



# A Study on the Influence of the Matching between Learning Style and Teaching Style on the Academic Record of English Majors

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## Authors' contributions

*This work was carried out in collaboration between all authors. Authors LY and XR designed the study, wrote the protocol and supervised the work. Authors XR and WK carried out all laboratories work and performed the statistical analysis. Author WK managed the analyses of the study. Author XR wrote the first draft of the manuscript. Author XR managed the literature searches and edited the manuscript. All authors read and approved the final manuscript.*

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## ABSTRACT

Educational researches, over the last few decades, have focused on the debate over which classroom pedagogy best encourages learning: the match approach, the mismatch approach or the balanced approach. Most studies on this issue appear to support the argument that the matching between teaching style and learning style can improve students' learning efficiency. However, those related supporting researches are usually limited to the secondary education. Furthermore, a factor prone to be ignored is that students' learning style may change, for instructional objectives differ in different learning periods. Therefore, in order to conduct a more accurate and reliable research, this study will focus on 150 English majors and 3 teachers from Beijing International Studies University. The "Style Analysis Survey" [1] was used to test teachers' and students' style preferences. Conclusions have been reached that the match approach is needed in "global, analytic" and "visual, auditory" dimensions. However, the mismatch approach is needed in

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“introverted and extroverted” dimension. What’s more, the “open students” usually achieve better academic record than the “closure-oriented students”. Based on all these findings, the balanced approach is more recommended than the match approach or the mismatch approach in English major education.

*Keywords: Learning style; teaching style; the match approach; the mismatch approach; academic record.*

## 1. INTRODUCTION

The study on learning style has been popular in these years, and researches on which pedagogy (match, mismatch or the balanced approach) best encourages learning has become the focus of educators. As learning style is relatively stable, those previous studies are still available nowadays. Most scholars have come to the common ground that previous researches on learning style can not only serve as a guidance for language teaching, but also help learners better understand the advantages and disadvantages of their own learning ways. Dunn [2], Felder [3], Stitt-Gohdes [4] held that making good use of learning style theory is good for learners to improve academic record, especially when the teaching style matches the learning style. While, scholars such as Letteri [5], McCarthy [6], Hayes & Allison [7] and Spoon & Shell [8] held that the mismatch approach is beneficial to students. Apart from that, Hunt [9], Gregorc [10], Galloway & Labarca [11] and Kinsella [12] support the balanced approach, with the assertion that teachers should take advantage of both the match model and mismatch model in teaching process.

In recent years, learning style has become a popular topic and researches on it have become mature. Scholars such as Dunn and Price [2], Kolb [13], Keefe [14], Reid [15], Kinsella [12] have contributed a lot to the development of learning style theory. Domestic studies on learning style have developed a lot in recent years. However, most studies about learning style are concerned with introducing western research findings directly into China. Meanwhile, empirical studies are needed since most studies are limited to theoretical research. Few empirical studies have discussed the relationship between teaching style and learning style, let alone the study on the influence of the matching between teaching style and learning style on students’ academic record, especially the influence on English majors. Therefore, this paper is going to fill the gap.

## 1.1 Learning Style Theory

Learning style is the method which students would choose to use in the process of learning, which was initially advocated by Herbert Thelen in 1954. Dunn and Price [2] identified 21 types of learning style in “The Learning Style Inventory”. Kolb [13] developed “the Experiential Learning Model” which is composed of four elements. Keefe [14] described learning style as the approach through which the learner develops the perception and cognition towards the learning environment. In addition, Reid [15] professed that “learning style refers to an individual’s natural, habitual, and preferred way of absorbing, processing, and retaining new information and skills which persist regardless of teaching methods or content”. Kinsella [12] argued that learning style contains perception, cognition, conceptualization, affection and behavior. Apart from western studies, Chinese scholars such as Li [16], He [17] and Xin [18] also made great contributions on this issue. They have revised western theories based on the factual circumstance in China to make it more viable and persuasive.

## 1.2 Match Approach, Mismatch Approach and Balanced Approach

There are divergences on the issue that whether teaching style should be in conformity with learning style, and both international and domestic scholars have done researches on that. Three representative views have been reached: match approach, mismatch approach and balanced approach.

Match approach means that teaching style should correspond with learning style. Scholars who favor this approach argued that the mismatching could have negative effects on students’ language learning. In this approach, teachers are required to know students’ learning style in advance and teaching accordingly. Mismatch approach means that it would be dangerous if teachers only teach in students’

avored ways. In this approach, teachers could take traits of students' learning style into account, but not follow them blindly. Balanced approach is a transition from the mismatch approach to match approach, which argues that both the match and mismatch approaches should be used depending on different circumstances.

### 1.3 Studies on the Match/Mismatch of Learning and Teaching Style

International scholars have done more theoretical and empirical studies on this issue than domestic scholars. Based on the theoretical studies, Dunn [19] claimed that teaching materials and teaching methods should be in accordance with students', seeing that a matched teaching style could have a positive effect on students' learning process. Except the theoretical researches, Stitt-Gohdes [4] used empirical evidences to support and confirm that the match approach could improve the learning motivation and academic record. Felder [3] found that students who have an accordant learning style with teachers could have a better memory of knowledge, and have a more positive attitude toward their curriculums. To sum up, the match approach supports the idea that if the teaching style is in accord with the learning style, it will improve students' learning efficiency. On the contrary, it will not only decrease student's learning interest, but also cause frustrations to students and teachers. What calls for special attention is that most of the studies aim at high school students rather than adult learners, so the conclusion is not comprehensive.

However, some scholars possess different opinions. Letteri, Spoon, Shell and McCarthy are the representatives who propose the mismatch approach. McCarthy [6] claimed that the match approach is not the best method in promoting long-term memory. She put forward the 'four mat system' which described teaching as a spiral process. No matter what kind of learning style one obtains, according to the 'four mat system', one can always get 25% of the matched teaching and 75% of the mismatched teaching. Other empirical researches show that the match approach is not suitable for adults since learning style may change according to age, surroundings and many other factors. Hayes & Allinson [7] held that students should come across different teaching methods, which may help improve their learning abilities, and help them adapt to different learning environments.

Besides the match approach and the mismatch approach, some scholars held that the balanced approach. Doctor Hunt [9] put forward a viewpoint that both teaching style and learning style vary over time. On one hand, teachers should use the match model on the basis of students' cognitive competence. On the other hand, teachers' role should be reduced step by step, and automatic learning is encouraged during the study. Gregorc [10] contended that the mismatch model could also be used in the class to make students think independently. Galloway & Labarca [11] argued that all students should be given the opportunity to experience different kinds of teaching style and should be encouraged to diversify their learning preferences. Kinsella [12] addressed that "Without a fundamental awareness of our own preferences, it is easy to believe that the way we study and learn is the most efficient way and consequently to bias our teaching in favor of students who approach learning in much the same way we do".

It is improper to introduce western theories directly in China, because the situation is different. Since the 2000s, many domestic studies have been conducted in order to get a more reliable outcome. Li [16] maintained that the identification of students' learning style is essential for both teachers and students. Only in this way, can teachers teach students in accordance of their aptitude, and students improve themselves gradually. Xin [18] found that the mismatching between learning style and teaching style is relatively common in China and suggested that teachers should take students' learning style into account in the teaching process.

## 2. MATERIALS AND METHODS

All Participants in this study are from the English Department of Beijing International Studies University (BISU), including 150 junior English majors from five classes and 3 teachers. All the students have passed the TEM-4 which means everyone is supposed to have a vocabulary of 5000-8000 and could use English well. Students' average age is 21.3 years old. The three English teachers are all males from the corresponding classes. Teacher A teaches Class one to Class three; Teacher B teaches Class four and Class five; Teacher C teaches Class six. More details could be found in Table 1.

**Table 1. Student participants**

	Male	Female	Total
Class 1 (Teacher A)	6	18	24
Class 2 (Teacher A)	5	16	21
Class 3 (Teacher A)	6	18	24
Class 4 (Teacher B)	7	18	25
Class 5 (Teacher B)	7	22	29
Class 6 (Teacher C)	6	21	27
Total	37	113	150

Two sets of materials were implemented in this research, a questionnaire and an examination. The questionnaire was applied to measure both students' and teachers' preferences. Besides, an exam was used to test students' learning results. The subject "Introduction to General Linguistics" was chosen to evaluate the students' competence. During the past two years, only students' language using ability is emphasized, including listening, reading, speaking and etc. So, students' knowledge is the perceptual one. However, in linguistic class, students will learn conceptual knowledge, such as Phonetics, Semantics, Syntax, Pragmatics and Morphology and etc. Given this, almost all the students begin from the same level. Besides, the students from the selected classes almost have the same language competence by consulting their Academic GPA and the TEM 4 scores, so the comparisons of the different academic record resulting from different teaching and learning styles could be used to claim whether the match or mismatch approach influences students' academic record. The final score of the exam would show students' learning outcomes. We are going to see whether matching or mismatching of teaching style and learning style would affect students' academic record.

To achieve a higher reliability, the Style Analysis Survey (SAS) is designed to assess one's general approach to learning and working. SAS is originally a four-point (0-3) scale survey, with "0" representing "never" and "3" representing "always". This format was modified in the current research as a scale of five points (1-5) with the purpose of attaining higher accuracy. The questionnaire consists of five parts, and each part measures participants' tendency towards these five dimensions (1) "global vs. analytic", (2) "extroverted vs. introverted", (3) "visual vs. auditory", (4) "intuitive-random vs. concrete-sequential" and (5) "closure-oriented vs. open".

All chosen informants were required to fill in the questionnaire. The questionnaire was done at the end of the linguistic class and each student's score on the five dimensions was calculated. The data was double-checked so that there were as few deviations as possible from participants' real responses. The recording and proofreading process was realized with Microsoft Excel. Mean and standard deviation were reckoned for every dimension. The data would serve for a further analysis.

### 3. RESULTS AND DISCUSSION

In this section, the results of the measurements will be demonstrated and a brief analysis will be complemented whenever it is necessary. Learning Style Preference is abbreviated as LSP, Teaching Style Preference is abbreviated as TSP, and Exam Score Mean is abbreviated as ESM which refers to the average score of the final examination of linguistics. Table 2 to Table 6 show students' learning preferences and teachers' teaching preferences in terms of the five distinctions made in previous chapters. And Table 7 is an overall analysis of the five dimensions.

#### 3.1 Analytic versus Global

The Distinction I, namely "analytic vs. global", shows how students and teachers deal with information. If one is analytic, one focuses more on details, logical analysis, and contrasts. If one is global, one enjoys getting the main idea, guessing meanings, and communicating even if one does not know all the words or concepts. So the analytic teachers tend to ask the students to recite all the concepts in the textbook accurately, do homework and explain the exercises one by one. In contrast, the global teachers only request the students to get the main idea of the content and discuss the obscure issues for a better understanding.

**Table 2. Distinction I “Analytic vs. Global”**

	<b>Class 1</b>	<b>Class 2</b>	<b>Class 3</b>	<b>Class 4</b>	<b>Class 5</b>	<b>Class 6</b>
LSP	Analytic	Global	Analytic	Analytic	Analytic	Analytic
TSP	Analytic	Analytic	Analytic	Analytic	Analytic	Analytic
ESM	66.14	63.70	73.20	68.08	71.98	72.16

**Table 3. Distinction II “Extroverted vs. Introverted”**

	<b>Class 1</b>	<b>Class 2</b>	<b>Class 3</b>	<b>Class 4</b>	<b>Class 5</b>	<b>Class 6</b>
LSP	Introvert	Extrovert	Introvert	Extrovert	Introvert	Introvert
TSP	Introvert	Introvert	Introvert	Introvert	Introvert	Extrovert
ESM	66.14	63.70	73.20	68.08	71.98	72.16

**Table 4. Distinction III “Intuitive-random vs. Concrete-sequential”**

	<b>Class 1</b>	<b>Class 2</b>	<b>Class 3</b>	<b>Class 4</b>	<b>Class 5</b>	<b>Class 6</b>
LSP	Concrete	Concrete	Concrete	Concrete	Concrete	Concrete
TSP	Concrete	Concrete	Concrete	Concrete	Concrete	Concrete
ESM	66.14	63.70	73.20	68.08	71.98	72.16

**Table 5. Distinction IV “Visual vs. Auditory”**

	<b>Class 1</b>	<b>Class 2</b>	<b>Class 3</b>	<b>Class 4</b>	<b>Class 5</b>	<b>Class 6</b>
LSP	Visual	Visual	Auditory	Visual	Visual	Visual
TSP	Auditory	Auditory	Auditory	Auditory	Auditory	Auditory
ESM	66.14	63.70	73.20	68.08	71.98	72.16

In Table 2, except for students from Class 2, the other respondents are all analytic. The effect of the mismatching between learning style and teaching style is significant. As Class 2 did the poorest on the exam, it indicates that the mismatch approach exerts a negative influence somehow. Therefore, the match approach is needed in this dimension.

### 3.2 Extroverted versus Introverted

In Distinction II, namely “extroverted vs. introverted”, it shows how students and teachers deal with other people. If one is extroverted, one is prone to be fond of interactive learning tasks such as games, conversations, discussions, debates, role-plays or simulations. If one is introverted, one likes to do more independent work. For instance, one may prefer studying or reading by himself or herself. Introverted person would like to work with someone he or she knows well rather than strangers. The extroverted teachers favor the student-oriented class in which students are likely to be invited to discuss in groups. The introverted teachers just throw questions to the students and usually ask his or her favorite student to answer it.

According to Table 3, students of Class 2 and Class 4 are sociable, enjoy group work and prefer getting energy from the others. While students of Class 1, 3, 5, 6 like to work alone, depend more on themselves and feel energy is sapped when they cooperate with others. Among the teachers, only Teacher C is extroverted, Teacher A and Teacher B are all introverted. However, it is not obvious to find the connection among those variables. Taken Class 1 and Class 3 for instance, although students and teachers of these two classes are all introverted, their average scores are quite different. Also, seen from Class 2 and Class 4, it is hard to explain why the same variables have different influences on students’ academic record. As it is still far from making a convincing conclusion, a more reasonable conclusion will be made in Table 7 (the global picture).

### 3.3 Intuitive-random versus Concrete-Sequential

This distinction will show how one handles possibilities. The intuitive-random type refers to people who become habituated to randomness and freedom. They prefer talking about futuristic possibilities. They are accustomed to decide by

themselves and can do a good job without any authoritative guidance. On the contrary, the concrete-sequential type tends to talk about the present tasks, ask for explicit directions and need authoritative guidance. The intuitive-random teachers would like the students to decide by themselves and encourage the students to challenge the authority. The concrete-sequential teachers give assignments every day and let the students follow his or her authority accordingly.

According to Table 4, the result shows that all respondents are concrete-sequential. Therefore, it is hard to tell whether the interaction of learning style and teaching style make positive or negative effects on students' academic record.

### 3.4 Visual versus Auditory

This distinction shows how one uses physical senses to study or work. If one is a visual person, one relies more on the sense of sight and more frequently learns through visual means, such as books, videos, charts and pictures. If one is an auditory person, one prefers listening and speaking activities, such as discussions, debates, role-plays and lectures. The visual teachers tend to ask the students to read more books, and would recommend one film per week. The auditory teachers would encourage the students to listen to VOA or BBC every day, and encourage them to speak more in class.

Seen from the Table 5, only students and teacher of Class 3 are well-matched. For the average score of Class 3 is the highest, we may consider that the match approach is the crux of achieving a better academic achievement.

What's more, seeing that the degree of the visual preference is stepping up, it is important for teachers to use more visual instructions in teaching.

### 3.5 Closure-oriented versus Open

This distinction indicates how one approaches tasks. If one is closure-oriented, one favors explicit directions and always plans ahead of assignments. On the contrary, if one is an open type, one enjoys learning by discovery, in another word, picking up information all by oneself, and continuing one's learning without concern for deadlines or rules. The closure-oriented teachers would like to give main points of the text and let the students preview based on that. The open teachers usually let the students learn by themselves without giving any instructions and encourage them to share and discuss their ideas in class.

Table 6 shows that the open type did much better on the exam than that of closure-oriented students. However, when comparing Class 1 with Class 4 or Class 3 with Class 5, the same variables cause different results. Since students' academic record is not simply influenced by one factor, after summarizing all the five dimensions, a more convincing conclusion will be reached.

### 3.6 An Overall Analysis of the Five Dimensions

Seen from the above results, students' academic record is pertinent to both learning style and teaching style.

**Table 6. Distinction V "Closure-oriented vs. Open"**

	<b>Class 1</b>	<b>Class 2</b>	<b>Class 3</b>	<b>Class 4</b>	<b>Class 5</b>	<b>Class 6</b>
LSP	Closed	Closed	Open	Closed	Open	Open
TSP	Closed	Closed	Closed	Closed	Closed	Open
ESM	66.14	63.70	73.20	68.08	71.98	72.16

**Table 7. An overall analysis of the five dimensions**

	<b>Class 1</b>	<b>Class 2</b>	<b>Class 3</b>	<b>Class 4</b>	<b>Class 5</b>	<b>Class 6</b>
Global vs Analytic	Match	Mismatch	Match	Match	Match	Match
Introvert vs Extrovert	Match	Mismatch	Match	Mismatch	Match	Mismatch
Visual vs Auditory	Mismatch	Mismatch	Match	Mismatch	Mismatch	Mismatch
Intuitive vs Concrete	Match	Match	Match	Match	Match	Match
Closure vs Open	Match	Match	Mismatch	Match	Mismatch	Match
ESM	66.14	63.70	73.20	68.08	71.98	72.16

Firstly, in “analytic and global” dimension, the result reveals that the teaching and learning efficiency would be raised, if students and teachers share a same thinking habit. Taken Class 2 and Class 4 or Class 2 and Class 6 for example, except “analytic and global” dimension, the other four dimensions remain the same. Therefore, students’ final score can directly show whether they are influenced by the matching or mismatching of the analytic and global styles. As the average score of Class 4 is higher than that of Class 2, it shows that sharing a mutual thinking habit, either analytic or global, will do good to students’ academic record.

Secondly, in “introverted and extroverted” dimension, the result shows that the mismatch approach is better for students’ learning. Between Class 1 and Class 6 or Class 1 and Class 4, although learning style and teaching style of Class 1 are well matched, the average score is relatively low. On the contrary, even though Class 6 is mismatched, the average score is much higher than that of Class 1. In the light of an extroverted teacher would be good at animating teaching atmosphere, he may easily make friends with students. The closer the student-teacher relationship is, the higher the teaching efficiency will be. Hence, in order to stimulate more students to actively involve in in-class activities, teachers are suggested to organize more group discussions or role plays. Moreover, considering that most students are introverted and seldom use English to communicate, teachers should provide more opportunities for them to practice oral English, and in order to achieve that, extroverted teachers are needed anytime.

Thirdly, the match approach is needed in “visual, auditory” dimension. For example, comparing Class 3 with Class 5, the mismatching between students’ learning style and teachers’ teaching style make Class 5 get the worst score. Although, teaching methods are diversified nowadays, many Chinese teachers still prefer using the auditory teaching method. Some students professed that they are prone to be absent-minded in class unless the teachers use power points or flash cards to show teaching materials. Visual information may help students get a better understanding of what has been taught when they feel puzzled in class. As a consequence, except the match approach, more visual means should be adopted in English teaching.

Fourthly, in “intuitive-random and concrete-sequential” dimension, owing to the matching

between teaching style and learning style in all the six classes, no conclusions could be reached from the data. Last but not least, in “closure-oriented and open” dimension, students in Class 3 and Class 5 achieved the best academic record, which shows that learning by discovery is more beneficial than spoon feeding. Once coming across difficulties, open students usually perform much better than closure-oriented students. Hence, both students and teachers are suggested to become the open-type. In addition, disciplines should be established by teachers in advance in case that the open students care less about deadlines or rules.

After analyzing the data, suggestions have been raised for learning and teaching. First, students should be encouraged to get accustomed to different kinds of teaching style. However, a large number of students in the class make it impossible for teachers to teach students in accordance of their aptitude, so students should shift their learning styles accordingly. Second, to enhance the cooperation between teachers and students, teachers should adjust their teaching style appropriately and accordingly, and never stop improving and diversifying their teaching methods. What’s more, teachers should help students form good habits of autonomous study. In order to achieve this, “teachers should set tasks which require learners to work independently so that learners could build confidence through their learning process and choose whatever learning style they prefer” [8]. Moreover, “teachers should provide learners with the opportunities of having self-access to the learning materials which matched with their learning style well” [18].

#### 4. CONCLUSION

This paper discusses the influence of the matching between teaching style and learning style on academic record of English majors. The result shows that students’ academic record is pertinent to the matching or mismatching of teaching style and learning style. It has been found that the match approach is needed in “global and analytic” and “visual, auditory” dimensions. On the contrary, the mismatch approach is required in “introverted and extroverted” dimension. In “closure-oriented and open” dimension, the open type does better than the closure-oriented type. Besides, in “intuitive-random and concrete-sequential” dimension, no conclusions have been reached for lack of available data, and a further study is needed.

The research shows that the matching or mismatching between learning style and teaching style indeed influences students' academic record. Thus, more concerns should be paid on this issue. After doing the research, on one hand, it is easy to find that the match approach does not always have a positive effect. On the other hand, the mismatch approach sometimes brings benefits to both students and teachers. When formulating teaching plan, teachers should take both students' learning style and the educational objectives into account. As this research is far from being conclusive, this paper will be served as a reference for further researches.

### COMPETING INTERESTS

Authors have declared that no competing interests exist.

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