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Relationships between teachers' perceived leadership style, students' learning style, and academic achievement: a study on high school students

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There is debate about whether the leadership style of the teacher or the learning style of the student affects academic achievement more. A large sample ($n = 746$) of eighth-grade students in Istanbul, Turkey, participated in a study where the leadership style of the teacher was assessed in terms of people orientation and task orientation. The learning styles examined were: group, individual, visual, auditory, tactile, and kinesthetic. Multiple discriminant analysis indicated that teacher leadership style was the main factor affecting academic performance. No significant relationship was found between learning style and academic achievement.

The term "learning style" refers to the way in which a learner approaches the learning process, and learns and retains new and difficult information (Dunn, 1991). It is a personal trait that develops from inherited characteristics, previous experience, and the demands of the present environment (Kolb, 1981, 1984). In short, learning style is claimed to explain the preferred attitudes and behaviours towards learning (Honey & Mumford, 1992).

It is argued that students' learning styles differ (Kolb, 1976, 1981; Marton & Saljo, 1976; Richardson, 1990). Also, it is sometimes claimed that knowledge of learning style, and use of educational resources relevant to learning style, will lead to efficient learning (Gadzella, Stephens, & Baloglu, 2002; Wynd & Bozman, 1996) and an increase in the motivation to learn (Curry, 1987; Marshall, 1987). In addition, it is sometimes argued that teachers are most helpful when they help students to learn in a way that suits their style preference (Dunn & Dunn, 1991; Federico, 1991).

Teachers will also have their own approaches to learning, and may or may not design their teaching interactions mainly from the perspective of their own style. "Teaching style" consists of a teacher's personal behaviours and the media used during interaction with learners (Kaplan & Kies, 1995). In other words, it is mostly related to how the teacher teaches or to the instructional methods used (Felder & Silverman, 1988).

Irrespective of a student's learning style, the teacher will be a significant influence in the student's learning experience. However, does this suggest that adapting teaching style to the learning style of students results in improved academic achievement? Much research has focused on the effect of matching and mismatching teaching and learning styles. Different approaches have been suggested: matching instructional methods, media, and assessment to learner preferences and tendencies; mismatching styles in order for the learner to develop a broader approach to learning (Sadler-Smith & Riding, 1999); providing the initial contact with material in the learner's preferred mode, then moving to broader exposure with subsequent material (Reinert,

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1976); or teaching to all styles (Felder, 1993). A review of the use of various style classification systems by Coffield, Moseley, Hall, and Ecclestone (2004) suggests that there are many issues to address in relation to using learning style research with students. The situation is not as straightforward as simply matching the style of learning of an individual (as measured by some style instrument – of which there are many) with the style of teaching, even if this were practical in the modern classroom.

Nevertheless, it has been argued that teacher behaviour can enhance student learning (Southworth, 2002), and that teacher leadership behaviour can affect student achievement outcomes (Sheppard, 1996). According to McCombs (1997), focusing on a learner's interests and needs creates a positive learning environment and enhances the learner's performance. Given the lack of evidence in favour of matching teaching and learning styles, we focus here on the influence of teacher leadership style, which describes teacher attitude and approaches towards students, with reference to academic achievement. We investigate whether there may be a relationship between teacher leadership style and student learning.

Method

Participants

Participants were 746 randomly selected eighth grade students from seven mixed-sex public schools in Istanbul, Turkey. Private schools were not included in the study. Of the students, 54% were female and students' average age was 13.9 ($SD = 0.46$).

Instruments

Two scales were used to reveal students' learning styles and teachers' leadership styles.

Learning style. Reid's (1984) Perceptual Learning Style Preference Questionnaire (PLSPQ) was used to measure students' learning style. The PLSPQ has been used in a range of studies, and is claimed to be a valid and reliable instrument (e.g., Rossi-Le, 1995; Stebbins, 1995; Wintergersta, DeCapuab, & Itzenc, 2001). Although created for the assessment of foreign language learning, it can be used in other contexts since its statements are very general – they do not involve terms or learning approaches specific to language learners.

The PLSPQ was selected as it assesses six dimensions of learning style of interest in this study: group learning (the tendency of individuals to learn in groups), individual learning (the tendency of individuals to work alone), visual learning (reading, studying charts, watching videotapes, etc.), auditory learning (listening to lectures, audiotapes, etc.), tactile learning ("hands-on" learning, such as practical activities), and kinesthetic learning (physical involvement in a learning task).

Students rated the items on a five-point Likert scale (5 = the most positive, 1 = the most negative). Factor analysis was used to determine whether the dimensions of the Likert scale were consistent with the original scale. The results of the factor analysis (rotated by varimax), performed by taking the six factors in the original scale into consideration, demonstrated consistency in all but four statements of the original scale (see Table 1). The statements for which the factor fell below .40 were eliminated: that is, the learning style evaluations were performed with a modified factor structure. The Cronbach α values were at an acceptable level (above .60).

Leadership style. The leadership styles of the teachers were evaluated according to behavioural leadership theories, and were investigated from two perspectives: orientation to task and

Table 1. Varimax rotated component matrix for the PLSPQ.

Statement	Individual	Group	Visual	Kinesthetic	Tactile	Auditory
30	.71					
13	.71					
27	.70					
18	.69					
24[a]	.56					
28	.53					
29[a]	.52					
5		.80				
4		.77				
23		.74				
3		.71				
21		.47				
20[a,b]		.34				
12			.72			
10			.71			
22			.69			
11			.67			
2				.74		
8				.71		
19				.56		
26				.43		
25					.77	
14					.75	
16					.58	
15[b]					.46	
1						.74
17						.73
9[c]						.47
6[a,b]						.33
7[b]						.23
Cronbach's α	.80	.80	.72	.64	.67	.63

Kaiser–Meyer–Olkin (KMO) = .814; Bartlett's test $p < .05$; total variance explained = 50.5%.

[a]This statement was not in the original scale.

[b]Statements having factor loads lower than .40 were excluded.

[c]This item was excluded as it lowered the value of Cronbach's α to .45.

orientation to people (Gordon, 1999). A scale was developed to evaluate teachers' leadership styles. The teachers were evaluated by the learners, which is a common method used in studies investigating the relationship between students' success and teacher variables (traits, knowledge, etc.; see Brown, 2004; Forrester-Jones, 2003; Kember & Wong, 2000; Tatro, 1995; Zhongqi, 2000). First, students were asked to evaluate the leadership style of the teacher of a course in which they were successful; second, they were asked to evaluate the leadership style of the teacher of a course which they had failed. It is assumed here that learner perceptions of teacher leadership style do match the actual leadership style, although it is the perceptions of the students

Table 2. Varimax rotated component matrix for the educational leadership style scale.

Statements	People-oriented	Task-oriented
8	.80	
9	.79	
15	.76	
13	.76	
10	.75	
11	.74	
6	.74	
1	.73	
4		.66
2		.58
14		.58
7		.56
3		.55
12		.45
5[a]	.40	.42
16[a]	−.40	.41
Cronbach's α	.90	.64

KMO = .92; Bartlett's test $p < .05$; total variance explained = 47.7%.

[a]Item excluded as it was related to both factors.

that are more important in this study. The common use of student ratings for assessing teaching quality (Penny, 2003) also supports this perspective.

The scale comprises 16 statements assessing two factors. Two statements were eliminated from the scale because they are relevant to both factors. The first factor is related to people-oriented leadership styles and the second to task-oriented leadership styles. If the first factor is high, the teacher exhibits people-oriented leadership (e.g., being available to students when they need help, acknowledging student success, taking students' moods into consideration, encouraging students to express themselves, etc). If the second factor is high, this indicates task-oriented leadership (e.g., focusing exclusively on issues related to lessons, ignoring the feelings of students, reprimanding in the case of failure, etc.). In this study, the two leadership styles are not considered mutually exclusive. The Cronbach α values of factors are at an acceptable level (above .60).

Procedure

Randomly selected students from public schools were asked to evaluate the leadership styles of their teachers of the courses in which they were most successful and most unsuccessful. Grades were recorded in order to check student perceptions of success against actual success. Students whose grade was at least 75 out of 100 were defined as successful, and those whose grade was below 30 were defined as unsuccessful. If a student defined himself/herself as unsuccessful although he/she had a grade over 30, he/she was excluded from the analysis. The same procedure was applied to students who defined themselves as successful although they had grades lower than 75.

As the subject taught might mediate the relationship between students' academic achievement, learning styles, and teachers' leadership styles, the courses were divided into two main

groups according to type of content: verbal (literature, psychology, business, history, geography, language, etc.) and analytic (mathematics, physics, chemistry, science, statistics, etc.).

Since teachers were chosen by the students according to students' success levels, not all of the teachers were rated by the same group of students. In terms of gender, 67% of the teachers evaluated by the students were female.

Statistical analysis

Mean and standard deviation values were used to describe the learning and leadership styles of participants. A two-way ANOVA test was used to determine whether the mean values differed according to students' success in a subject or the field of the subject. Additionally, a two-group discriminant analysis was used to explore the effect of leadership style, learning style, and field of the subject (independent variables) on academic achievement (dependent variable). The SPSS 10.0 statistics program was used.

Results

Effect of teacher leadership style on academic achievement

There was a significant difference between the successful and unsuccessful courses in terms of people-oriented leadership style (F [1,1443], $p < .01$): people-oriented leadership was higher in successful courses (mean 3.76) than in unsuccessful ones (mean 2.57). In other words, while the teachers of courses in which the students accepted themselves as successful displayed people-oriented leadership, the teachers of the courses in which the students considered themselves unsuccessful did not. There was no significant difference in leadership style across course content area (F [1,1443], $p > .05$). Additionally, there was no joint effect of achievement and course content on student evaluations of their teachers' people-oriented leadership (F [3,1443], $p > .05$).

There was also a significant difference between the successful and unsuccessful courses in terms of teachers' task-oriented leadership style (F [1,1443], $p < .01$). Task-oriented leadership style was higher in unsuccessful courses (mean 3.33) than in successful courses (mean 2.77).

Table 3. Leadership styles versus academic achievement and field of study.

Leadership style	Achievement	Field	*n*	*M*	*SD*
People-oriented	Successful	Verbal	384	3.74	.89
		Quantitative	324	3.78	.89
		Total	708	3.76	.89
	Unsuccessful	Verbal	302	2.50	.92
		Quantitative	434	2.63	.96
		Total	736	257	.95
Achievement: F [1,1443], $p < .01$; field: F [1,1443], $p > .05$; achievement and field: F [3,1443], $p > .05$					
Task-oriented	Successful	Verbal	384	2.74	.77
		Quantitative	324	2.81	.80
		Total	708	2.77	.78
	Unsuccessful	Verbal	302	3.38	.78
		Quantitative	434	3.29	.86
		Total	736	3.33	.83
Achievement: F [1,1443], $p< .01$; field: F [1,1443], $p > .05$; achievement and field: F [3,1443], $p > .05$					

Again, the means showed no significant difference across fields of study (F [1,1443]=0,024, $p >$ .05). Academic achievement and field of study had no joint effect on student evaluations of their teachers' task-oriented leadership (F [3,1443]=3,256, $p >$ .05).

Effect of student learning style on academic achievement

As shown in Table 4, none of the learning styles showed any significant difference based on academic achievement (group: F [1,1443]= 0,046, $p >$ .05; individual: F [1,1443]= 0,087, $p >$ .05; visual: F [1,1443]= 0,179, $p >$ .05; auditory: F [1, 1443]= 0,053, $p >$ 05; tactile: F [1,1443] = 0,039, $p >$ .05; kinesthetic: F [1,1443]=0,012, $p >$ .05).

We investigated whether achievement and field of study jointly had a significant effect on learning style, and found that only the group learning style showed a significant difference (group: F [3,1443]= 6,509, $p <$ .05; individual: F [3,1443]= 0,083, $p >$ .05; visual: F [3,1443]=1,071, $p >$ .05; auditory: F [3,1443] = 0,328, $p >$ .05; tactile: F [3,1443] = 0,221, $p >$ .05; kinesthetic: F [3,1443]=0,387, $p >$ .05; see Table 4).

Students who were successful in verbal lessons had lower scores on group learning style (mean 3.20) than students who were unsuccessful students in verbal lessons (mean 3.32). Accordingly, students who were successful in quantitative lessons had higher scores on group learning (mean 3.30) than the unsuccessful ones (mean 3.20).

Effect of student learning style and teacher leadership style on academic achievement

Two-group discriminant analysis was employed to explore the effect of leadership and learning styles on academic achievement (success was coded as 1, being unsuccessful was coded as 2).

According to the results (Table 5), academic achievement was mostly related to the extent to which the teacher was perceived to display people-oriented leadership (r = .917, $p <$ .01). Thus, the more the teacher displayed this leadership behaviour, the higher the students' chances of being successful in that course. Task-oriented leadership style was correlated negatively with academic achievement (r = –.492, $p <$ .01): in other words, teachers displaying lower task-oriented leadership style supported students' academic achievement. Although significant, the field of study was not correlated as strongly (r = .190, $p <$ .01; i.e., $r <$ .40): students' chances of success increased when the lesson was verbal.

In contrast, learning style did not have a significant effect on academic achievement ($p >$ .05): student success in either verbal or quantitative subjects did not depend on student learning style.

Conclusion

This study has demonstrated that, in this context, the most important factor affecting student academic success was student perception of people-oriented leadership from the teacher. Thus we could say that teachers contributed most to student success when students felt that teachers displayed consideration for them. In other words, teachers who focused on the course and not the students, keeping students at a distance, did not positively affect student success. In contrast, taking the student's mood into consideration and showing a special interest in the student's self-development affected the student's academic achievement positively.

As also found in other contexts, this study revealed that learning styles were not a significant factor affecting academic success. This applies regardless of the field of study (verbal or quantitative). One of the reasons for this may be that teachers in public high schools in Turkey do not usually consider the learning styles of their students (teaching based on memorisation is a common teaching strategy). It should also be mentioned that public high schools in Turkey often lack adequate teaching environments (e.g., no science laboratories), so students do not always

Table 4. Learning styles versus academic achievement and field of study.

Learning style	Achievement	Field	*n*	*M*	*SD*
Group	Successful	Verbal	324	3.20	.83
		Quantitative	384	3.30	.80
		Total	708	3.26	.82
	Unsuccessful	Verbal	434	3.32	.82
		Quantitative	302	3.20	.83
		Total	736	3.27	.82
Achievement: F [1,1443], $p > .05$; field: F [1,1443], $p > .05$; achievement and field: F [3,1443], $p < .05$					
Individual	Successful	Verbal	324	3.49	.83
		Quantitative	384	3.48	.84
		Total	708	3.48	.84
	Unsuccessful	Verbal	434	3.49	.85
		Quantitative	302	3.45	.78
		Total	736	3.47	.82
Achievement: F [1,1443], $p > .05$; field: F [1,1443], $p > .05$; achievement and field: F [3,1443], $p > .05$					
Visual	Successful	Verbal	324	4.19	.70
		Quantitative	384	4.10	.75
		Total	708	4.14	.73
	Unsuccessful	Verbal	434	4.14	.74
		Quantitative	302	4.12	.71
		Total	736	4.13	.73
Achievement: F [1,1443], $p > .05$; field: F [1,1443], $p > .05$; achievement and field: F [3,1443], $p > .05$					
Auditory	Successful	Verbal	324	4.17	.79
		Quantitative	384	4.19	.77
		Total	708	4.18	.78
	Unsuccessful	Verbal	434	4.14	.81
		Quantitative	302	4.21	.75
		Total	736	4.17	.79
Achievement: F [1,1443], $p > .05$; field: F [1,1443], $p > .05$; achievement and field: F [3,1443], $p > .05$					
Tactile	Successful	Verbal	324	3.52	.86
		Quantitative	384	3.48	.82
		Total	708	3.50	.84
	Unsuccessful	Verbal	434	3.51	.85
		Quantitative	302	3.51	.80
		Total	736	3.51	.83
Achievement: F [1,1443], $p > .05$; field: F [1,1443], $p > .05$; achievement and field: F [3,1443], $p > .05$					
Kinesthetic	Successful	Verbal	324	4.22	.65
		Quantitative	384	4.16	.63
		Total	708	4.19	.64
	Unsuccessful	Verbal	434	4.19	.64
		Quantitative	302	4.18	.63
		Total	736	4.19	.63
Achievement: [1,1443], $p > .05$; field: F [1,1443], $p > .05$; achievement and field: F [3,1443], $p > .05$					

Table 5. Results of discriminant analysis.

Variables	Structure	*r*	*F*	*p*
Leadership style	People-oriented	.917	597,465	.000*
	Task-oriented	–.492	172,254	.000*
Field of study		.190	29,645	.000*
Learning style	Auditory	.015	.160	.689
	Group	–.014	.134	.714
	Visual	.011	.079	.778
	Tactile	–.008	.049	.825
	Individual	.008	.049	.826
	Kinesthetic	.000	.000	.997

Box's M = 58,829, F [15,8517989]=1,299, p = .086
Canonical correlation = .574
Wilks λ = .670, χ^2 = 575,667, p = .000
*p < .01

have the opportunity to learn according to their preferred learning styles. However, as described by Coffield et al. (2004) in a survey of learning style research, using learning style research in education does not necessarily produce positive results: thus the local context of this study may not be a key factor. This question will remain unresolved until there is a fuller understanding of the impact of learning style in a variety of educational contexts.

Although it has been argued that there is no "best" leadership style in education (Sexton & Switzer, 1977), in this study the teachers of the courses in which students were successful were always perceived to display people-oriented leadership styles. Further research is required, therefore, to investigate the extent to which our findings in the local Turkish context are relevant to other learning environments.

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