

Relationship between Iranian EFL Teachers' Brain Dominance, Teaching Experience and their Teaching Style

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Abstract

The present study sought to explore the relationship between Iranian EFL teachers' brain dominance, teaching experience and their teaching style. The study population consisted of all EFL teachers of high schools in Shiraz holding a B.A degree, with the sample consisting of 100 participants recruited through convenience sampling. The study employed a descriptive correlational design. To collect data, a 40 Item-Teaching Style Survey, a 15 Item- Brain Dominance Questionnaire, and a 14 Item-Teaching Experience Scale were used. The data was presented in mean, standard deviation, graphs, and tables. Pearson correlation coefficient and multiple regression were used to test the research hypotheses. The results showed that there was a significant relationship between EFL teachers' brain dominance, teaching experience and their teaching style. It was also found that EFL teachers' brain dominance was a grater predictor of their teaching style than their teaching experience was. The results have several practical implications. The recommendations made include whole brain teaching and addressing the cognitive needs of EFL teachers.

Keywords: EFL Teaching, EFL Teaching Style, Brain Dominance, Teaching Experience.

Introduction

There are various lines of research in the field of language learning/teaching and the mechanism of brain. The issue of language acquisition has been given a lot of attention in recent years. Some investigators have argued for the biological nature of language, while some researchers have claimed that language acquisition is an outcome of cultural transmission and socialization process. An important point to study in teaching foreign languages is the concept of hemispheric dominance. "Control over the body's functions and sensation is divided between the two hemispheres evenly, but in a crossed fashion. In other words, the left hemisphere controls the right side of the body and vice versa" (Hergenhahn & Olson, 2005, p. 394). Awareness of the characteristics of the hemispheric dominance of EFL teachers will shed light on aspects of their behavior. While the structural differences between the left and right hemispheres are not so significant, the way they function differs greatly from each other (Arul, 2012).

Left brain dominant EFL teachers are expected to rely on their logic more than their insights. Moreover, they are more detail-oriented. As reality-based instructors, they are expected to work better with truths and rules. They also have a very strong sense of time and handle orders and outlines quite well. Hence, they are expected to find it easier to explain the grammatical rules of the language. It is easy for them to remember the names of objects; therefore, they are better off with vocabulary and retention of the lexis. Finally, they can make strategies, and are practical in result solutions and always feel safe (Hergenhahn & Olson, 2005).

On the other hand, “The right hemisphere perceives and remembers visual, tactile, and auditory images; it is more efficient in processing holistic, integrative, and emotional information” (Brown, 2007, p.125). Right brain teachers are expected to be intuition-oriented and work with their hunches. Moreover, they are more fantasy-oriented and use their imagination. Nonetheless, they are not so strong with the time conception. Instead, they are better with symbols and images and work better with concrete phenomena and have a better perception of space. In sum, they have a tendency to see more of the whole than the details and to take risks (Brein-Pierson, 1988; Saleh, 1997; Gredler, 2005, p.100; Krashen, 1988).

Studies on the effectiveness of teaching practice cannot be accomplished without considering the role of people involved in it, i.e. teachers. Emergence of different approaches to language teaching led to the development of new conditions whereby specific roles and characteristics were defined for language teachers. As stated by Borg (2006), characteristics of language teachers and language teaching cannot be separated. Teaching styles, through the teaching behaviors they encompass, provide significant insights into the nature of language learning. A full understanding of teaching styles is a fundamental tool that teachers should employ to help them appreciate their learners and to form their teaching and instructional practices to improve their students’ learning experiences in schools.

Classically, teachers tend to teach as they have been taught, modeling their classroom lessons and instructional techniques on the styles and plans they have experienced in their own schooling, or observed in the schools where they are teaching (Lortie, 1975; McCann, Johannessen, Kahn, & Flanagan, 2006; Smagorinsky & Whiting, 1995). The use of both right brain and left brain help teachers develop the left brain and right brain thinking in order to use the full variety of their mental capabilities (Bielefeldt, 2006). Therefore, teachers benefit greatly from knowing their own hemispheric preferences, as it can help them to regulate their teaching style. What has not been investigated yet is the relative contribution of brain dominance as compared with teaching experience to teaching style. The issue is deemed important in light of the fact that sole reliance on one’s dominant hemisphere is highly inefficient (Cherry, 2017). As brain is a highly malleable organ, it is interesting to know whether teaching experience is related to one’s teaching style at least as strongly as one’s brain dominance is. The present study was carried out to investigate the probable existence of a relationship between brain dominance of Iranian EFL teachers, their teaching experience and their teaching style. The result of this study might give new insights to researchers.

Review of Literature

Theoretical Framework

Teaching Style

Everyone has their own preferences or styles for doing things. In fact, styles can distinguish a person from others by their impacts as an individual and differentiate him/her from someone else. Teaching style is defined as “teacher’s preferred way of solving problems, carrying out tasks, and making decisions in the process of teaching” (Fan & Ye, 2007, p. 27). According to Grasha (2002), teaching styles are a criterion for personal qualities and behaviors that control how teachers manage their classes. As a whole, it can be claimed that teaching styles consist of all teaching techniques and activities and approaches that a teacher employs in the process of teaching in the classroom or “the sum total of instructional activities, techniques, and approaches that a teacher feels most comfortable using when he or she is in front of a class” (Cooper, 2001, p. 301).

There are many theories, models, and definitions regarding teaching styles. Fischer and Fischer (1979) defined it as “a pervasive way of approaching the learners that might be consistent with several methods of teacher” (p. 246). To Kaplan and Kies (1995), teaching style “consists of a teachers’ personal behavior and the media used to transmit data to or receive it from the learner” (p. 2). In Grasha’s view point (2002), teaching style involves the continuous and constant manners of teachers in their interactions with learners during the teaching-learning process. Jarvis (2004) indicated that teaching style “includes the implementation of philosophy; it involves evidence of beliefs about, values related to, and attitudes toward all the elements of the teaching-learning exchange” (p. 40). So, teaching styles are set of approaches, activities, and techniques which a teacher uses during the time of class (Cooper, 2001). Several categorizations have been suggested for teaching styles. In the present study, Grasha’s model was used.

This model includes five components as cited by Ghanizadeh & Jahedizadeh (2016) as follows:

1) Expert: the teacher has an expert role to give correct information to learners. Actually, he/she is very knowledgeable in any field; this of course may intimidate many learners.

2) Formal authority: the teacher has a key role as school member who highlights acceptable, standard, and correct ways to do things and the learners are trained with the structures they need to learn.

3) Personal model: the teacher performs as a model and cheers learners to perceive and apply “one specific approach which is effective in teacher’s point of view” (Ghanizadeh & Jahedizadeh 2016, p. 3)

4) Facilitator: the teacher is as a leader and guides learners by “asking questions, exploring options, suggesting alternatives, and encourages them to develop criteria to make informed choices which develop the capacity for independent action, initiative, and responsibility for learners (Ghanizadeh & Jahedizadeh, 2016, p. 3). These styles can be combined in different ways.

5) Delegator: the teacher is concerned with learners’ autonomy who expects learners to work independently and help them just when it is needed.

All of these models can be mixed in different ways; as a result, a teacher could have all these styles in various degrees.

Brain Dominance

Sympathetic brain behavior has been a major part of exploring the learning and teaching process. “Investigation into an individual’s brain behavior and relating it to his performances came primarily in the form of examining functions of the various parts of the individual’s brain” (Dulger, 2012, p. 1). Studies in this area preferred several terminologies such as “brain hemisphericity, brain dominance, split brain research, hemisphere specialization research, or lateralization in the research literature” (Saleh, 2001; Baynes & Long, 2007). Clinical signs of language lateralization were obtained either through evaluating the effects of brain lesions or by inactivating one of the hemispheres at a time (the Wada test). So, the brain dominance is an attitude which supports that a brain is made by parts, hemispheres or quadrants, not equals, but asymmetric and functionally specialized and where one part is dominant relatively to the others. According to the theory of left-brain or right-brain dominance, each side of the brain controls different types of thinking. Additionally, people are said to prefer one type of thinking over the other (Cherry, 2017).

The Role of Brain Dominance in Determining Teaching style

Recent research on the hemispheres of the brain has made two different and complementary ways of processing information: a linear, step by step style that analyzes the parts that make up a pattern (in the left hemisphere) and spatial, relational style that seeks and constructs patterns (in the right). As Williams (1986, p. 7) observes, “the brain has two hemispheres but too often education system operates as though there were only one”. Making fuller use of the two sided-mind does not requires giving up books and lectures. In fact, learners need valuable teaching techniques. It merely needs teachers balance them with other techniques more appropriate to the right hemisphere (Williams, 1986). Furthermore, “practical techniques teachers can use to broaden their approaches to a subject to include both left- and right-hemisphere thinking. In fact, these techniques don’t need to be added on, they do not require that time be taken from something already in curriculum; they deal with how materials are taught not what” (Williams, 1986, p. 10). As a result, Mawer (1995) had recommendation that “effective teachers” are able to change and adapt teaching strategies in order to suit their objectives, learning outcomes and pupils’ responses.

Teaching Experience

Teaching experience is a compulsory element of all teacher education programs. In education, teacher experience is a necessary factor in personnel policies that could be affecting employees: “it is a cornerstone of traditional single-salary schedules; it handles teacher transfer policies that prioritize seniority; and it is commonly considered a major source of inequity across schools and, then, a target for redistribution” (King Rice, 2010, p. 1). According to Dewey, (2010), any experience is “miseducative” that has the effect of arresting or distorting the growth of further experience or an experience may be such as to engender callousness; it causes lack of sensibility and of receptiveness.

Empirical Studies

For many decades, global educational systems have focused mainly on left brain teaching and evaluation strategies (Boer, 2001). According to Goodlad (1994, p. 4), a critical part of multicultural education is the continuing education of educators. One important issue that appears is that a model shift needs a change in teachers’ traditional perspectives of teaching and learning (Boer, 2001).

Impact of Experience

In educational system, the experience of teachers is the key issue in personnel strategies that impact current employees: “it is a cornerstone of traditional single-salary schedules; it drives teacher transfer policies that prioritize seniority; and it is commonly considered a major source of inequity across schools and, therefore, a target for redistribution” (King Rice, 2010, p. 1). . “The impact of experience is strongest during the first few years of teaching; after that, marginal returns diminish” (King Rice, 2010, p. 1). Over 40 years of teacher productivity research suggested that the simple assumption that “more is better” requires important issues; the impacts of experience are complex and depend on a number of factors (King Rice, 2010). New evidence from CALDER studies using rich state datasets provides new insight into the effects of teacher experience (King Rice, 2010). According to this research, some factors emerged, and these findings showed they have important policy implications. “Experience matters, but more is not always better” (King Rice, 2010, p.2). According to one study from North Carolina, elementary school teachers with one or two years of experience are more effective, on average, than teachers

with no experience by 0.06 SD in math achievement, and 0.03 SD in reading achievement (King Rice, 2010). According to Dewey (2010), experience and education cannot be directly associated to each other. “For some experiences are miseducative, in fact, any experience is miseducative that has the effect of arresting or distorting the growth of further experience” (Dewey, 2010, p. 9).

Brain Dominance and Effective Teaching

The teaching activities that complement the four brain areas and teaching styles are given in Table 1 (Torio & Cabrillas-Torio, 2015, p. 61).

Table 1. Brain Areas and corresponding Teaching Activity

| Activity Set /Teaching Style | Teaching Activity |
|-------------------------------------|--|
| A. Rational-Theoretical | Lecture, discussion and learning from the textbook |
| B. Ordered, Safekeeping | Manual work individually |
| C. Imaginative, Experimental | Experimentation, Cooperative Learning Group |
| D. Emotional, Interpersonal | Practical Displays by the Teacher |

Educators and researchers have identified learning-style assessment techniques to examine different ways in which teachers and learners learn. So, educators have traditionally used these assessment techniques to try to understand the different ways of approaching teaching and learning (Todorovich, 2013). In fact, realizing how dominance patterns (left or right) affect teaching helps teachers to be more effective. Stevens-Smith (2009) determined the dominance patterns (i.e., right or left brain hemispheres, eye, ear, hand, and foot) of educators. Eyes, ears, hands and feet are all mechanisms for transporting information to the brain. Barbe and Milone (1981) found that teacher’s instruction most often match their predominant learning style. “Many teachers are not aware of their own dominant learning preferences, so they simply teach the same way in which they were taught as students” (Stevens-Smith, 2009, p. 40). In fact, finding an appropriate system to control learning strengths and weaknesses is necessary if one needs to use dominant preferences (Stevens-Smith, 2009). “Dominance profiles” are simply preferences developed for survival and the completion of certain tasks. These preferences are what enable us to be unique in our teaching/learning abilities (Stevens-Smith, 2009). According to Hereupon, and Morris (2005), brain is divided to four different classifications with different preferred styles as follows:

- A: Left cerebral hemisphere—analytical
- B: Left limbic system—sequential
- C: Right limbic system—interpersonal
- D: Right cerebral hemisphere—imaginative

Research Questions

This study dealt with two research questions as follows:

1. Is there a statistically significant relationship between Iranian EFL teachers’ brain dominance and their teaching style?

2. Is there a statistically significant relationship between EFL teachers' teaching experience and their teaching style?

Method

Design of the study

This study employed an ex-post facto design to explore the relationship between Iranian EFL teachers' brain dominance, teaching experience and their teaching style.

Participants

The participants in the present study were 100 Iranian EFL teachers (50 males and 50 female), who taught at the Shiraz high schools selected through convenience sampling. The age of the participants ranged from 24 to 50 years.

Instruments

To measure the variables of the research, the following scales were used:

Grasha's Teaching Styles Questionnaire

To determine the EFL teaching Style, Grasha's Teaching Styles Questionnaire (1996) was used in this study. This questionnaire consists of 40- Likert scale items to which the respondents respond with numbers 1 (strongly disagree) through 5 (strongly agree). Mean score ranges for each of the sets of items related to the individual teaching styles are calculated, and the mean scores are categorized as either low, moderate, or high where high corresponds to a preferred teaching style (based on the standards developed by Grasha, 1996). The scale has an acceptable reliability index ($\alpha = .68-.75$ on individual scales, and $\alpha = .72$ for the entire test). The scale also enjoys an acceptable level of validity (Grasha, 1996).

Brain Dominance Questionnaire

The researchers also used the Brain-Dominance Inventory developed by Davis, Nur, and Ruru (1994), which consisted of 39 Likert scale statements with three alternatives for each statement to measure the degree of left/right brain dominance of the participants. According to Khabiri & Heidari (2011), "The questions are based on the findings of neuropsychologists and neurologists and each question taps on a behavioral or cognitive characteristic of the respondent" (p.62). The reported reliability of this instrument is 0.75 (Khabiri & Heidari, 2011).

Teaching Experience Questionnaire

The third instrument used in this study is Teaching Preference Questionnaire originally developed by Iwasiw and Golednberg (1993). The test-retest reliability of this questionnaire is reported to be 0.73 (Iwasiw and Golednberg, 1993). Teaching experience questionnaire consists of 14 statements on a 5-point Likert response format (1= strongly disagree, and 5= strongly agree).

Procedures

Data Collection

The researchers passed through the following steps to achieve the results of the study: Davis, Nur, and Ruru's (1994) Brain-Dominance Inventory, Teaching Experience Questionnaire (adapted from Iwasiw and Goldenberg, 1993) and Grasha's (1996) Teaching Style Questionnaire

were administrated to the participants in their work places during normal office hours by the researchers in person. To ensure their cooperation, the participants had been already contacted via phone to request their cooperation. The participants were asked to complete the questionnaires and return them within a week. Token gifts i.e., flowers and candies, were also handed to the participants as a token of appreciation. The process was completed in a month.

Data Analysis Procedures

In order to analyze the data, Statistical Package for Social Sciences (SPSS) software version 23 was used to test the research hypotheses. Data analysis procedures included two parts: descriptive statistics (mean, median, and standard deviation) and inferential statistics (Pearson product moment correlation and multiple regression).

Results

Descriptive Statistics

The first set of analyses included the frequency analysis of the descriptive information obtained from the questionnaires, which reflects mean, median, and standard deviation. Table 2 presents descriptive information such as mean, median and standard deviation. As it can be understood from this table the average value of EFL teachers' teaching style was the lowest mean among aforementioned independent variables (2.25). The median of this variable had the lowest value among independent variables (2.33). Also, the mean value of EFL teachers' brain dominance had the highest mean among independent variables (3.76). As can be seen, teaching experience had the lowest value of standard deviation (0.35). EFL teachers' brain dominance had the maximum value of standard deviation (0.87). Moreover, mean, median, and standard deviation of EFL teaching styles were measured as (3.55, 3.65, and 0.098).

Table 2. *Descriptive Statistics of Brain Dominance, Teaching Styles and Teaching Experience of Iranian EFL Teachers*

| Variable | Mean | Median | SD |
|----------------------------|-------------|---------------|-----------|
| Brain Dominance | 3.76 | 3.80 | 0.87 |
| Teaching Style | 2.25 | 2.33 | 0.35 |
| Teaching Experience | 3.55 | 3.65 | 0.98 |

Inferential Statistics

Relationship between Brain Dominance and Teaching style

In this case, the researchers investigated significant relationship between brain dominance and teaching style. For this purpose, the researchers used the Pearson correlation coefficient to test hypothesis one.

Table 3. *Pearson Correlation Test between EFL teachers' brain dominance and their teaching styles*

| | | Brain Dominance | Teaching Style |
|------------------------|----------------------------|------------------------|-----------------------|
| Brain Dominance | Pearson Correlation | 1 | .425 ** |

| | | | |
|----------------|---------------------|---------|------|
| | Sig. (2-tailed) | | .001 |
| | N | 100 | 100 |
| Teaching Style | Pearson Correlation | .425 ** | 1 |
| | Sig. (2-tailed) | .001 | |
| | N | 100 | 100 |
| | | | |

** . Correlation is significant at the 0.05 level (2-tailed).

Table 3 provides the Pearson correlation values of brain dominance and teaching style. According to the results, r is significant at the 0.001 level, which is less than the alpha level of 0.05. Therefore, the obtained results of Pearson correlation show that there is a statistically significant relationship between EFL teachers' brain dominance and their teaching style ($r = .425$, $p < .05$). Subsequently, the first null hypothesis of this study was rejected.

Relationship between Teaching Experience and Teaching style

For this purpose, the researchers used Pearson Correlation Coefficient to check the relationship between teaching experience and teaching style.

Table 4. *Pearson Correlation Test between EFL teaching experience and their teaching style*

| | | Teaching Experience | Teaching Style |
|---------------------|---------------------|---------------------|----------------|
| Teaching Experience | Pearson Correlation | 1 | .324** |
| | Sig. (2-tailed) | | .001 |
| | N | 100 | 100 |
| | | | |
| Teaching Style | Pearson Correlation | .324** | 1 |
| | Sig. (2-tailed) | .001 | |
| | N | 100 | 100 |
| | | | |

** . Correlation is significant at the 0.05 level (2-tailed).

Table 4 provides the Pearson correlation values of teaching experience and teaching style. According to the results, r is significant at the 0.001 level, which is less than the alpha level of 0.05. Therefore, the obtained results of Pearson correlation show that there is a statistically significant relationship between EFL learners' teaching Experience and teaching Style ($r = .324$, $p < .05$). Subsequently, the second null hypothesis of this study was rejected.

Regression Model

The regression analysis enables researchers to predict the value of the dependent variable Y from that of the independent variable X . Thus, to determine to what extent the two independent variables, namely, brain dominance and teaching experience could predict the variance in the dependent variable, namely, teaching styles, multiple regression was run.

Table 5. *Results of ANOVA for Testing Linearity Assumption between the Variables of the Study*

| Model | Sum of Squares | Df | Mean Square | F | Sig. |
|------------|----------------|----|-------------|--------|-------|
| Regression | 5.071 | 2 | 2.536 | 11.733 | 0.001 |

| | | | |
|------------------|--------|----|-------|
| Residuals | 20.963 | 97 | 0.216 |
| Total | 26.034 | 99 | 2.752 |

According to the results from table 5, F- statistic is significant (sig) at 0.001 level, which is less than the error value of 0.05; therefore, it is concluded that the regression is linear.

Test of the Significance of the Regression Coefficients

To test the significance of the regression coefficients, the significance level of standardized and unstandardized coefficients were calculated.

Table 6. *Standardized and Unstandardized Coefficients for Independent Variables in the Regression Model*

| Model | Unstandardized Coefficients | | Standardized Coefficients | T | Sig. |
|----------------------------|------------------------------------|------------|----------------------------------|----------|-------------|
| | Estimated coefficient(B) | Std. Error | Beta | | |
| Constant | 2.884 | 0.472 | - | 6.109 | 0.001 |
| Brain Dominance | 0.274 | 0.075 | 0.352 | 3.291 | 0.001 |
| Teaching Experience | 0.129 | 0.098 | 0.265 | 1.315 | 0.001 |

Table 6 shows that *t*- statistic values are significant (sig) at 0.001 level, which is less than the error value of 0.05. Therefore, it is concluded that regression coefficients are significant. In addition, the *t*-statistic value is 3.291 for brain dominance and 1.315 for teaching experience. Therefore, it is concluded that brain dominance can predict the teaching style of Iranian EFL teachers with a beta value of 0.352. In other words, one standard deviation increase in brain dominance will result in an increase of 0.274 in the standard deviation of teaching style. Likewise, teaching experience can predict teaching style of Iranian EFL teachers, though with a beta value of 0.265. In other words, one standard deviation increase in teaching experience will result in an increase of 0.129 in the standard deviation of teaching style. Therefore, it is concluded that brain dominance contributes more to teaching style than teaching experience does. The regression formula could be presented as follows:

$$Y = 2.884a + 0.129b$$

Y is teaching style, a teaching experience, and b brain dominance.

Discussion

To interpret the results the researchers examined whether teaching style was related to brain dominance on the one hand and teaching experience on the other. A comparison between the strength of the relationship between brain dominance and teaching experience with teaching style will be illuminating as their contribution to teaching style makes a difference. The result is two-fold: though both brain dominance and teaching styles were predictors of teaching style, the former made a greater contribution than the latter. The researchers find the result a bit alarming for two reasons: First, the truth is that it would be highly inefficient for one half of the brain to consistently be more active than the other. Indeed, it has been argued that in stressful situations, individuals go more deeply into their dominant hemisphere. That is to say, if they are right-

brained dominant, under stress they will have even less access to the left or logical, sequential hemisphere (Coffield, Moseley and Ecclestone, 2004). Second, to be consistently right-left brain dominated means that the teachers are not capable to meet their pupils' cognitive needs. After all, though students use every part of their brain in the learning process, and none are strictly "right brain only" or "left brain only," most of them are either left brain dominant or right brain dominant – meaning not every teaching style completely fits their teaching style preferences (Cherry, 2017). Nonetheless, given the fact that the brain is remarkably malleable, even into late adulthood, it is expected that teaching experience would make contribution to teaching styles as well. This was indeed the case though to a lesser degree.

The previous studies indicated that brain dominance had impact on the method of teaching. According to Boer (2001), "traditional teaching methods are no longer effective because brain dominance leads to the development of preferences which in turn establish specific interests" (p. 125). Such interests conduce to the growth of abilities and affect career choice. In fact, according to Boer (2001), providing learners with a verity of teaching methods with a focus on the same key points can facilitate effective learning. Brain processing influences all other preferences and styles of the person (Prashnig, 2001). According to Arul (2012), there is a significant difference between the brain dominance of female high school teachers versus male teachers. The result of study by Rahimi and Asadollahi in 2012, indicated that Iranian EFL teachers employ all eight types of teaching styles in their language classes.

The data analysis also revealed that there was relationship between teaching experience of adult EFL learners and their teaching style. Moreover, teaching experience can predict the teaching styles of EFL teachers. Both Brain dominance and teaching experience were shown to have a significant effect on teaching style. Yet, brain dominance had the greatest impact on EFL teaching style. The use of different teaching activities by Iranian EFL teachers are a promising finding that supports teachers' role in creating an effective learning environment (Sarvan & Cakiroglu, 2003) even in an EFL program that suffers a lot of serious problems including teaching materials and methodology (Rahimi & Nabilou, 2009).

Conclusion

The obtained results from the Pearson correlation analysis revealed there was a statistically significant relationship between EFL teachers' brain dominance and their teaching style. Subsequently, the first null hypothesis of this study was rejected. Moreover, the results from the regression analysis indicated that brain dominance can predict the teaching style of the Iranian EFL teachers. The results also showed that there was a statistically significant relationship between EFL teachers' teaching experience and their teaching style. Subsequently, the second null hypothesis of this study was also rejected. Moreover, the results from the regression analysis indicated that both brain dominance and teaching experience can predict the teaching style of the Iranian EFL teachers. Nonetheless, the contribution of brain dominance to teaching style is more than that of teaching experience.

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