

Exploring Mosston's Spectrum of Teaching Styles usage and perception among student teachers of Sultan Idris Education University

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This study aimed to explore sports science student teacher's ($n = 100$), usage and perceptions of Mosston's Spectrum of Teaching Styles. The study adopted a qualitative approach of document analyses to investigate the predominant styles used by the student teachers during their teaching practical session in schools. This research, too employed a survey to explore their perceptions about the different teaching styles. The finding revealed 46% student teachers' lesson predominantly used style B (practice style), followed by 38% style A (command style) especially in teaching fitness topics in their practical teaching session. Findings indicated there were significant differences in perception of using 11 different teaching styles where $F(10,1089) = 13.67$, $p < 0.05$, indicated style B was the most perceived teaching style followed by style H (divergent production style) and style F (guided discovery style) among student teachers. Finding indicated only style G (convergent discovery style) was significantly favoured by female student teachers (4.27 ± 1.52) compared to male counterparts (3.81 ± 0.82), $F(1,98) = 3.91$, $p < 0.05$. The findings revealed that there were no significant differences in perceptions between reproduction (teacher-centered) and production (learner-centered) cluster of teaching styles, $t = (1098) = -.396$, $p > 0.05$. In conclusion, more effort had to be done in Malaysia to develop more holistic pedagogical styles

Key words: Teaching styles; student teachers; usage and perception of Mosston teaching styles

Introduction

As Metzler (2005) pointed out, separating teaching styles with instructional model is sometimes difficult and teaching styles play an important role in teaching sports and games in physical education. Light (2008) indicated that teaching games and sport are a complex process, spontaneous, more unpredictable, more alive, dynamic and even chaotic that needs complex teaching and learning theory to guide teachers. Applying multiple teaching styles, perhaps, could support a more holistic pedagogical framework of teaching and learning sports and games physical education.

Students may vary in learning styles, intelligence, or self-regulation (Armstrong, 1994; Curry, 1999; Kulina & Cothran, 2003). Student teacher as well as in-service teacher should try out multiple teaching styles to suit varying learning styles,

intelligence and self-regulations. The selection of teaching style or learning activity is dependent upon learning situation including factors as such as (i) a philosophy about how students learn, (2) the subject matter to be taught, (3) the teacher, (4) the learning environment, and (5) time. Furthermore, when adopting various teaching styles it is more likely that learners will find one suited to his/her own learning style (Harison, 1993) The basic for learning is perception, although many facts and experiences are presented to students, the ones they will remember are dependent upon their awareness of the words or ideas to be learned. Ideas and skills may be omitted, distorted, or only partially remembered because of different perception of the learners. What the learners perceive is influenced by their attitudes, expectations, motivation, previous experiences. Perception is enhanced by five senses – sight, touch, kinesthetic awareness, smell, taste and hearing. The more senses used to teach something, the better the learner perceives the subject (Harison, 1993). Cothran *et al.* (2005) indicate research in physical education lack research on teachers' perceptions related to Mosston's Teaching styles

On the other hand, Malaysian Physical Education curriculum is geared towards producing critical and creative learners (Malaysian Ministry of Education, 2002), therefore student teachers and inservice teachers too ought to be critical and creative in their teaching. However, in reality it all depends on the teacher's perceptions and usage of multiple teaching styles that they employ in their daily teaching activities to produce creative and critical students. Noted by Morgan and Hansen (2008), teachers' or practitioner's perceptions are important to school's physical education lessons in producing critical and creative learner. The way teachers conduct their teaching lessons strongly reflects their perceptions and teaching behavior. Inservice teachers or student teacher's ought to try out various compatible teaching styles suiting different learning styles of their students as to mould them to be critical thinkers, problem solver, decision makers and creative as well (Cuickshank, Jenkins & Metcalf, 2003; Morgan, & Kingston, 2005).

We can go on discussing in details the importance of different and multiple teaching styles but it serves no purpose without teachers strong perception in the importance of different teaching styles in teaching and learning. Cothran *et al.* (2005) indicate perceptions and belief can influence a full range of teaching behaviors, including selection of content as well as delivery styles. Athos and Gabarro (1978) in Cothran *et al.* (2005) too indicate that an individual belief is the assumptions he or she hold about the world and self. The individual belief is personal and powerful that can shape teachers teaching styles. Kulina and Cothran (2003) indicate that increasing recognition as well as diversity in student learning styles is the need to use different teaching styles.

Through experience and observation, teaching physical education in Malaysia, were basically taught by using station teaching and command styles as main methods of teaching. Little is known about Malaysian student teachers' perceptions and usage of various teaching styles in their teaching practicum session in schools. No matter how the styles are conceptualized, the ability to teach different ways to match the wide variety in students, content, and educational goals suggests that effective teachers should master multiple teaching styles. According to Cothran and Kulina (2008), the importance of teacher's knowledge can influence and allow more effective teaching. Teachers' knowledge is a key to effective teaching. According to Cothran, Kulina and Ward (2000) many different teaching styles have been proposed that range from a focus on a singular style such as cooperative learning to a wider range of options.

One of the more thoroughly developed teaching style theory in Physical Education is Mosston's Spectrum of Teaching Styles (Mosston & Ashworth, 2002).

According to Cothran *et al.* (2005), teachers' understanding and beliefs the abilities of each teaching styles to reach different goals can lead to teachers understanding of pedagogical content knowledge. The teaching instruction is a comprehensive and coherent plan for teaching includes link theories of teaching and learning that teachers should promote in gymnasium (Cothran, Kulina & Ward, 2002; Metzler, 2000). Theories of teaching directly influence teacher's perceptions, belief and behavior in their classroom teaching. Research on belief and usage of Spectrum of Mosston's teaching styles have been translated in many language and influence world physical education pedagogy (Cothran *et. al.*, 2005). Physical educationists around the world have embraced the Mosston and Ashworth Spectrum of Teaching styles theory as a framework for delivering instructions in schools (Byra, 2002. According to Mosston the fundamental issue in teaching is not which style of the 11 styles is better but which style is appropriate with learning objective and no supremacy each style. Mosston and Ashworth Spectrum of Teaching Styles are divided into the reproductive and productive aspects of teaching styles. The reproductive or teacher-centered styles or the memory cluster, deductive in nature involving cognitive level operation such as memorization, recalling, identification ,sorting and suitable style for skill learning which include the command (A), practice (B), reciprocal (C), self-check (D) and inclusion (E) teaching styles. In this cluster teachers may be engaged in various cognitive operations and the role of the learners to be receivers who reproduce the knowledge or skills in the designated memory cognitive operations While the productive cluster or learner-centered styles that promote discovery learning include guided discovery (F), convergent discovery (G), divergent production (H), learners individual design program (I), learner-initiated (J), and self-teaching (K). In this cluster teaching-learning behaviors shift when the teacher introduces different stimuli/questions that move learners across discovery process (Byra, 2002; Mosston & Ashworth, 2002). Teaching behavior in the Spectrum of Teaching styles as a "chain of decision making", The anatomy of styles categorises decision making before (pre impact), during (impact) or following (post impact) the interaction between the teacher and learner. The teaching style identifies, who makes the decision, whether it is teacher or learner (Buck, Lund, Harison & Cook, 2007).

The purpose of this study is to explore student teachers' (male and female) usage and perception of using Mosston and Ashworth spectrum of teaching styles. Specially, the study sought to answer the following questions: (1). What are the predominant teaching styles and the corresponding topic adopted by male and female trainee teachers in teaching practical sessions in schools? (2) What are the teaching styles perceive to be effective by trainee teachers? (3) Are there any differences between male and female trainee teachers' perceptions about the effectiveness of different teaching styles? (4) Are there any significant difference in perception among student teachers between reproduction with production cluster of teaching styles?. The research employ qualitative document analysis method as suggested by Merriam (1998) via lesson plan document as to answer research question 1. Exploratory questionnaire survey design has been used to answer research question 2, 3 and 4.

Studies by Chatoupis (2009) revealed college students preferences for teaching styles were based the subject matter and sex. They were more interested in using style A (command Style) in karate class and the style E (inclusion style) in racquetball class. Furthermore, college students in fitness courses perceived greater benefit using style D (self-check style) and style H (divergent production). Furthermore, in gymnastics classes female school children reported higher rating for Inclusion, Divergent Production and Individual program-learners' design styles (Chatoupis, 2009). Meanwhile findings from

Byra (2006) revealed that direct teaching styles or reproduction such as Style B (Practice Style) together with the other reproduction styles A, C, D and E remain fancied styles in teaching physical education. Another study by Cai (1998) indicated that college students preferred and perceived command style (A) a reproduction style karate and racket classes. Experimental research findings too indicating style B, E and H showed that there were significant improvements in skill execution in various sports and games such as shooting, karate, hockey and volleyball (Boyce, 1992; Golberger & Gerney 1986; Goldberger & Howarth, 1993; Harrison, Fellingham, Buck & Pellet, 1995). In findings for style E (Inclusion Style), student teachers indicated there was significant improvement in juggling skill in soccer (Beckett, 1990).

Method

Participants in the current study were $n = 100$ intact group respondent (male, $n = 60$: female $n = 40$) sports science and physical education trainee teachers from the Sultan Idies Education University, Malaysia (SIEU). All participants were given oral consent and were assured their anonymity. The first part of this research utilized qualitative document analysis as suggested by Merriam (1998). In this research a total of 21 trainee teachers lesson plans documents were randomly chosen by researcher to analyze the styles that they fancied during their teaching practical session in secondary schools. The second part of this research, a total of 100 respondents were used to explore regarding their perceptions of using Mosston and Ashworth teaching styles via a short questionnaire. The questionnaire consisted a short, descriptive, scenario about the styles of teaching preferred by trainee teachers, the styles which motivated the students as well as the styles that help students learn skills and concept was written for each of 11 teaching styles.

Data Collection and Instrument

Document analysis

A total of 21 lesson plans of student teachers that was actually used in practical teaching sessions were analysed using qualitative content analysis. The researchers systematically worked through transcript assigning codes, which may be numbers or words, to specific characteristic within the text. The researchers also listed contents of lesson plan into themes; (a) teaching styles preferred by student teachers and gender, (b) teaching styles with corresponding topics

Questionnaire

Participants completed modified questionnaire, adapted from Cothran *et al.* (2005) that assessed student teachers' usage and perception about Mosston and Ashworth Teaching Styles. The modified instrument was designed to examine trainee teachers' usage and perceptions about 11 different teaching styles from Spectrum of Teaching Styles (Mosston & Ashworth, 2002) and includes a scenario for each of the 11 styles followed by three 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 concept. The instrument uses a 5-point Likert-type scale (1 = never, 2 = seldom, 3 = sometimes, 4 = often and 5 = always. A listing of the

scenarios is presented in Table 1 (Cothran *et al.*, 2005, p.196) Test for reliability using modified questionnaire instrument of Cothran *et al.* (2005) with three items in each teaching styles from spectrum of eleven teaching styles was conducted. The reliability of the scores were estimated through assessing the internal consistency using Cronbach's alpha (.76 for 33 items, $n = 30$)

Table 1. Teaching style scenarios

Styles		Descriptions
A	Command	The teacher breaks down the skills into parts and demonstrates the right way to perform the skills. Students try to move when and exactly how the teacher tells them. The teacher provides feedback and the students try to look like teachers model
B	Practice	The teacher makes several stations in the gym where students work on different parts of a skill or different skills. Students rotate around the stations and do the tasks at their own pace. The teacher moves around and helps students when needed
C	Reciprocal	Two students work together on a task and check their own work. The teacher might give them a checklist so that the students can provide feedback to themselves while they learn the task
D	Self check	Students work alone on a task and check their own work. The teacher might give them a checklist so that the students can provide feedback to themselves while they learn the task
E	Inclusion	The teacher designs a learning task and there are several levels of difficulty. Students choose the level at which they want to work. Students can decide to make the task easier or harder by changing levels of the task to match their ability
F	Guided discovery	The teacher asks students to discover a solution to a movement problem. The teacher asks students a series of specific questions and the students try out their answers until they discover the right answer that the teacher wanted them to discover
G	Convergent discovery	Students try to learn a skill or concept by using logical. The teacher asks a question and students try to reason and think about different solutions. By critically thinking about the question and trying solutions, students can discover the single, right answer
H	Divergent production	The teacher asks students to solve a movement question. The students try to discover different movement solutions to the teacher's question. There are multiple ways for the students to answer the question correctly
I	Learner's individual designed program	The teacher picks the general subject matter, but the student makes most of the decisions about the learning experience. The students decides what will be learned within the teacher's guidelines, and then designs a personal learning program with consultation from the teacher
J	Learner's initiated	The student decides what will be learned as well as how it will be learned. The teacher and students set some basic criteria, but the student is responsible for all the decisions about how and what to learn. The teacher can help with information if the student needs it.
K	Self teaching	The students decide everything about learning something new. They even decide if they want to involve the teacher or not. The teacher accepts the student's decisions about learning.

Data analysis

Qualitative method of content analysis using themes of topics and different teaching styles that were adopted by male and female trainee teachers during their teaching practical session was also analyzed. One-way ANOVA and paired *t*-test were performed to analyse student teachers' perceptions about the effectiveness of different teaching styles. A one way ANOVA also tested to find out any differences between male and female trainee teachers perceptions about the effectiveness of different teaching styles. Furthermore independent *t*-test also carried out to see difference in perceptions between reproduction (Style A-E) and production (Style F-K) clusters of teaching styles.

Results

Based on lesson plan analysis in Table 2, out of 21 trainee teachers, 46% student teachers, $n = 12$ (male = 5; female = 7) have used predominantly practice style in their practical teaching of physical fitness topic and followed by 38%, $n = 10$ (male = 4; female = 6) have used command style as their next favorite style of teaching games and fitness, while 8%, $n = 2$ (male = 2) used guided discovery style, 4%, $n = 1$ (male = 1) used self-check style and only 4%, $n = 1$ (male = 1) used divergent production style. A one way ANOVA indicated there was significant difference in perception of using different teaching styles, $F(10, 1089) = 13.67, p = 0.01$. Based on Post Hoc (Sidek) pair wise comparisons, the result indicated there was significant difference in perception of trainee teachers as they fancied practice style compared with command style ($p = .022$), reciprocal style ($p = 0.01$), self-check style ($p = 0.01$), learner's individual designed program style ($p = 0.01$), learner initiated style ($p = 0.01$). However there is no significant difference in perceptions between practice style with guided discovery style ($p = .62$), convergent discovery style ($p = .218$) and divergent production ($p = .668$). Pared *t*-test result indicated also based on highest and lowest mean comparison for ($n = 100$) respondents perceptions in using teaching styles, there was significant difference between practice style (4.41 ± 1.78) with self-check style (3.25 ± 3.25), $t(99) = 5.77, p = 0.01$. This result indicated highest number of trainee teacher's perceive that practice style to be most effective compared to the other styles. One-way ANOVA indicated there was significant difference between gender of using only convergent discovery style ($F(1,98) = 3.91, p < 0.05$ (female, $n = 42, 4.27 \pm 1.52$); male, ($n = 58, 3.81 \pm .82$) compared to the other styles. The other styles indicated no significant different between gender: command style $F(1,98) = .006, p > 0.05$, practice style ($F(1,98) = 1.04, p > 0.05$, reciprocal style ($F(1,98) = .79, p > 0.05$, self-check ($F(1,98) = .77, p > 0.05$, inclusion style ($F(1,98) = .045, p > 0.05$, guided discovery style ($F(1,98) = .89, p > 0.05$, , divergent production style ($F(1,98) = 1.47, p > 0.05$, learner's individual program style ($F(1,98) = .48, p > 0.05$, learner initiated ($F(1,98) = .83, p > 0.05$, and self teaching ($F(1,98) = .51, p > 0.05$. The means and standard deviation trainee teachers' perceptions about different teaching styles are shown in Figure 1 and Table 3. The dominant styles perceived by trainee teachers in ranking based mean score are Style B, H, G, F, A and E. The findings also revealed that no significant difference between reproduction and production cluster of teaching styles, $t(1098) = -.396, p > 0.05$.

Table 2. Lesson plan analyses of teaching styles usage

Respondent/ Gender	Topic	Teaching Styles	Class /Students
1. Male	Heading Technique in Soccer	Guided Discovery and Command	Form 1/Boys
2. Female	Physical Fitness (speed running)	Practice and Command	Form 3/Girls
3. Female	Ball Control and Marking in Netball	Command and Practice	Form 3/Girls
4. Female	Physical Fitness (speed and accuracy)	Practice and Command	Form 3/Girls
5. Male	Fitness test (Cardiovascular test)	Practice	Form 4/Boys
6. Male	Dribbling in Soccer	Teaching Games for Understanding and Divergent Production	Form 2/Boys
7. Male	Over Head and Bouncing Pass in Hand ball	Practice	Form 2/Boys
8. Male	Physical Fitness (Flexibility)	Practice	Form 1/Boys
9. Female	Physical Fitness (Muscular Fitness)	Practice	Form 1/Girls
10. Male	Physical Fitness (Strength)	Practice	Form 2/Boys
11. Female	Physical Fitness (Flexibility)	Command	Form 1/Girls
12. Female	Physical Fitness (30 m and 60m speed training)	Command	Form 2/Girls
13. Female	Physical Fitness (Cardiovascular Fitness using Par course method)	Practice	Form 2/Female
14. Male	Physical Fitness (Cardiovascular Fitness using 2.4km method)	Command Guided Discovery	Form 3/Boys
15. Female	Netball (Chest Pass)	Command	Form 1/Girls
16. Male	Softball (Receiving and Passing)	Command and Constructive	Form 3/Boys
17. Male	Hand ball (Chest Passing)	Practice	Form 2/Boys
18. Female	Physical Fitness (Cardiovascular Fitness- using Par course method)	Practice	Form 1/Girls
19. Male	Biomechanics' and Motor Control in Basketball	Self Check	Form 4/Boys
20. Female	Physical Fitness (Mobility Exercises)	Practice and Self Access	Form 1/Girls
21. Male	Passing in Soccer	Command	Form 3/Boys

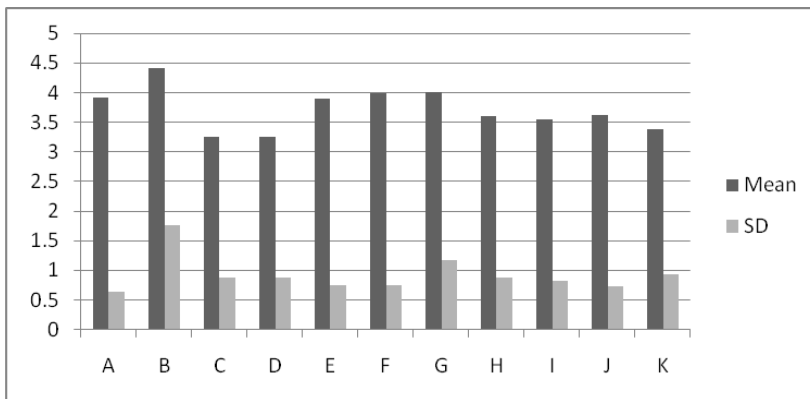


Figure 1. Means score for student teachers' perception of using teaching styles.

Table 3. Means and standard deviations of student teachers' perceptions using teaching styles

Styles		N	M(SD)
Command (A)	Female	42	3.91(.60)
	Male	58	3.90(.69)
	Overall	100	3.91 (.65)
Practice (B)	Female	42	4.63(2.66)
	Male	58	4.26(.61)
	Overall	100	4.41(1.78)
Reciprocal (C)	Female	42	3.35(.98)
	Male	58	3.19(.82)
	Overall	100	3.26(.89)
Self-check (D)	Female	42	3.35(.98)
	Male	58	3.19(.82)
	Overall	100	3.25(.88)
Inclusion (E)	Female	42	3.88(.63)
	Male	58	3.91(.85)
	Overall	100	3.90(.76)
Guided Discovery (F)	Female	42	4.07(.67)
	Male	58	3.93(.85)
	Overall	100	3.99(.78)
Convergent Discovery (G)	Female	42	4.27(1.52)
	Male	58	3.81(.82)
	Overall	100	4.01(1.18)
Divergent Production (H)	Female	42	4.25(1.55)
	Male	58	3.96(.77)
	Overall	100	4.10(1.17)
Learner's individual designed program (I)	Female	42	3.61(.89)
	Male	58	3.50(.78)
	Overall	100	3.54(.83)
Learner initiated (J)	Female	42	3.70(.60)
	Male	58	3.56(.82)
	Overall	100	3.62(.73)
Self teaching (K)	Female	42	3.50(.98)
	Male	58	3.33(.89)
	Overall	100	3.39(.93)

Discussion

Qualitative data indicates that style B (practice style) is most widely used and experienced by student teachers in their practical teaching session in secondary schools especially in teaching physical fitness topics, followed Command teaching style in teaching games and fitness topics. The present findings supports the findings of Chatoupis (2009), reveals that students teacher preferences for teaching styles were based on the subject matter and sex. The present findings regarding the usage of style A (Command style) as a second favourite style among student teachers is parallel with findings of Chatoupis (2009), college students are more interested in using style A (command style) in the karate class and the inclusion style in racquetball class. Furthermore, similar parallel findings reported from Chatoupis (2009) study, college students in fitness courses perceived greater benefit using style D (self-check) and style H (divergent production)

Findings regarding cluster of teaching styles reveal SIEU student teachers' perceive, use and is in favour of production cluster (style A-E). The probable reason why the student teachers prefer reproduction styles such as style B (practice) and style A (command), especially teaching physical fitness unit, is probably because the students are only exposed to two styles, and less exposed to the variety of other different teaching, even though Mosston's Spectrum of teaching styles has influenced research and fancied by teachers for more than 30 years around the world including Malaysia. The results of this study indicate research of using Spectrum of Teaching Styles is unfinished as noted by Cothran *et al.* (2005), therefore more research need to explore the perception and practical usage of these styles.

Findings indicated the student teachers have highest perceptions of using Practice Style, a reproduction style compared to other styles of command Style (A), reciprocal Style (C), self-check Style (D), learner's individual designed program style (I), and learner Initiated style (J). The findings of highest perception of practice styles (B) among the student teachers in this research is in line with findings of Byra (2006) in his analysis direct teaching styles or reproduction such as practice style (B) together with the other reproduction styles A, C, D and E remained fancied styles in teaching physical education. The significant findings of practice style (B) was in contra with findings by Cai (1998) who indicated that students preferred and perceived command Style (A) a reproduction style karate and racket classes.

However, student teachers too have high perceptions on using production cluster of style H (divergent production), style G (convergent discovery) and style F (guided discovery). This findings, line with findings by Morgan and Kingston (2009) using four initial teacher education revealed guided discovery style (F) resulted in more mastery, more adaptive cognitive and effective responses than practice. These findings is in line with current learning theory which prefer students construct their own learning via production cluster or by discovery learning (Cothran *et al.*, 2005; Shuell, 1996). The present findings revealed that, there is no significant differences between reproduction and production cluster of teaching styles in contras with findings by Cothran *et al.* (2005) indicated teachers perceptions and belief about different teaching styles varied. Whereas findngs from Korea and Portugal significantly use reproductive styles clusters most frequently such as style A (command) and style B (practice). On the other hand, contrast with countries such as England, Australia, and Canada used more production styles. This reserch findings also contradicted Byra (2006) findings which indicated direct teaching

styles or reproduction styles such as A, B, C, D and E remain as predominant styles in teaching physical education. However, findings of style B (practice style) which scored the highest ranking in perception perceived by the trainee teachers in this research is in line with findings of Byra (2006). Another finding from Cothran *et al.* (2005) indicated France using more productive styles after adopting new national physical education curriculum. France uses reproduction styles as well except the command style. Overall findings from Cohran *et al.* (2005) noted that reproduction styles are more commonly used worldwide in physical education than reproduction styles. Cothran *et al.* (2005) reported that U.S teachers prefer reproduction styles rather than production style due teachers lacking of experience, easier to control class. The findings of this research indicated there were no significant differences between reproduction and production cluster of teaching styles among students teacher in perception.

However, this research reveals that based on the mean score ranking, styles B, H, G, F, A and E are most perceived teaching styles by students teacher. This findings is parallel with experimental research findings too indicating style B, E and H showed significant improvements in skill execution in various sports and games such as shooting, karate, hockey and volleyball (Boyce, 1992; Golberger & Gerney 1986; Goldberger & Howarth, 1993; Harrison, Fellingham, Buck & Pellet, 1995). Findings too for inclusion style (style E), using college students indicated there was significant improvement in juggling skill in soccer.

On the other findings reported by Cothran *et al.* (2005), indicated England had the highest belief about five of the teaching styles (C, E, F, H, I) as well as the most experience with the five teaching styles (E, F, H, I, J). While Korea least experience with styles from B-H and France least experience for styles A, I-K. Based analysis of findings from Malaysia, England and France production style of F (guided discovery) and H (divergent production) seems to be fancied too among the respondents. Findings indicated there is no gender difference on perception of using different teaching styles except in convergent discovery style, where female trainee teachers in Malaysia have high significant perception compare to their male counterpart. Less clear why female student teacher in Malaysia significantly interested in convergent discovery style (G).

Conclusion

Practice style (style A), a teacher centered style, seems to be more fancied compared to other teaching styles by students teacher. However, more effort has to be done among student teachers in Malaysia, promoting multiple teaching style in teaching physical education. Advocating multiple teaching style can be the ingredients to develop more holistic pedagogical styles or forms of instructional model to match complex learning style of student teachers. Eventhough these designs have some shortcomings, the results of this preliminary study to understand sports science student teachers' use and perceptions about different teaching styles in Malaysia. It is our hope that this early research would make way for other researchers to investigate further about teaching styles, that can contribute in bilding up more holistic pedagogical style or instructional model

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