

## Developing the descriptions of landmark teaching styles: A spectrum inventory

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### Abstract

*Mosston & Ashworth's Spectrum of Teaching styles was first published in 1966 and is potentially the longest surviving model of teaching within the field of physical education. Its longevity and influence is surely testament to its value and influence. Many tools have also been developed through the years based on The Spectrum of Teaching Styles. In 2005 as part of a doctoral study, this tool was developed by the author, Dr Edwards and Dr Ashworth for researchers and teachers to identify which teaching styles were being utilised from The Spectrum when teaching physical education. It could also be utilised for self-assessment of the teaching styles and individual uses, or those who work with Physical Education Teacher Education courses. The development of this tool took approximately 4 months, numerous emails and meetings. This presentation will outline this process, along with the reasons why such a tool was developed and the differences between it and others like it.*

**Keywords:** Spectrum inventory, Teaching styles

### Introduction

Dr. Muska Mosston formulated the *Spectrum of Teaching Styles* and presented it to the field of physical education in his book *Teaching Physical Education* (1966). His basic premise was that there were a range of teaching styles from reproduction to production.

In 1969, Sara Ashworth met Muska Mosston and became involved in further developing and refining the framework which now is associated with both their names. Since its original outline there have been major changes in the Spectrum theory culminating in its most recent version outlined in *Teaching Physical Education* (Mosston & Ashworth, 2002, 5th edition).<sup>1</sup> The Spectrum of Teaching Styles has become seen to have value and relevance to the field of physical education. The teaching styles identified are:

<i>Reproduction:</i>	<i>Production:</i>
Style A – Command	Style F – Guided Discovery
Style B – Practice	Style G – Convergent Discovery
Style C – Reciprocal	Style H – Divergent Discovery
Style D – Self Check	Style I – Learner Designed Individual Program
Style E – Inclusion	Style J – Learner Initiated Program
	Style K – Self Teaching

This article will outline the design, development and refinement of an instrument designed to identify beliefs by physical education teachers about how often they use teaching styles based on Mosston & Ashworth's (2002) Spectrum of Teaching Styles in their teaching. In addition, an explanation will be made about the differences between the instrument developed and others serving a similar purpose.

An outline has been presented of some of the personal experiences of developing the instrument related to the Spectrum of Teaching Styles.

#### *Developing the Spectrum Inventory*

Many research instruments have been developed over the years based on the Spectrum of Teaching Styles. In 2005, as part of a doctoral study, and along with Prof. Sara Ashworth and Dr. Ken Edwards, a Spectrum Inventory instrument was developed for researchers and teachers to identify which teaching styles from the Spectrum of Teaching Styles were being utilised by selected secondary school physical education teachers.

The development of the instrument was undertaken over a period of three months and required numerous email communications and/or meetings with the co-developers. As part of a more complete appreciation of the efforts made to develop and refine a worthwhile Spectrum Inventory instrument it is helpful to outline the development process involved. The discussion will include reasons why such an instrument was necessary and present points which highlight the differences between it and other instruments serving similar purposes.

#### *Development of the instrument*

In 2004 research was conducted on a general review of literature in pedagogy, which included literature and research on Mosston & Ashworth's Spectrum of Teaching Styles (Mosston & Ashworth, 2002, 5th edition). An important part of the review was to find instruments that may have been used to collect data on how often teachers had used certain teaching styles from the Spectrum of Teaching Styles to teach physical education. The impetus for this search for appropriate instruments was the desire of the researcher to

investigate the use of teaching styles from the Spectrum of Teaching Styles during senior physical education (years 11 and 12) classes in the State of Queensland, Australia.

The topic originally proposed for doctoral study sought to undertake a comparative study of what teaching styles were being used pre-1998 in the Senior Health and Physical Education Syllabus (BSSSS, 1986) and post-1998 in the Senior Physical Education Syllabus (QSA, 1998 and revision 2004).<sup>2</sup> With the introduction of new syllabuses in 1998 health education and physical education had become separate courses of study. The Senior Physical Education Syllabus (QSA, 1998 and revision 2004) has been described as ‘innovative’ and during a review of the pilot syllabus (BSSSS, 1998) it was described as “the leading edge of curriculum development in Australia and internationally” (Reddan, 2000, p. 130). The Board of Senior Secondary School Studies (now part of the Queensland Studies Authority) suggested that “there is very little else currently under way in the English speaking world to match developments in Queensland” (BSSSS, 1998, p. 43).

One of the innovations of the new course of study was that the 1998 Senior Physical Education Syllabus (BSSSS, 1998) suggested pedagogical approaches or teaching styles that should be used such as “guided discovery, inquiry, cooperative learning, individualised instruction, and games for understanding and sport education” (QSA, 2004, p. 28). Another innovation was the integration of theoretical work (Focus Areas) and practical work (Physical Performance) – and for the work to be personalised. The Health and Physical Education Syllabus (BSSSS, 1986) did not take the steps of naming specific pedagogical approaches. However, as the new syllabus explicitly named specific teaching styles, it could be predicted that a wider variety of teaching styles would be observed in post-1998 Senior Physical Education Syllabus implementation when compared to the pre-1998 Health and Physical Education Syllabus.

It had been hoped that data on Queensland senior school physical education teachers and their teaching styles had been collected (for the pre-1998 Health and Physical Education Syllabus) and all that would be required was to collect post-1998 syllabus data to complete a comparative study of the two documents. In the interests of academic integrity and validity of the proposed study it was also expected to use the same instrument in the comparison of syllabus documents. Unfortunately, for research planned (and for an understanding of physical education in Queensland), no such study of teaching styles used in the ‘older’ syllabus existed. It would have been quite interesting to know – other than through anecdotal, interview information and review panel reports – what teaching styles were used in delivering the pre-1998 Senior Health and Physical Education Syllabus (BSSSS, 1998) and then observe and assess teaching styles used in the post-1998 Senior Physical Education Syllabus (QSA, 1998 and revision 2004).

As with many doctoral studies, the originally proposed research evolved into something a little different. The revised study comprised of a teaching styles based questionnaire survey of teachers at selected schools (and from different regions of Queensland) followed by interviews with, and then observation of, a sample of respondent teachers. The selected teachers were interviewed and then videotaped teaching lessons conducted during a single unit of work during the Senior Physical course of study at their particular school. The video-recording was later coded using a research instrument which

was designed for the study along with an instrument designed by Prof. Sara Ashworth called the Identification of Classroom Teaching-learning Styles (2002).

As well as the changes to the original proposal for research there was a quest to find and/or develop a suitable instrument that could be used to observe and record teaching styles used by teachers of physical education. This instrument also had to allow teachers to recognise various teaching styles and then provide a response about those that they believed that they used.

To gain any relevant insights it was decided to seek assistance from one of Australia's most respected curriculum academics in physical education, Prof. Doune MacDonald, at the University of Queensland. She was contacted with the question, 'Are you aware of any research ever done on what teaching styles are being used by Australian or Queensland teachers of physical education?' To the researcher's surprise and good fortune came the response, "The only teaching styles work in Qld that I know of I did as part of an international comparative study on teaching styles i.e.- it was a survey of Qld HPE teachers' decisions about which styles they used and why" (MacDonald, personal correspondence, April 2005).

Prof. MacDonald had been part of group completing a comparative study – this group included Cothran, Kulinna, Banville, Choi, Amade-Escot, MacPhail, Richard, Sarmento and Kirk – entitled, 'A Cross-Cultural Investigation of the Use of Teaching Styles' (2005). The researchers used a data gathering instrument known as the Teacher's Perceptions of Teaching Styles (2000) instrument. With this information available it seemed that this might be a very appropriate instrument to use. However, on closer inspection, it became evident that there were reasons why the Teachers' Perceptions of Teaching Styles Instrument (2000) instrument would not be suitable. A significant reason was because the purpose of the instrument was to examine teachers' use of and beliefs about the Spectrum of Teaching Styles (Mosston & Ashworth, 2002). In particular, the Teachers' Perceptions of Teaching Styles Instrument had been specifically designed to measure teachers' perceptions about fun, effectiveness and motivation. As the planned research was not attempting to measure these factors, the instrument, though a very useful resource and starting point, was not able to be utilised in its existing form.

The Teachers Perceptions of Teaching Styles Instrument (2000) included a scenario for each of the eleven teaching styles (outlined in the Spectrum of Teaching) followed by the statements: *a)* 'I have used this way to teach physical education', *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' (See Table 1.). The instrument used a five point Likert scale (from 1=never to 5 always).

**Table 1** An example statement from the Teachers Perceptions of Teaching Styles (2000) showing the use of a Likert Scale.

	Never		Sometimes		Always
I have used this way to teach physical education.	1	2	3	4	5

After thoroughly reading the scenarios – which provided good insights and very useful information – outlined in the questionnaire for each of the teaching styles, these were compared with definitions and descriptors about the Spectrum of Teaching from Mosston & Ashworth’s Teaching Physical Education (2002). It was decided that some of the scenarios did not accurately reflect some of the teaching styles intent or behaviour. While the Teacher’s Perceptions of Teaching Styles (2000) instrument did not fit the researcher’s purpose it was the instrument reviewed that seemed to most closely reflect Spectrum of Teaching Styles definitions.

In 2005, through collaboration with Prof. Sara Ashworth and discussions with study supervisor (Dr. Ken Edwards), new scenarios were developed which it was considered would more accurately reflect each of the teaching styles. Items 2-43 (which related to the factors not relevant to teaching styles and the proposed research) from the Teacher’s Perceptions of Teaching Styles instrument were omitted. During the development process the researcher communicated with Prof. Sara Ashworth numerous times. The following include examples of questions that were posed:

I was wondering what you think of the definitions of Style B, Style C and style D? I find the use of the word "might" in styles C & D somewhat confusing. I always feel stupid quoting your own book to you, but p. 119 and p. 150 (Mosston & Ashworth 2002) seem to indicate that these definitions are missing a critical part of these styles.

Style B definition does not seem as confusing, but there is no explanation of "The teacher continues with the subject matter explanation/demonstration and the logical expectations" (Mosston & Ashworth, 2002, p. 97). The definition seems to indicate that the teacher is not presenting the task/subject matter, rather they have just set up stations and said "Go for it!" (Ashworth, email correspondence, May 2005).

Queries such as the ones outlined were courteously and meticulously answered. The feedback was applied and a revised questionnaire and draft version of the instrument was sent back to Prof. Sara Ashworth for more ‘fine-tuning.’ During the development process Prof. Sara Ashworth not only provided invaluable feedback but also much appreciated encouragement and motivation. The development process demonstrated how – based on quality feedback and the goodwill of Prof. Sara Ashworth – the ‘power’ of the internet was instrumental in allowing for efficient collaboration in finalising the instrument that was to be used in the study. The researcher and Prof. Sara Ashworth, along with input by Dr. Ken

Edwards, had developed an instrument which they all believed 'best' described the intent of the Spectrum of Teaching Styles.

The resulting Ashworth, SueSee & Edwards (2005) Spectrum Inventory instrument was used as part the field research. Since its original development and use in the doctoral research the instrument has been further refined and developed. The revised version has been released on the Spectrum of Teaching Styles website at <http://www.spectrumofteachingstyles.org/> and is now identified as the Description of Landmark Teaching Styles: A Spectrum Inventory (2007). Even though each style descriptor is an abbreviated form of itself, "the descriptions do provide a mutually exclusive image with the essential factors of the different teaching styles" (Ashworth, 2007, p. 2).<sup>4</sup>

The latest version of the Spectrum Inventory 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 of Teaching Styles; and, as an instructional and feedback instrument for those who work in Physical Education Teacher Education (PETE) courses.<sup>5</sup> In support of an understanding of the Spectrum of Teaching Styles and as a training instrument for the use of the Spectrum Inventory it may be useful to complete a video resource on the teaching styles and how to use the inventory to observe and record these.

*The differences in the instrument reviewed and the instrument designed*

This paper has referred to two instruments – one that was developed as part of doctoral studies – through the process outlined – and an instrument that had been used in other studies. The Spectrum Inventory (2005) instrument designed is somewhat different to the one used by Cothran et al. (2005) and in the Kulinna, Cothran & Regualos (2003) study entitled, Teachers Perception of Teaching Styles. The primary difference between the instrument developed and the one used in the studies mentioned relates to the definitions used. Every scenario descriptor or description of each teaching style (outlined in the instrument used in the other studies) was reviewed and re-written for use in the original Ashworth, SueSee & Edwards (2005), Spectrum Inventory instrument. The development process had involved reviewing the Cothran et al. (2005) instrument definitions or scenario descriptors and then comparing the scenario descriptors with the text book descriptions of teaching styles from Teaching Physical Education (Mosston & Ashworth, 2002, 5th edition).

It is believed that the definitions that were developed – and as mentioned previously – for the Spectrum Inventory (2005) instrument more closely reflect the teaching styles and are less ambiguous than those outlined in the other instrument examined. This claim is supported by Prof. Sara Ashworth who suggests that the purpose of the Spectrum Inventory designed has been, "to provide unambiguous teaching descriptions that most closely capture the individual image of each landmark teaching style along the Spectrum" (2007, p. 1).

Another key difference between the Teachers Perception of Teaching Styles instrument and the Ashworth, SueSee & Edwards (2005) instrument is the descriptors used for the Likert scale. The descriptors for the Teachers Perception of Teaching Styles instrument used the terms 'Never', 'Sometimes' and 'Always'. Each of these words represented the numbers 1, 3 and 5 respectively. There was no word descriptor assigned to

the numbers 2 and 4. Prof. Sara Ashworth suggested that these terms be changed and also words assigned/associated with each of the numbers. The words on the Likert scale became, 'Not at all' (1), 'Minimally' (2), 'Here & there' (3), 'Often' (4) and 'Most of the time' (5).

Yet another difference between the Spectrum Inventory (2005) and the Teachers Perception of Teaching Styles instrument was in their purpose. The Teachers Perception of Teaching Styles instrument was designed to "examine teachers' experience with, and perceptions (i.e., fun, effectiveness, motivation) of, the eleven teaching styles" (Cothran et al., 2005). On the other hand the Spectrum Inventory (2005) instrument was designed to measure how often teachers believe they use certain teaching styles from the Spectrum of Teaching Styles to teach the current Senior Physical Education Syllabus (2004) in Queensland. The Spectrum Inventory could easily have scaling methods applied to record how often physical education (or for that matter any subject area) teachers believe they teach the various teaching styles – but it does not seek to measure fun, effectiveness or motivation.

**Table 2** An example of one scenario from the Spectrum Inventory (2005) showing different Likert Scale Descriptors and focusing on measuring how often a teaching style was used.

Scenario Style	Scenario Descriptor				
A	The students perform the task, selected by the teacher, in a unison, choreographed, or precision performance image following the exact pacing (cues) set by the teacher.				
How frequently do I use this description to teach my senior physical education lessons throughout the year?	Not at all	Minimally	Here & there	Often	Most of the time
	1	2	3	4	5

*Validation of the Spectrum Inventory*

While the Teachers Perception of Teaching Styles instrument has been validated and the teaching scenarios that represent the eleven teaching styles was validated in an earlier study (Cothran, Kulinna & Ward, 2000), a phenomenon occurred which, at first glance, seems contradictory for a data gathering instrument. Mosston and Ashworth quite clearly state that the Self Teaching Style-K "does not exist in the classroom" (2002, p. 290). Mosston and Ashworth go on further to state that, "this behaviour cannot be initiated or assigned by a teacher in the classroom, it does not exist in the classroom" (Mosston & Ashworth, 2002, p. 290). Despite this information the Kulinna, Cothran and Zhu (2000) study found that when using the Teachers Perception of Teaching Styles instrument there were teachers who reported using this style – and they were not alone. As previously

mentioned, Cothran et al. (2005), found teachers also reported using this style (see **Table 3**). This occurrence is reported in other research where commonly – either through misunderstanding of terms, unfamiliarity with the teaching styles, or, in a misinterpretation of their own teaching – teachers claim to use teaching styles that they actually do not or cannot use. These comments have support in reviewing work conducted by Curtner-Smith et al. (2001), Sicilia & Delgado (2002) and Sicilia-Comacho & Brown (2008).

**Table 3** A comparison of Cothran et al. (2005) and the percentage of teachers who reported using the eleven teaching styles ‘Here & There to Most of the Time’ from this research.

Teaching Styles	SueSee 2005 Percentage of Teachers Reported Using This Style ‘Here & There to Most of the Time’	Cothran et al. 2005 Percent of Teachers Indicating Use of ‘Sometimes to Always’ for Each Style-Australia
Command - Style A	77%	93.1%
Practice - Style B	94.5%	92.1%
Reciprocal - Style C	66.3%	85%
Self Check - Style D	52.7%	46.9%
Inclusion - Style E	47.2%	78.6%
Guided Discovery - Style F	57.2%	70.6%
Convergent Discovery - Style G	70%	73.6%
Divergent Discovery - Style H	73.6%	73.7%
Learner Designed Individual Program - Style I	56.3%	40.4%
Learner Initiated Program - Style J	21.8%	13.5%
Self Teaching - Style K	13.6%	11.9%

While the final instrument, the Spectrum Inventory (2007 version), has not been validated, its credibility lies most particularly in the contribution and oversight of Prof. Sara Ashworth. If Prof. Sara Ashworth does not know her own Spectrum theory, and how to best



describe the landmark teaching styles of the Spectrum of Teaching Styles, then the question must be asked, “Who does?”

### Conclusion

While some instruments based on the Spectrum of Teaching Styles were identified and examined none were designed to collect the research data specifically required. As part of doctoral studies a research instrument was developed which would measure the self-reported (and later observed) use of teaching styles based on Mosston & Ashworth’s (2002) Spectrum of Teaching. The instrument developed was called The Spectrum Inventory. It was successfully used to collect data about the use of teaching styles from teachers of senior physical education in the state of Queensland, Australia during 2005.

Since this initial instrument was used during data gathering for a doctoral study some modifications have been made. The final instrument – Developing the Descriptions of Landmark Teaching Styles: A Spectrum Inventory (2007) has been made available on the Spectrum of Teaching Styles website. Despite the minor changes made the purpose of the instrument still remains the same as the instrument used as part of the doctoral research.

It is anticipated that university academics, researchers, teachers and students will be able to readily use the Spectrum Inventory instrument and perhaps help to refine it further. In using the instrument it is expected that its users will have a much clearer understanding and focus with regards to both understanding and observing teaching styles identified by the very useful Spectrum of Teaching (Mosston & Ashworth, 2002).

The outline of the design, development and refinement of the Spectrum Instrument presented will hopefully add to a much greater appreciation and application of the teaching styles work as presented by Mosston & Ashworth (2002).

#### Notes:

1. An online copy of the book is available from the Spectrum of Learning Styles website: <http://www.spectrumofteachingstyles.org/>

2. The Senior PE syllabus document is now being rewritten as part of a review process of all syllabus documents in Queensland.

3. These items referred to fun, effectiveness and motivation. For example:

*- I think this way of teaching would make class fun for my students.*

*- I think this way of teaching would help students learn skills and concepts.*

*- I think this way of teaching would motivate students to learn.*

These specific statements are from the Kulinna et al. (2000) study.

4. This comment has been taken from the latest refinement of the Spectrum Inventory instrument.

5. It is considered that the work of Mosston and Ashworth has applicability across all subject areas and the instrument developed could be seen to have a much wider role in educational research.

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