster), should have been reported equally to styles from the reproduction cluster. However this was not the case with *Command Style-A (77%) reportedly being used 'Here and There to Most of the Time', Practice Style-B* reportedly being used over 94% of the time '*Here and There to Most of the Time'* and *Divergent Discovery Style–H* only being reportedly used 73.6% of the time when classified as '*Here & There to Most of the Time*'. This data is consistent with Goldberger and Howarth (1993) in Hasty (1997), who found after reviewing literature that the *Practice Style-B* was used most frequently. The research data in this study has also supported Hastys' (1997) results that showed, "the practice style was employed four times as often as the command style, style A" (52). It was also consistent with Cothran and colleagues' (2005) findings about Australian PE (primary and secondary) teachers – with teachers reportedly using the *Command Style-Style A* 93.1% of the time *'Sometimes to Always'* and the *Practice Style-B* 92.1% of the time *'Sometimes to Always'* (see **Table 2**). This result is similar to previous research by Byra (2007) that showed that "teachers used styles A and B more frequently than the three other teaching styles from the reproduction cluster" (Byra 2007: 5).

Similarly guided discovery is clearly stated by the QSPES (QSA, 2004) as a teaching style which needs to be used yet *Guided Discovery Style-F* was the sixth most reportedly used teaching style (57.2%). Other recommended styles to be used in the teaching of the QSPES include cooperative learning and Games for Understanding. Cooperative learning could in part be achieved through *Reciprocal Style-C* and it could be argued (due to its student centred nature) that Games for Understanding would be taught through styles from the *production cluster*. However these styles were reportedly used 20-30% less than *Practice Style-B.* Cothran and colleagues (2005) suggest that results of teacher beliefs about the teaching styles

they employ should be interpreted cautiously, as some research has indicated that teachers may not be able to provide accurate descriptions of their own teaching behaviors (Good & Brophy 1997).

An example of this may be seen in the reported usage of the *Learner Initiated Style-J* and the *Self-Teaching Style-K*. The results led the researchers to consider that confusion about, or a lack of understanding of teaching styles, is evident in this sample of participants. Mosston and Ashworth (2008) clearly state that, for *the Self Teaching Style-K*, "this teaching learning style does not exist in the classroom" (Mosston & Ashworth 2008: 290). The questionnaire also included in the scenario descriptor the wording "this style is not initiated by the teacher" (SueSee, Ashworth & Edwards 2006: 5). Considering these results and factors, it is reasonable to contend participants in this study reported using these two styles because they did not fully understand the styles. Cothran and colleagues (2005) found a similar percentage of respondents reported (the *Learner initiated Style-J* was reportedly used 13.5% of the time *'Sometimes to Always'*, and the *Self-Teaching Style-K* was reportedly used 11.9% of the time) usage of this style.

The tendency to overestimate has some support from Cothran and colleagues' (2005) study. The most obvious example is the teachers' reports of their use of the *Self-Teaching Style–K*. It seems highly unlikely that teachers are actually using the self-teaching style in school settings, yet teachers from five countries reported using that style frequently over 10% of the time. Other research also reported similar occurrences of this. Davis and Sumara (2003) found that teachers will adopt specific language yet they will continue to teach in ways that are informed or influenced by a traditional objectivist approach to learning–arguably teaching in the same manner that they were taught when they were at schools and observed as teachers on professional placement. Other research (Syrmpas, Digelidis, Watt & Vicars, 2017) found

that PE teachers' limited use of production cluster styles may be due to their prior beliefs about pedagogy or how they were coached or taught (Moy, Renshaw & Davids, 2013).

Conclusion

This paper reported on the self-identified teaching styles used by teachers of Senior PE (Queensland) and their self-reported frequency using Mosston and Ashworth's Spectrum of Teaching styles (2008). Results indicate that teachers predominantly use one teaching style (*Practice Style-B, 94.5%*) when teaching Senior PE followed by *Command Style-A (77%)* and *Divergent Discovery Style-H (73.6%).* Knowing which teaching styles teachers use to teach Senior PE allows some conclusions to be drawn about the implementation of the QSPES (2004) document and the tailoring of professional development to support teacher's knowledge of teaching styles. Knowledge of teaching styles can assist teachers in choosing appropriate pedagogy to assist them in meeting lesson objectives. It is suggested that future research should focus on confirming the teaching styles used by teachers of senior physical education in the state of Queensland. It is also proposed that further research should focus on the teaching styles teachers use when teaching the new Australian Curriculum–Health and Physical Education (ACARA, 2016). The five interrelated propositions (Focus on educative purpose (Take a strengths-based approach, Value movement, Develop health literacy and Include a critical inquiry approach) of the AC HPE (ACARA, 2016) outline the distinctive character of contemporary HPE as a learning area. Little empirical consideration of the impact of the propositions on the teaching styles of teachers is yet to occur in the literature although Stolz and Pill (2017) argued that curriculum documents have little impact on pedagogical practice and "that there is a gap between the proposition for a new curriculum to demonstrate the value of learning 'about', 'through' and'in' movement (2017: 77). As this document (AC HPE, 2016) has, for the first time in Australia, created a common HPE

curriculum with some consistency of learning objectives then it may be suggested that commonalities in teaching styles used to implement the syllabus would be recorded. The *Spectrum Inventory* (2006) instrument is considered to be particularly useful in the self-assessment or reflection by teachers of their teaching styles; for researchers seeking a more effective understanding and application of the Spectrum*;* and, as an instructional and feedback instrument for those who work in Physical Education Teacher Education (PETE) courses. In support of an understanding of the Spectrum and as a training instrument for the use of the *Spctrum Inventory* (2006), it may be useful for future researchers or physical education teacher educators to complete a video resource on the teaching styles and how to use the inventory to observe and record these. The *Spectrum Inventory* (2006) could also be used to evaluate teaching styles of PE teachers using the new Australian Curriculum Health and Physical Education–Foundation–Year 10 (The Australian Curriculum-Health and Physical Education, 2016) to find adherence to implied expectations of the framework and its key idea for critical inquiry, and whether the interpretation of the ACHPE (2016) leads to similar umbrella of teaching styles across the country. It is also recommended that future research using the *Spectrum Inventory* (2006) to evaluate senior secondary PE teachers "toolkit" of teaching styles in comparison to each state in Australia and their syllabus document expectations could be completed. This would also allow a comparison of practices between states.

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