Approaches and Thinking Styles in Teaching

LI-FANG ZHANG
Department of Education
The University of Hong Kong

ABSTRACT. In this study, the author examined the relationship between teaching approaches and thinking styles in teaching. The study parallels previous investigations (Zhang, 2000a, 2000b; Zhang & Sternberg, 2000) of students' learning approaches and thinking styles in learning. Seventy-six in-service teachers from Hong Kong responded to the Approaches to Teaching Inventory (K. Trigwell & M. Prosser, 1996) and the Thinking Styles Inventory in Teaching (E. L. Grigorenko & R. J. Sternberg, 1993) as well as to a range of questions designed to assess the participants' perceptions about their work environment. It was concluded that approach and style are two overlapping constructs with different labels. The differences between approach and style are in degree, but not in kind.

Key words: teaching approaches, teaching styles, thinking styles

BETWEEN THE LATE 1950s AND EARLY 1970s, many theories and models of styles were postulated. However, the seemingly permanent wave of research and theorization of styles subsided partially because of the overwhelming output from the field and partially because of a lack of internal dialogue (Jones, 1997). According to Riding and Cheema (1991), many scholars working within the "styles" paradigm did not acknowledge the existence of other types of styles. Indeed, by the year 1991, Riding and Cheema had identified 30 "style" labels in the literature. Therefore, we are left with a research field that encompasses a variety of different, and yet similar, constructs.

Over the last 10 years or so, two types of efforts have been made to clarify the relationships among the different labels for the style construct. One is through conceptual integration. The other is through empirical research.

The most recent effort in conceptual integration is represented by Sternberg's (1997) conceptualization of three approaches (or traditions) to the study of styles:

cognition centered, personality centered, and activity centered. Styles in the cognition-centered approach most closely resemble abilities. In addition, like abilities, these styles have often been measured by tests of maximal performance with "right" and "wrong" answers (e.g., Kagan, 1976; Witkin, 1964). The personality-centered approach views styles as closer to personality traits. Furthermore, styles in this tradition are measured with typical-performance rather than maximum-performance tests (e.g., Gregorc, 1979; Myers & McCaulley, 1988). The activity-centered approach emphasizes the notion of styles as mediators of various forms of activities that tend to arise from aspects of cognition and personality (e.g., Biggs, 1979; Entwistle, 1981; Marton, 1976).

Empirical research with the aim of clarifying the relationships among styles has been limited (Fine, 1991; Marton, 1999, personal communication). Especially meager are studies that are based on theories from across two different approaches to the study of styles as conceptualized by Sternberg. A thorough literature review revealed only four such studies.

Beishuizen, Stoutjesdijk, and Van-Putten (1994) studied the relation between cognitive levels of task accomplishment (cognition centered) and deep versus surface processing of learning material (activity centered). They found that students who processed at a surface level tended to benefit from cognitive support. Students who combined self-regulation with deep processing and students who combined external regulation with surface processing outperformed students who showed the opposite pairings of type of regulation with type of processing.

Ford (1995) tested 38 university students for field dependence–independence using Riding's (1991) compter-administered Cognitive Styles Analysis (CSA; cognition centered). Students were also taught the computerized version of Pask and Scott's (1972) original testing materials designed to suit holist and serialist learning strategies (activity centered). A computerized test was used for assessing learning performance. Results indicated that students' holist and serialist competence could be predicted by their scores on the CSA.

Sadler-Smith (1997) conducted a more comprehensive study of the relationships among the style labels by including four instruments—three activity centered and one cognition centered. Two hundred forty-five university undergraduates responded to the CSA (Riding, 1991), the Learning Preferences Inventory (Riechmann & Grasha, 1974), the Learning Styles Questionnaire (Honey & Mumford, 1992), and the Revised Approaches to Studying Inventory (Entwistle & Tait, 1994). No statistically significant relationships were identified between cognitive styles and any of the other style constructs investigated.

In a more recent study of 130 university students, Sadler-Smith (1999) examined the relationships between cognitive styles as measured by the Cognitive Style Index (Allinson & Hayes, 1996) and learning approaches as measured by the Approaches to Studying Inventory (Gibbs, Habeshaw, & Habeshaw, 1988). Although results indicated that analysts tended to adopt a deeper approach to learning than did the intuitives and that intuitives exhibited a stronger prefer-

ence for collaborative approaches than did the analysts, Sadler-Smith concluded that the evidence found in the relationships between cognitive styles and learning approaches was not strong and that "style and approach are superficially at least, independent" (p. 170).

Most recently, we (Zhang, 2000a; Zhang & Sternberg, 2000) carried out two studies involving two theories that have more implications for teaching–learning processes. One is Biggs's (1979) theory of student learning approaches. The other is Sternberg's (1988) theory of mental self-government.

Biggs (1979) proposed three learning approaches. The first is a surface approach. Students who adopt this learning approach have a motive for obtaining a degree and use a learning strategy that allows them to do the minimum to get by. The second is a deep approach. Students who adopt this approach have an intrinsic motive for learning and use a learning strategy that allows them to achieve a true understanding of the material learned. The third is an achieving approach. Students who adopt this learning approach have a motive for academically surpassing their peers and use a learning strategy that helps them to maximize their academic achievement.

The Study Process Questionnaire (SPQ; Biggs, 1987, 1992) is designed to assess university students' learning approaches. Good reliability and validity data have been obtained with this instrument among the majority of populations tested around the world. However, it should be noted that whereas some research results have supported the SPQ's assessment of three approaches to learning (e.g., Bolen, Wurm, & Hall, 1994), other results have supported a two-factor (surface and deep) model (e.g., Niles, 1995; Watkins & Dahlin, 1997). The two-factor model is consistent with the model proposed by Marton (1976), who used a phenomenographic method in studying students' learning approaches. Furthermore, research on students' learning approaches based on Biggs's theory have also generated valuable implications for teaching and learning (e.g., Sadler-Smith & Tsang, 1998; Watkins, 1998; Zhang, 2000b).

The theory of mental self-government (Sternberg, 1988, 1990, 1997) concerns thinking styles that apply to different types of activities, including teaching and learning. Central to this theory is the notion that people need, somehow, to govern or manage their everyday activities. People choose styles of managing these activities with which they feel comfortable. Moreover, thinking styles are at least in part socialized (Sternberg, 1994, 1997). The theory describes 13 thinking styles that fall along five dimensions of mental self-government: (a) functions (including the legislative, executive, and judicial styles), (b) forms (including the hierarchical, oligarchic, monarchic, and anarchic styles), (c) levels (including the global and local styles), (d) scopes (including the internal and external styles), and (e) leanings (including the liberal and conservative styles). A brief description of each of the 13 thinking styles can be found in the Appendix (for details, see Sternberg, 1997).

The theory of mental self-government has been operationalized through sev-

eral inventories, including the Thinking Styles Inventory (TSI; Sternberg & Wagner, 1992) and the Thinking Styles in Teaching Inventory (TSTI; Grigorenko & Sternberg, 1993). Both inventories have been tested in cross-cultural contexts, including Hong Kong, mainland China, and the United States. Results indicated that both inventories have reasonably good reliability and validity (Zhang, 2000a; Zhang & Sternberg, 2001). The two inventories also have been assessed for their heuristic and predictive value in educational settings (Zhang, 1999; Zhang & Sachs, 1997; Zhang & Sternberg, 1998).

Given that both learning approaches and thinking styles have heuristic and predictive value in educational settings and that both terms have a style label (Sternberg, 1997), we (Zhang, 2000a; Zhang & Sternberg, 2000) examined the relationship between learning approaches and thinking styles. In Zhang and Sternberg (2000), we investigated this relationship among two Chinese samples of university students, one from mainland China ($N = 215$) and the other from Hong Kong ($N = 854$). We found that the scales in the SPQ and those in the TSI are generally related in predicted ways. Students who reported taking a surface approach to learning preferred using the executive, local, and conservative styles (which are more traditional, norm favoring, and task oriented), whereas students who reported taking a deep approach to learning preferred using the legislative, judicial, and liberal thinking styles (which are more creativity generating, norm questioning, and meaning seeking).

Zhang (2000a) investigated the relationship between the SPQ and the TSI among two U.S. university student samples ($N = 67$, $N = 65$). In this study I also examined the relationship of each of the two inventories to a range of student characteristics that indicate student involvement. The results confirmed those found in Zhang and Sternberg (2000). Moreover, the results of the second study suggested that more student involvement is related to the deep approach to learning and to thinking styles that are creativity generating.

In the present study, I have further examined the relationship between styles and approaches by investigating the parallel situation for teachers. As discussed earlier, Sternberg's theory of thinking styles applies to a variety of populations, including teachers. Furthermore, the TSTI assesses thinking styles in teaching. This inventory is restricted to measuring three of the five dimensions of thinking styles (function, level, and leaning). The seven thinking styles included are the legislative, executive, judicial, global, local, liberal, and conservative.

Trigwell, Prosser, and Taylor (1994; also Prosser & Trigwell, 1999), in their investigation of approaches to teaching of 1st-year university science teachers, have found parallels with students' approaches to learning. They proposed that there are two approaches to teaching. One is information transmission/teacher focused. Teachers adopting this approach tend to be content oriented and to emphasize the reproduction of correct information. The other teaching approach is conceptual change/student focused. Teachers adopting this approach are learning oriented and concerned with students' conceptual change.

My first prediction was based on the nature of the two theories as well as on the results from our previous research on the relationship between students' thinking styles in learning and their learning approaches. Teachers who report taking a student-focused approach to teaching will score significantly higher on scales related to the legislative, judicial, global, and liberal thinking styles, whereas teachers who report taking a teacher-focused approach will score significantly higher on scales related to the executive, local, and conservative thinking styles.

Furthermore, I also examined the relationships of each of the two inventories to a third variable. I chose teachers' perceptions about their work environment as the variable because research indicates that teachers' perceptions about their work environment affect their teaching approaches (Prosser & Trigwell, 1997). Also, because thinking styles are in part socialized (Sternberg, 1997), significant relationships between thinking styles in teaching and teachers' perceptions of their work environment were anticipated. I predicted that teachers whose perceptions about their work environment are positive will report a student-focused teaching approach and will use more sophisticated and creativity-generating thinking styles (e.g., legislative, judicial, global, and liberal). Teachers whose perceptions about their work environment are negative will report a teacher-focused teaching approach and will use more simplistic and norm-favoring thinking styles.

Method

Participants

Data were collected from 76 (26 men and 50 women) in-service teachers (i.e., certified teachers who do not yet have a degree but who are working toward a degree while they teach) from the Faculty of Education of The University of Hong Kong. Among them, 67 were enrolled in the Bachelor of Education program and 9 in the Master of Education program. Their ages ranged from 26 to 46, with a mean age of 31 and a median of 29 years. The length of their teaching experience ranged from 3 years to 21 years, with a mean of 8 years and a median of 6 years.

Measures

I administered the Approaches to Teaching Inventory (ATI; Trigwell & Prosser, 1996) and the Thinking Styles in Teaching Inventory (TSTI; Grigorenko & Sternberg, 1993) in Chinese translations. In addition, teachers responded to four questions and one statement that I designed to assess their perceptions about their work environment.

The ATI is a self-report test consisting of 16 items. The 16 items fall into 2

scales (with 8 items in each): Conceptual Change/Student-Focused and Information Transmission/Teacher-Focused. Each scale is further divided into 2 subscales, one containing 4 intention items, the other containing 4 strategy items. Thus, the 4 subscales are Conceptual Change/Student-Focused/Intention, Conceptual Change/Student-Focused/Strategy, Information Transmission/Teacher-Focused/Intention, and Information Transmission/Teacher-Focused/Strategy. The respondents are instructed to rate themselves on a 5-point Likert-type scale ranging from *only rarely true for me* (1) to *almost always true for me* (5). Examples of the items in the inventory are "I feel a lot of teaching time should be used to question students' ideas" (Student-Focused/Intention) and "In a subject, I concentrate on covering the information that might be available from a good textbook" (Teacher-Focused/Strategy).

The TSTI is a 49-item self-report questionnaire in which respondents are instructed to rate themselves on a 7-point Likert-type scale ranging from *does not describe me at all* (1) to *describes me extremely well* (7). The inventory was designed to assess the seven thinking styles as manifested in teaching: legislative, executive, judicial, global, local, liberal, and conservative. Each 7 items constitute one scale that assesses one thinking style. Examples of items in the inventory are "I like students to plan an investigation of a topic that they believe is important" (Legislative), "I like to give my students tests that require exacting and highly detailed work" (Local), and "Each year I like to select new and original materials to teach my subject" (Liberal).

The participants' perceptions about their work environment were obtained through their responses to four questions rated on a 4-point scale and one statement rated on a 5-point scale. The first three questions were related to the participants' own situations. The first assessed teachers' feeling of the degree of adequacy about the training they received for their role as teachers. The second assessed their degree of satisfaction with their own salary. The third assessed their perceived possibility of getting a salary increase. The fourth question elicited teachers' perceptions about the quality of their students. Item 5, the statement on which teachers rated themselves, assessed the extent to which teachers think they have control over the subject content they teach.

Data Analysis

I used Cronbach's alpha to estimate the internal consistency of each of the measures in the two inventories. I conducted a principal-axis factor analysis with an oblique rotation procedure to examine the validity of each of the two inventories. The relationships between the two inventories were first explored by computing a zero-order correlation matrix followed by a principal-axis factor analysis. Finally, I performed stepwise multiple-regression analysis to explore the relationships of the participants' perceptions of their work environment to their thinking styles in teaching and to their approaches to teaching.

Results

Subscale Reliability

The alpha coefficients for the four ATI subscales were .53 (Student-Focused/Intention), .54 (Student-Focused/Strategy), .63 (Teacher-Focused/Intention), and .50 (Teacher-Focused/Strategy). These alpha coefficients were similar in magnitude to those reported in Trigwell and Prosser's (1996) study in which 22 items were used representing 5 subscales (the Student–Teacher Interaction Strategy subscale was the 5th). Given that there are only 4 items in each subscale and that I was testing the Chinese version of the ATI for the first time, I concluded that the alpha coefficients were sufficient to allow the remaining analyses.

The alpha coefficients of internal consistency for the seven thinking styles of the ATI were .71 (legislative), .81 (executive), .63 (judicial), .61 (global), .77 (local), .66 (liberal), and .69 (conservative). These alpha coefficients were similar in magnitude to those reported both in Sternberg and Grigorenko's (1995) study and in Zhang and Sternberg's (in press) study of Hong Kong secondary school teachers.

Factor Analysis: ATI and TSTI Analyzed Separately

A clear two-factor solution resulted from the factor analysis of the ATI. A first factor had high loadings (.91 for both) on the two teacher-focused subscales. A second factor had high loadings (.88 for both) on the two student-focused subscales. The two factors accounted for 80% of the variance in the data.

A distinct two-factor solution was also obtained from the analysis of the factorial structure of the TSTI. The first factor loaded on the judicial (factor loading .89), liberal (.86), legislative (.80), and global (.75) thinking styles (more sophisticated and creativity generating). The second factor loaded on the executive (factor loading .93), conservative (.89), and local (.85) thinking styles (more simplistic and norm-favoring). The two factors accounted for 73% of the variance in the data.

The correlation coefficients between the ATI and the TSTI are given in Table 1. Conceptually, the student-focused subscales should be significantly and positively correlated with the more sophisticated and creativity-generating thinking styles scales but significantly and negatively correlated with the more simplistic and norm-favoring scales.

By contrast, the teacher-focused subscales should be significantly and positively correlated with the more simplistic and norm-favoring thinking styles scales but significantly and negatively correlated with the more sophisticated and creativity-generating thinking styles scales. All but one correlation coefficient were in the expected directions (student-focused strategy and the local style were positively related, but nonsignificantly). The majority of these expected correlation coefficients were statistically significant.

TABLE 1
Pearson Correlation Matrix for the Approaches to Teaching Inventory (ATI) and Thinking Styles in Teaching Inventory (TSTI) Measures

Measure	ATI			
	CCSFI	CCSFS	ITTFI	ITTFS
TSTI				
Legislative	.36**	.34**	−.19	−.25*
Executive	−.24*	−.06	.60**	.49**
Judicial	.36**	.35**	−.14	−.24*
Global	.18	.22	−.02	−.18
Local	−.07	.16	.61**	.48**
Liberal	.35**	.48**	−.20	−.30**
Conservative	−.21	−.13	.61**	.54**

Note. N = 76. CCSFI = Conceptual Change/Student-Focused/Intention; CCSFS = Conceptual Change/Student-Focused/Strategy; ITTFI = Information Transmission/Teacher-Focused/Intention; ITTFS = Information Transmission/Teacher-Focused/Strategy.
*p < .01 (two-tailed). **p < .05 (two-tailed).

Factor Analysis: ATI and TSTI Analyzed Together

The factor analysis involving the measures from both inventories resulted in a two-factor solution. Each factor was loaded by measures that were expected to be positively correlated. The first factor was loaded by the executive, local, and conservative thinking styles and by the two teacher-focused subscales. The second factor was loaded by the legislative, judicial, global, and liberal thinking styles and by the two student-focused subscales. Detailed results from this analysis are given in Table 2.

Teaching Approaches, Thinking Styles in Teaching, and Perceptions

Results from the stepwise multiple-regression analysis lent partial support to the prediction regarding the relationships of teachers' perceptions of their work environment to their thinking styles and teaching approaches. The following significant and positive relationships were identified: (a) being allowed to determine one's own teaching subject content with the legislative style, (b) belief in the adequacy of one's training for one's role as a teacher with the judicial and liberal styles and the student-focused intention teaching approach, (c) satisfaction with one's salary with the judicial and global thinking styles, and (d) belief in one's prospect for a salary increase with the executive and the conservative thinking styles.

However, I did not identify any significant and negative relationship as predicted. Table 3 contains the summary data from these analyses. The table pro-

TABLE 2
**Factor Loadings Jointly for the Approaches to Teaching Inventory (ATI)
and the Thinking Styles in Teaching Inventory (TSTI)**

Measure	Factor 1	Factor 2
TSTI		
Legislative		.76
Executive	.88	
Judicial		.85
Global		.69
Local	.84	
Liberal		.86
Conservative	.86	
ATI		
Student-Focused/Intention		.57
Student-Focused/Strategy		.64
Teacher-Focused/Intention	.83	
Teacher-Focused/Strategy	.72	
% variance	34.13	27.51
Cumulative variance	34.13	61.64
Eigenvalues	3.75	3.03

Note. $N = 76$. Factor loadings below $|.30|$ have been omitted.

vides the variance in teachers' thinking styles and approaches to teaching accounted for by teachers' perceptions, with specific aspects noted in the subscript. For example, $.07_{Content}$ (which is at the cross point of R^2_1 and the legislative thinking style) indicates that 7% of the variance in the legislative thinking style in teaching can be accounted for by teachers' perceptions that they have control over what they teach. Table 3 also provides the beta weights of a regression as well as the F value and degrees of freedom in the analysis of variance for each final model.

Discussion

The major objective of this study was to examine the relationship between teaching approaches and thinking styles in teaching. I investigated two predictions. First, teaching approaches and thinking styles in teaching should be related in predictable ways. Second, teachers' perceptions of their work environment should be related to both thinking styles and teaching approaches. I tested the two predictions with two inventories that have shown good reliability and validity and with teachers' responses to four questions and one statement designed to assess their perceptions about their work environment.

TABLE 3
Study 2: Possible Range, Mean, Standard Deviation, and Internal Consistency
Values for All Variables in the Corporate Sample ($N = 160$)

Variable	Possible range of scores	M	SD	α
Self–leadership	16–80	62.1	9.3	.90
Health outcomes				
Perceived wellness	3–29	16.5	3.2	.89
Work stress	7–35	24.1	5.0	.88
Work outcomes				
Work satisfaction	4–20	15.1	2.8	.73
Organizational communication	4–20	12.0	2.7	.67
Quality management	6–30	21.5	4.3	.79
Relationship to leader	5–25	19.4	4.3	.90
Team culture	4–20	13.2	2.9	.80

Results from both the zero-order correlation analysis and the factorial structural analysis fully supported my prediction of the relationship between the two constructs. The results make substantive sense. Both theories illustrate manners in which teaching tasks are perceived and performed. For example, a teacher who intends to facilitate students' conceptual change would inevitably use his or her teaching abilities in a more creative and nontraditional way, and a teacher who prefers to teach creatively and in a nontraditional way would facilitate students' conceptual change, which is a result of a student-focused teaching approach (also see Sadler-Smith, 1996). Therefore, thinking styles in teaching and approaches to teaching appear to have an overlapping conceptual role.

More specifically, a student-focused/conceptual change approach to teaching should manifest itself in at least several ways. First, teachers provide students with intellectual autonomy and chances to make their own decisions. Second, teachers create a learning atmosphere in which students are allowed to evaluate different viewpoints. Also, teachers encourage students to focus on bigger pictures of the issues encountered in students' learning tasks. Teachers who tend to practice this kind of teaching are actually using the legislative, judicial, global, and liberal thinking styles in their teaching.

Teachers who adopt the teacher-focused/information transmission teaching approach would inevitably be engaged in such teaching activities as lecturing about facts and requiring students to reproduce what they have learned in detail. Teachers who tend to practice this kind of teaching are, in fact, using the executive, local, and conservative thinking styles. Therefore, the factorial structure across the two inventories makes substantive sense.

The present finding regarding the relationship between thinking styles in teaching and teaching approaches supported previous findings regarding a parallel relationship identified in student learning (Zhang, 2000a; Zhang & Sternberg, 2000). In these studies, Sternberg amd I used inventories derived from almost identical theoretical frameworks, as mentioned earlier. We found that students who reported a deep approach to learning tended to use more complex and creativity-generating thinking styles. Students who reported a surface approach to learning tended to use more simplistic and norm-favoring thinking styles. Moreover, the present study results lend support to research conducted by other scholars whose aim has been to clarify the relationship between the style construct and the approach construct (e.g., Beishuizen et al., 1994; Ford, 1995).

To further examine the nature of the two constructs, I introduced a third variable, teachers' perceptions about their work environment. According to Prosser and Trigwell (1999), only one study exists that examined the relationship between teachers' perceptions of their work environment and teaching approaches (Prosser & Trigwell, 1997), although there has been an argument that teaching approaches are context dependent. No empirical research has been conducted to study the relationship between teachers' perceptions of their work environment and thinking styles in teaching. However, because thinking styles are at least partially socialized (Sternberg, 1997), I predicted that thinking styles in teaching also should be related to teachers' perceptions of their work environment, that is, that thinking styles in teaching are context dependent.

Again, this prediction was partially supported by my results in this study. Some significant relationships were identified between teachers' perceptions of their work environment and particular thinking styles. First, having a sense of control over what one teaches had a significant positive relationship with the use of the legislative thinking style. There are two interpretations of this finding. One interpretation is that teachers with a sense of control over what they teach become more legislative in their teaching. The other interpretation is that teachers using a legislative thinking style tend to think that they have more control over what they teach.

Second, believing in the adequacy of the training one received for the role of teacher had a significantly positive relationship with both the judicial and liberal thinking styles. Again, there are two plausible interpretations of these results. One is that if teachers feel that they received good training for their role as teachers, they would feel confident about themselves. When they are confident about themselves as teachers, they would naturally be more comfortable evaluating and making judgments about different situations (the judicial style) and with teaching in a more norm-challenging way (the liberal style). The other interpretation is that teachers who prefer to evaluate and make judgments about different situations and who teach in a nontraditional way become more confident in their role as teachers. Either way, a teacher's confidence is associated with evaluative and liberal thinking styles.

A significantly positive relationship was also found between one's belief about the adequacy of teacher training and the use of the student-focused teaching approach (intention). It is possible that teachers who have enough self-confidence about the training they received for their role as teachers tend to be more willing to allow their students to construct their own knowledge (conceptual change) rather than to be dominant about what and how students learn.

Furthermore, teachers' satisfaction with their salaries was significantly and positively correlated with the use of judicial and global thinking styles in teaching. No definite explanation can be made for this finding. However, satisfaction with one's salary is one of the many manifestations of satisfaction with one's job. It is possible that job satisfaction is related to the use of the more complex thinking styles, such as the judicial and global styles.

Finally, I found that teachers who were more optimistic about their prospect for a salary increase tended to use executive and conservative thinking styles in their teaching. A possible reason for this result is that a salary increase for teachers might depend heavily on the evaluations of their teaching by people who supervise them. When teachers are being evaluated, they tend to perform their tasks according to instructions (executive thinking style) and they tend to go by rules and procedures (conservative thinking style).

Conclusions

The results of the present study make two contributions. First, I have further verified the relationship between the approach and the style constructs. In addition to results of previous studies of the relationship of learning approaches and thinking styles in learning, I found a parallel relationship between teaching approaches and thinking styles in teaching. Second, the present study results indicate that both teaching approaches and thinking styles are context dependent.

Based on findings among teachers in the present study and previous findings among students (Zhang, 2000a; Zhang & Sternberg, 2000), I have drawn a preliminary conclusion that approach and style are two overlapping constructs with different labels. The differences between approaches and styles are in degree, but not in kind. Nevertheless, the present study is the first conducted among teachers. Therefore, it should be considered an exploratory study.

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APPENDIX
Sample Items From the Thinking Styles Inventory

Sample items	Scale type	Key characteristic
• I like tasks that allow me to do things my own way.	Legislative	Being creative
• I like situations in which it is clear what role I must play or in what way I should participate.	Executive	Being conforming
• I like to evaluate and compare different points of view on issues that interest me.	Judicial	Being analytical
• I like to complete what I am doing before starting something else.	Monarchic	Dealing with one task at a time
• When undertaking some task, I like first to come up with a list of things that the task will require me to do and to assign an order of priority to the items on the list.	Hierarchic	Dealing with multiple prioritized tasks
• I usually know what things need to be done, but I sometimes have trouble deciding in what order to do them.	Oligarchic	Dealing with multiple non-prioritized tasks
• When working on a written project, I usually let my mind wander and my pen follow up on whatever thoughts cross my mind.	Anarchic	Dealing with tasks at random
• Usually when I make a decision, I don't pay much attention to details.	Global	Focusing on abstract ideas
• I like problems that require engagement with details.	Local	Focusing on concrete ideas
• I like to be alone when working on a problem.	Internal	Enjoying working independently
• I like to work with others rather than by myself.	External	Enjoying working in groups
• I like to do things in new ways, even if I am not sure they are the best ways.	Liberal	Using new ways to deal with tasks
• In my work, I like to keep close to what has been done before.	Conservative	Using traditional ways to deal with tasks

ERRATUM

In the article by Li-fang Zhang, "Approaches and Thinking Styles in Teaching" (September 2001, Vol. 135, No. 5), Table 3 on page 556 is not the correct table. Table 3 for that article is printed below.

TABLE 3
Predictive Validity of Teachers' Perceptions of Work Environment
for Approaches and Thinking Styles in Teaching

Measure	Legislative	Executive	Judicial	Global	Liberal	Conservative	CCSFI
R^2_1	$.07_{Content}$	$.10_{Prospect}$	$.19_{Training}$	$.10_{Salary}$	$.08_{Training}$	$.09_{Prospect}$	$.10_{Training}$
β_1	$.27^*$	$.32$	$.37_{Training}$**	$.31^*$	$.28^*$	$.29^*$	$.32^*$
R^2_2			$.10_{Salary}$				
β_2			$.32_{Salary}$**				
F	4.69^*	6.09^*	10.79^{***}	5.74^*	4.83^*	5.11^*	5.73^*
df	$(1, 62)$	$(1, 53)$	$(2, 54)$	$(1, 54)$	$(1, 55)$	$(1, 55)$	$(1, 52)$

Note. $N = 76$, and listwise deletion was used. Content = be allowed to determine contents of teaching; Prospect = prospect for a salary increase; Salary = satisfaction with one's salary; Training = belief in the adequacy of one's training for the role as a teacher; CCSFI = Conceptual Change/Student-focused/Intention. Subscripts in Column 1 indicate the number of independent variables that contribute to dependent variables.
$*p < .05. **p < .01. ***p < .001.$