STUDENTS' EXPERIENCES WITH AND PERCEPTIONS OF TEACHING STYLES

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The cognitive diversity of students is well known. Less known, however, are strategies to meet the needs of those diverse learners. One potential tool for teachers is the use of different teaching styles. The purpose of this study was to investigate students' experiences with and perceptions of one of the teaching style frameworks, Mosston's Spectrum of Teaching Styles. A survey instrument was developed, validated by experts, and piloted. The final instrument included a short description of each of the 11 teaching styles and students provided information about their experiences with and perspectives on the fun, learning, and motivation benefits of each style. The survey was administered to 438 college students enrolled in elective physical education courses at a large university. Participants were asked to reflect on their K-12 physical education experiences while completing the survey. Students report more experiences with the reproductive styles and they differ in their perceptions of the value of different teaching styles. Different ratings were related to gender, type of learner, and course enrollment.

Educators increasingly are aware of the cognitive diversity of students in their classes. Students vary in learning style (Curry, 1999), intelligence (Gardner, 1983), and self-regulation (Zimmerman, 1990) to name but a few of the myriad of differences that affect how students learn. Increased knowledge about cognitive differences, however, does not translate directly into knowledge about how to teach those different learners. In fact, despite the boom in information about student differences, many classrooms continue to operate much as they have since the turn of the century. As Ennis (1989) noted, 'while we have payed lip service to differences among students, we continue to plan curriculum and instruction as though our learners represent one homogenous group" (p.1).

How can teachers meet the intellectual strengths and needs of so many different learners? One suggestion has been for teachers to use a variety of teaching styles to better match the variety of cognitive styles in their classes. Many different teaching styles have been proposed that range from a focus on a singular style such as cooperative learning (Johnson & Johnson, 1994; Slavin, 1990) to a wider range of options (Joyce & Weil, 1996).

One of more thoroughly developed models is Mosston's Spectrum of Teaching Styles which has been in continuous use and refinement for more than 25 years. The spectrum represents a continuum of decision making from teacher centered to student centered. The current version of the spectrum (Mosston & Ashworth, 1994) includes 11 different teaching styles: (a) command, (b) practice, (c) reciprocal, (d) self-check, (e) inclusion, (f) guided discovery, (g) convergent discovery, (h) divergent production, (i) learners' individual designed program, (j) learner initiated, and (k) self-teaching. (A short description of each style appears in Appendix A.) Style A, command, is the most teacher centered style as the teacher makes all decisions about the learning subject and tasks. As the spectrum moves toward Style K, learners are more involved in the decision-making process until finally the learner is making all decisions in Style K.

The styles also vary in their purpose and are frequently divided into clusters by their focus on the reproduction or production of knowledge. Styles A through E are referred to as the reproductive cluster and are aligned closely with the general premises of direct instruction. Within these styles, the teacher makes specific task decisions that allow the learner to gain and utilize knowledge and skills in ways designed by the teacher. The productive style cluster of styles F-K are indirect methods which require the learner to be involved in the processes of discovery and creative use of knowledge.

Although Mosston's Spectrum also was proposed as a teaching framework for general education (Mosston & Ashworth, 1985), it has been most influential in physical education where the spectrum of styles has been described as, Athe strongest influence on the way we conceptualize teaching in physical education today" (Metzler, 1983, p. 145). Despite its far-reaching influence on the theory and discussion of teaching in physical education, the use and effectiveness of the spectrum are relatively unknown. For example, Beckett (1990) found no difference in performance by ability level while Goldberger and Gerney (1986) found that average skilled children differed from exceptional children in their responses to different teaching styles. Different styles may (Boyce, 1992; Harrison, Fellingham, Buck, & Pellett, 1995) or may not (Goldberger, Gerney, & Chamberlain, 1982; Salter & Graham, 1985) affect psychomotor skill learning. A line of research suggests that different teaching styles may enhance different types of learning (Beckett, 1990; Cleland, 1994; Goldberger, Gerney, & Chamberlain, 1982).

One reason for the lack of clear research results on various teaching styles is the sheer size of the spectrum. With 11 styles as variables, a true experimental design directly comparing all styles in a counterbalanced manner is impossible to implement at a practical level. As a result, nearly all Mosston research involves the use of only 2-3 teaching styles and a relatively small sample of participants. Without comparing all styles across the same students, support for and generalizations about the spectrum cannot be made readily.

Another contributing factor to the relative lack of research support for the many teaching styles is researchers' failure to account for student perceptions of and reactions to various teaching styles. Although Mosston acknowledges a range of student decisions in the spectrum, student decisions are discussed as decisions that the teacher allows the student to make. Teachers are certainly a critical influence in class; however, they are not the only influence on the teaching-learning process.

Students are educational theorists too, actively interpreting and influencing the learning environment (Nicholls, 1992). This cognitive mediation paradigm (Doyle, 1977) recognizes that rather than being passive objects in class, students' perceptions of and reactions to the teachers' actions, not the teachers' actions alone, determine student engagement and learning. As a consequence of the different experiences, expectations, and needs each brings to class, students and teachers may not always assign the same meanings to the same events. Discrepancies between teachers' and students' perspectives related to the same teaching-learning experiences have been shown in classrooms (Cullingford, 1991; Farrell, Peguero, Lindsey, & White, 1988), as well as in physical education (Cothran & Ennis, 1997; Solmon et al., 1998). Students' perceptions of a teaching method may be particularly negative if the method is inconsistent with students' previous experiences with physical education (Cothran & Ennis, in press).

Despite the importance of understanding students' prior experiences and perspectives, educators know very little about the student experience in physical education. To examine student perspectives, researchers frequently rely on interviews with a relatively small number of students (e.g., Dyson, 1995; Hopple & Graham, 1995) or have students reflect on prior experiences and report their views at a later date than the original incident (e.g., Figley, 1985; Luke & Sinclair, 1991). As Lee (1997) noted, the use of student self-report is not without problems, however, "Students are aware of their thoughts and are able to report them with sufficient accuracy to yield information that researchers can use to explain how they learn from teaching" (p. 267).

In relation to Mosston's spectrum, almost no prior research has examined the student perspective on the different styles. Cai (1997) is the only researcher to examine student reactions to teaching styles as a primary research focus and found that college students' preference for command, inclusion, or reciprocal styles was influenced by the subject matter. Students in karate preferred command style while racquetball students more frequently favored the reciprocal style. Other researchers provide hints of similar attitude influence in their published results. Boyce (1992) found that even though the command style was superior for skill acquisition, more than 50% of the students reported not liking the learning environment.

Understanding the student perspective on Mosston's spectrum is significant for several reasons. First, with Mosston's central importance in physical education teaching literature, we must know more about its use and students' perceptions of the various teaching styles. As Metzler (1983) noted, "relying so heavily on the styles of the Spectrum in every aspect of our teaching without these answers makes the ground underneath our practices very shaky indeed" (p. 150). By understanding what styles are commonly used, educators can improve the design of teacher inservice development programs to promote more effective use of those styles,

or alternately to promote the use of different teaching styles. With increased understanding of students' perceptions, teachers may be better able to meet students' preferred learning styles as well as understand potential negative responses and resistance to a new style.

The purpose of this study was to examine students' experiences with and perceptions of Mosston's Spectrum of Teaching Styles. Specifically, the study sought to answer the following questions: (a) Have students experienced the full spectrum of teaching styles? (b) Do students differentiate among the educational characteristics (e.g., fun, learning, and motivation) of the teaching styles? (c) Are there student characteristics that influence their perception of different teaching styles?

METHOD

Instrument Development

A short, descriptive, scenario was written for each of the 11 teaching styles in the spectrum. These scenarios were based on the comprehensive overview of each style provided by Mosston and Ashworth (1994). A content validity test of the scenarios was performed with a panel of five physical education pedagogy experts. All five experts were familiar with the spectrum and have public school as well as college teaching experience. The panel received an instrument with the scenarios presented in random order. They also received a description of each of the 11 styles and were asked to match the scenario to a teaching style description. In addition, they were asked to provide comments regarding the appropriateness of the scenarios. There was 100% agreement among the panel that the scenarios reflected the teaching styles they were designed to represent.

The teaching style scenarios were then put in a survey instrument. On the instrument, each teaching scenario is followed by four statements: (a) "I had a physical education teacher that taught this way"; (b) "I think this way of teaching would make class fun"; (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." A 5-point scale was used for participant ratings. The first item ranged from "never" to "always." The remaining items were rated on a 5-point Likert-like scale from "strongly disagree" to "strongly agree." The instrument also had four demographic information questions related to the student's age, sex, ethnicity, and self-perceived learning ability in physical education.

A pilot test was conducted on the instrument with a group of students enrolled in a physical education class. Students were asked to complete the instrument, as well as circle any words on the instrument that were unknown or confusing. Students did not recommend any changes and reported no confusing terms. Since no changes were recommended by the panel of experts or the pilot group, a final version of the instrument was created. To account for potential order bias, three different versions of the instrument were prepared with the teaching styles randomly ordered in each version. The teaching style scenarios used in the instrument are provided in Appendix A.

Participants

The participants in this study were 438 college students enrolled in physical education elective courses at a large university. There were 219 males and 215 females. Students were recruited from three groups of classes. There were 152 participants from the individual and dual sports classes of racquetball, tennis, badminton, fencing, bowling, and billiards. The 136 team sports students were enrolled in volleyball and basketball courses. The third group, 147 fitness students, represented aerobics, weight lifting, yoga, and fitness conditioning courses. Participants who failed to complete the teaching scenario portion of the instrument were not included in the study. A small number of the participants failed to complete all of the demographic information requested on the form. Therefore, the actual number of participants for various aspects of this study ranged from 434-438. The sample was 82% European American, 6% African American, 2% Hispanic, and 10% Other, primarily Asian American. Ninety percent of the students were 17-22 years of age.

Data Collection

Student data were collected at the beginning of a regularly scheduled class period. A standard statement describing the study and asking for volunteers was read to each class by a researcher. The three versions of the instrument were randomly distributed to students who agreed to participate in the study. Both the written and oral instructions requested the participants to answer questions based on their memories of K-12, not college, physical education. Students provided consent and recorded their answers on standard scantron forms. The surveys were anonymous and took approximately 15 minutes to complete.

Data Analyses

Instrument. Tests were performed to determine if the teaching style's instrument could produce reliable and valid scores in this population. The reliabilities of the scores were estimated by assessing the internal consistency among items using Cronbach's alpha. Reliability coefficients were calculated for items related to students' perceptions of teaching styles (i.e., Items 2-4 for all teaching styles).

Construct validity of the scores produced by the instrument was measured using an exploratory factor analysis using varimax rotation. Items 2-4 (i.e., those related to students' perceptions of teaching styles) were used in the factor analyses based on findings from the reliability assessments showing that the items were strongly related. The exploratory factor analysis was used to determine if students' perceptions of all 11 teaching styles were independent or if perceptions of different styles would load on the same factor.

Based on the results of the first factor analysis (i.e., combining items related to perceptions for a given style created a reliable subscale), a secondary factor analysis was performed. This higher level of abstraction compared students' perceptions (the sums of Items 2-4 for each scale) and their experiences (Item 1) with the teaching styles in order to investigate the related aspects of students' experiences and perceptions. The concepts identified in the first factor analysis (i.e., perceptions) were used in the second factor analysis in an effort to identify underlying constructs in the data.

Experiences with teaching styles. A repeated measure ANOVA, with student response to Item 1 (I had a physical education teacher that taught this way) as the repeated measure, was used to determine if significant differences were present among students' experiences with different teaching styles. Contrast posthoc tests were used to investigate significant differences in experiences. Teaching styles were compared using the following pattern: (a) Style B to Style A, (b) Style C to all previous styles, and (c) Style D to all previous styles, etc.

To further investigate students' experiences with different teaching styles, a new variable was created by summing the number of teaching styles students indicated they had experienced. Descriptive statistics were then performed on the new variable "total style experience" which represented number of styles out of 11 that students had experienced.

Perceptions of teaching styles. Repeated measures ANOVAs were used to examine students' ratings of the fun, learning, and motivation aspects of the teaching styles, as well as their overall perceptions of the teaching styles. A new variable was created by totaling the responses to Items 2-4 -- justified by the results of the first factor analysis -- to investigate students' overall perceptions of the teaching styles. The first repeated measures ANOVA investigated students' rating of the fun expected from teaching styles, with Item 2 (I think this way of teaching would make class fun) as the repeated measure. Similarly, a repeated measure ANOVA with Item 3 (I think this way of teaching would help students learn skills and concepts), and then with Item 4 (I think this way of teaching would motivate students to learn), as the repeated measures, were performed to investigate students' perceptions of the learning and motivation aspects of the teaching styles. The fourth and final repeated measures ANOVA investigated the overall perceptions (combined scores of Items 2-4) of teaching styles. Multivariate analysis of variance (MANOVA) was used to test the hypotheses that student characteristics may influence their perceptions of different teaching styles. In order to look at the independent effects of sex, class, and learning ability on students perceptions, three separate MANOVA tests were performed. Bonferroni adjustments were used due to a possible inflation of the error rate related to the use of separate MANOVAs. The significance level was therefore set at .017 (Kirk, 1995). Significant MANOVAs were followed by discriminant analyses, ANOVA, and ANCOVA tests (Bray & Maxwell, 1982; Stevens, 1996).

Results

Instrument

Reliability assessments showed a high level of inter-item agreement among items related to students' perceptions (i.e., Items 2-4) for each style. The Cronbach alpha reliability coefficients for scores on the teaching styles ranged from .86 to .91.

The exploratory factor analysis extracted 11 factors with perfect correspondence to the 11 teaching styles. The eigenvalues for the 11 factors ranged from 7.11 to 1.05. Every teaching style was a factor identified in the factor analysis. The structure coefficients for the 11 factors ranged from .78 to .90. In addition, the majority of the fitted residuals (94%) were less than .05. All of the tests performed strongly support the 11 independent factors (i.e., perceptions of teaching styles) of the instrument. Students' perceptions of the teaching styles

created independent factors (refer to Table 1).

The secondary factor analysis, investigating the relationships between students' experiences and perceptions of teaching styles, identified six underlying constructs. In general, students' experiences and perceptions were separate constructs. Two of the factors were related to students' experiences with the teaching styles. Experience with seven of the teaching styles (J, I, K, H, E, D, C) created one factor. Three additional styles (B, A, F) comprised the second factor related to students' experiences. One separate item related to students' experiences, convergent discovery (G), was the only item to load on an experience and a perception factor, making it a common factor. Four factors also were identified related to students' perceptions of the teaching styles. First, perceptions of styles G, F, and H loaded on one factor. Second, perceptions about styles J, K, and I, loaded on a factor. Third, students' perceptions about styles C, B, and E created a factor. Lastly, perceptions of styles A and D created a factor. The factor loadings for the secondary factor analysis are available in Table 2.

Finally, related to the attitude instrument analyses, the self-perceived learning ability variable was modified based on a review of the frequency distribution. Very few participants rated themselves in the bottom two categories of below average or not good as a learner in physical education (n = 12). Therefore, the last three categories were combined. The self-perceived learning ability in physical education variable was revised to include three categories: (a) very good, (b) good, and (c) average-to-not-good.

Experiences with teaching styles. Results from the repeated measures ANOVA with Item 1 as the repeated measure showed that differences were present among students' experiences with teaching styles ($F(10, 416) = 89.28$, $p < .01$) (see Table 3 for descriptive statistics).

Table 1
Teaching Style Items and Confirmatory Factor Structure Coefficients

		Factors										
		1	2	3	4	5	6	7	8	9	10	11
Teaching Style	**Item**											
Self-check	D4	.90										
	D3	.87										
	D2	.84										
Learner's individual designed	I4		.89									
	I3		.89									
	I2		.87									
Convergent discovery	G4			.87								
	G3			.86								
	G2			.83								
Guided discovery	F4				.87							
	F3				.86							
	F2				.84							
Divergent production	H4					.87						
	H3					.85						
	H2					.82						
Practice	B4						.89					
	B3						.88					
	B2						.86					
Inclusion	E4							.90				
	E3							.89				
	E2							.83				
Reciprocal	C3								.87			
	C4								.86			
	C2								.83			
Self-teaching	K3									.88		
	K4									.86		
	K2									.78		
Command	A4										.89	
	A2										.85	
	A3										.85	
Learner initiated	J3											.86
	J4											.85
	J2											.78

Table 2
Teaching Style Items and Secondary Factor Structure Coefficients

		Factors					
		1	2	3	4	5	6
Teaching Style/Experience or Perceptions	**Item**						
Learner initiated (experience)	J1	**.74**					
Learner's induvidual designed (experience)	I1	**.71**					
Self -teaching (experience)	K1	**.67**					
Divergent production (experience)	H1	**.58**	.38				
Inclusion (experience)	E1	**.53**			.21	.26	.35
Self-check (experience)	D1	**.52**					.52
Reciprocal (experience)	C1	**.47**			.31	.36	-.20
Convergent discovery (perceptions)	G2-4		**.72**				.26
Guided discovery (perceptions)	F2-4		**.70**				
Divergent production (perceptions)	H2-4		**.69**		.37		
Convergent discovery (common factor)	G1	.41	.48			.31	
Learner initiated (perceptions)	J2-4			**.82**			
Self -teaching (Perceptions)	K2-4			**.72**			
Learner's individual designed (perceptions)	I 2-4			**.55**	.24	-.26	-.23
Reciprocal (perceptions)	C2-4				**.78**		
Practice (perceptions)	B2-4				**.63**	.21	
Inclusion (perceptions)	E2-4				**.61**		.38
Practice (experience)	B1					**.73**	
Command (experience)	A1					**.66**	
Guided discovery (experience)	F1	.40	.39			**.40**	
Command (perceptions)	A2-4				.36	.38	**.38**
Self-check (perceptions)	D2-4			.46			**.65**

Table 3
Means and Standard Deviations for Students' Ratings of Fun, Learning, Motivation and Overall Effictiveness

Experiences with teaching styles		**Overall perception of teaching styles** (average of Items 2-4)[1]		**Ratings for fun of teaching styles**		**Ratings for learning effectiveness of teaching styles**		**Ratings for motivation of teaching styles**	
Style (SD)	**Mean**	**Style**	**Mean (SD)**	**Style (SD)**	**Mean**	**Style**	**Mean (SD)**	**Style (SD)**	**Mean**
A	3.37 (1.09)	B	3.64 (0.91)	B	3.65 (0.98)	B	3.74 (0.96)	B	3.53 (1.10)
B	3.12 (1.15)	E	3.45 (0.95)	E	3.49 (1.02)	A	3.61 (1.04)	I	3.43 (1.17)
E	2.26 (1.20)	I	3.42 (0.99)	I	3.43 (1.11)	E	3.46 (1.02)	E	3.40 (1.13)
C	2.24 (1.17)	C	3.34 (0.92)	C	3.26 (1.04)	C	3.45 (1.01)	C	3.32 (1.03)
H	2.09 (1.11)	A	3.31 (0.91)	J	3.07 (1.13)	I	3.38 (1.03)	A	3.26 (1.06)
G	2.09 (1.10)	H	3.08 (0.97)	A	3.05 (0.99)	F	3.26 (1.08)	H	3.11 (1.08)
I	2.00 (1.17)	F	3.07 (0.96)	H	3.00 (1.07)	H	3.15 (1.03)	F	3.05 (1.07)
D	2.00 (1.12)	J	2.97 (1.02)	F	2.88 (1.00)	G	3.11 (1.08)	G	2.97 (1.11)
F	1.98 (1.09)	G	2.95 (1.01)	K	2.77 (1.25)	J	2.87 (1.13)	J	2.93 (1.19)
J	1.83 (1.11)	D	2.65 (1.06)	G	2.73 (1.11)	D	2.66 (1.14)	D	2.57 (1.52)
K	1.52 (0.96)	K	2.50 (1.09)	D	2.68 (1.15)	K	2.32 (1.14)	K	2.36 (1.23)

[1]Scaled for equivalence to other factors

All of the contrast posthoc tests were significant suggesting that differences were present among students' experiences with all of the teaching styles. Descriptive statistics on the new total number of styles experienced variable suggested that students had experienced multiple teaching styles in their physical education experiences. The mean number of teaching styles experienced by students was 5.44 ($SD = 2.26$).

Perceptions of teaching styles. Repeated measures ANOVA results suggested that students' ratings for fun, learning, and motivation differed by teaching style. The repeated measures ANOVA with fun (Item 2) as the repeated measure ($F(10, 418) = 37.65, p < .01$) suggested that differences were present in the way students viewed the potential fun of various teaching styles. Similarly significant differences were present in the repeated measures ANOVA with learning (Item 3) as the repeated measure ($F(10, 410) = 52.86, p < .01$) and the repeated measures ANOVA with motivation (Item 4) as the repeated measure ($F(10, 427) = 36.96, p < .01$). Finally, repeated measures ANOVA results with overall perceptions (combined Items 2-4) as the repeated measure ($F(10, 410) = 42.80, p < .01$) suggested that differences were present among students' overall perceptions of various teaching styles.

Results from three separate MANOVA revealed significant differences in students' perceptions between sexes, (Wilks lambda = .90, ($F(11, 405) = 4.20, p < .001$), classes (Wilks lambda = .89, ($F(22, 808) = 2.15, p < .002$), and learning ability (Wilks lambda = .91, ($F(22, 808) = 1.82, p = .012$). The first step of MANOVA follow-up for the observed differences between sexes was stepwise discriminant analysis. Results indicated that the learner's individual designed program (I) teaching style ($F(1, 415) = 18.16, p < .01$) was the variable that had the strongest influence on the differences in teaching style preferences between sexes, followed by Style H, divergent production ($F(2, 414) = 13.57, p < .01$), then Style K, self-teaching ($F(3, 413) = 12.09, p < .01$), and Style E, inclusion ($F(4, 412) = 10.33, p < .01$).

Follow-up univariate ANOVAs revealed significant differences between sexes for teaching Style I ($F(1, 428) = 20.00$, $p < .01$). Similarly, a follow-up ANCOVA for Style H, with Style I as a covariate, also indicated significant differences between sexes ($F(2, 426) = 18.72, p < .01$). In addition, a follow-up ANCOVA for Style K, with Styles I and H as covariates, ($F(3, 423) = 12.57, p < .01$) also was significant. Finally, a follow-up ANCOVA for Style E, with Styles I, H, and K as covariates also showed significant differences between sexes ($F(4, 420) = 9.16, p < .01$).

The discriminant analysis follow-up test for differences among students enrolled in fitness, individual/dual, and team sport classes, showed that Style H, divergent production ($F(2, 414) = 10.42, p < .01$), was the variable that had the strongest influence on the differences among classes, followed by Style D, the self check teaching style ($F(4, 826) = 7.08, p < .01$). A follow-up ANOVA for Style H investigating differences among classes showed that students enrolled in various classes indicated significantly different perceptions of this teaching style ($F(2, 431) = 10.29, p < .01$). Student-Newman-Keuls test results revealed that students enrolled in fitness classes had significantly different perceptions of this style than students in the individual/dual and team sport classes. An ANCOVA for Style D, with Style H as a covariate, also demonstrated significant differences among classes ($F(3, 428) = 10.15, p < .01$). Similar findings from the Student-Newman-Keuls tests showed that students enrolled in fitness classes varied in their perceptions of this teaching style from students in the individual/dual and team sports classes.

Finally, the follow-up test (discriminant analysis) performed to investigate differences among learning ability groups indicated that Style A, command ($F(2, 414) = 5.84, p < .01$) was the variable with the most significant influence on the observed differences among learning ability groups, followed by Style D, self-check ($F(4, 826) = 4.63, p < .01$). A follow-up ANOVA showed significant differences in students' perceptions of Style A (command) by learning ability group ($F(2, 431) = 5.04, p < .01$). Students who believed their learning ability in physical education were "very good" indicated significantly higher perceptions of this teaching style than all other types of learners. A follow-up ANCOVA performed for Style D, with Style A as a covariate, also showed significant differences among learning ability groups ($F(3, 428) = 4.83, p < .01$). For the self-check teaching style, however, the Student-Newman-Keuls test results showed the high ability group students had significantly lower perceptions than the low ability group, with the middle group (i.e., self-rated good learners) between the other two groups.

Discussion

Mosston's Spectrum of Teaching Styles has influenced research and teacher practice in physical education for more than 25 years. Despite its important role, the spectrum's use in actual practice as well as student

perspectives on the spectrum have not been topics of prior research. These findings offer initial insights into those two critical areas.

Teachers seem to be using different styles as the average student reports experience with slightly more than 5 of the possible 11 styles. The reproductive styles (A-E) dominate despite the fact that current learning theory is based on the idea that learning is not reproductive, but rather is constructive (Shuell, 1996).

In addition to providing insights into the relative use of the various teaching styles, these results support the cognitive mediation paradigm and Nicholl's (1992) contention that students are educational theorists too. Students clearly and consistently reported an understanding of differences between and benefits of different styles. In general, students support educators' contention of the value of different teaching styles. All styles were rated as having some positive level of educational influence, although the productive cluster styles were not viewed as positively as the reproductive cluster at promoting fun, learning, and motivation. Students also seem to support Mosston and Ashworth's (1994) suggestion that different styles may accomplish different outcomes as they clearly distinguished among the learning, motivation, and fun potential of the styles.

Less clear is why students found the productive cluster less desirable in promoting educational outcomes. Certainly one contributing reason is familiarity. There was a small, but significant correlation between experience and ratings. Since students have had more experience with the reproductive styles, it is possible they view them more positively. In this case, familiarity may breed comfort rather than contempt. Students are actually a very conservative classroom force (Fullan, 1991) and the productive cluster teaching styles may have violated students' expectations for physical education and were therefore rated lower. Although significant, the experience-ratings correlations were not exceptionally high which suggests that there are other factor(s) involved in student ratings.

There were two exceptions to the cluster rule that provide us with additional insight into students' perspectives on the spectrum. Styles D, self-check, and I, learners' individual designed program, did not follow the general pattern for their clusters. Style D, although a member of the generally well received reproductive clusters, was consistently rated lower by students than the other reproductive styles. Conversely, Style I received more favorable ratings than its theoretical mates in the productive cluster. Students reported little experience with either.

One possible explanation is the importance of social interaction to students. The self-check style, Style D, differs from the other reproductive styles because it allows for little social interaction. Previous research (Allen, 1986; Cothran & Ennis, 1998) indicates social concerns drive the student value system. Yet social interaction cannot be the only factor in student rankings because the learner's individual designed program, Style I, does not provide for strong social interaction, yet students perceived it favorably. What appears to make Style I unique in the productive cluster is that it provides for student choice in a structured setting. Students reported that they most frequently experienced the reproductive styles, styles that rely on teacher decision making as the major influence. Perhaps Style I was attractive because it provided students with choice without giving them near total freedom as would be true in Styles J and K. The two exceptions to the cluster rules suggest that students prefer the teaching styles that allow for social interaction, and choice with teacher guidance.

Regardless of the cluster trends and exceptions, a closer examination of students' highest and lowest overall perceptions of styles supports the importance of social interaction and choice with teacher guidance. Styles B, practice; Style E, inclusion; and Style I, learners' individual designed program, received the highest overall rating by students and all three offer students social interactions, and/or choice with teacher guidance. On the opposite end of the spectrum is the lower-rated Style D, self-check, Style G, convergent discovery, and Style K, self-teaching. All three teaching styles suggest the ability to self-direct learning, an idea which is foreign to many students. In addition, Styles D and K are missing social interaction.

Interestingly, student perception trends varied with the individual characteristics of students. Self-rated ability, course enrollment, and sex all influenced student perception of the various styles. Self-rated learning ability was most influential on participants' rating of Styles D and A. Although Style D was lower ranked by the entire population, those students that considered themselves average-to-not-so-good ability in physical education perceived the style more favorably. The high ability group held higher perceptions of the benefits of Style A.

Additionally, student characteristics of course enrollment and sex influenced student perspectives on the various teaching styles. Students in fitness courses perceived greater benefit for teaching Style D, self-check, and Style H, divergent production. Perhaps students attracted to elective fitness courses value more inde-

pendent or multiple approaches than do their counterparts in sport-based courses. Related to the course differences are sex differences. Female students reported significantly higher ratings for Styles H, E, and I. Sex differences in student perceptions of Mosston's styles are previously unreported in the spectrum research literature. Differences between sexes could be related to more favorable attitudes toward independent participation in physical activities or having the opportunity to make more decisions in physical education classes. Female students may also feel less threatened by working independently to discover multiple responses to a question (Style H) or to design their own program (Style I), and selecting a level of tasks that they can perform (Style E). The observed course and sex differences are complex and perhaps interrelated as course enrollment patterns had a sex bias. There were only 25 males in the fitness group compared to 121 females.

The results of this study indicate that Mosston's Spectrum of Teaching Styles has moved beyond discourse to influence teaching practice. It is also clear that the "journey" from theory to practice is unfinished. The relative lack of use and student value for the productive cluster needs to be explored by further research. Possible influences may be teacher comfort with and knowledge of Styles F-K, physical education goals, or the limited time available with students. Additionally, the relationship between experience and perceived value of teaching styles is intriguing, but unclear and worthy of future exploration.

Students' insights into the spectrum of styles suggest that they may be an untapped resource that can aid educators' understanding of classroom processes. As Cullingford (1991) noted, "Their views deserve to be taken into account because they [students] know better than anyone, which teaching styles are successful, which techniques of learning bring out the best of them . . ." (p. 2). To create a positive learning environment for all students, teachers may choose to match their instruction to students' preferred teaching styles such as Styles B, E, and I. Alternatively, teachers also may choose to help students explore new ways of learning. In particular, promoting self-guided learning would seem to be compatible with current program goals of lifetime involvement in movement. To use the productive styles, however suggests that teachers must recognize that students may initially greet such change with doubts and a lack of needed skills. For example, initial attempts at a productive style as well as Style D might not be viewed positively. Teachers should help students develop independent learning skills with well-defined steps and a developmental transition to self guided learning. With an increased understanding of students' perceptions of the positive or negative contributions of teaching styles, teachers are better prepared to provide appropriate and effective instructional techniques for all students resulting in the potential for increased student learning.

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