

The correlation between learning styles and self-directed learning of fifth graders

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ABSTRACT

Vietnam education has been directed into a learner-centered approach and fostering competencies for students, especially self-directed learning. Thus, understanding how students' learning styles impact self-directed learning are crucial for the new direction of Vietnam education. This research employed the survey method by questionnaire and presents the results of practical research on the correlation between styles of learning and self-directed learning of fifth-grade students at elementary schools in District 10, Ho Chi Minh City, Vietnam. The sample was 364 fifth graders voluntarily participating in the survey with the consent of parents. The results indicated that learning styles are strongly correlated with self-directed learning competency of fifth graders. The data revealed that students at District 10 not only attained high self-directed learning levels but also their learning styles attributing impactfully on their self-directed learning competency.

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1. INTRODUCTION

In the Vietnamese education direction issued in 2013 by resolution 29 by Vietnam's Ministry of Education and Training, self-directed learning became an outcome competency. Studying elementary schoolers in terms of self-directed learning would give researchers, headteachers, and teachers chances for understanding more about the capacity of elementary students and suggestions for adapting new approaches in teaching. However, most of the research conducted in Vietnam was focused on university students since self-directed learning was conceived as a concept for adult learning. In this study, we aimed to investigate on the level of self-directed learning of fifth-grade elementary schoolers in District 10, Ho Chi Minh City. The novelty was that self-directed learning was conceived in terms of younger learners' perspectives. Moreover, the research also reveals correlation between self-directed learning and the learning styles amongst fifth pupils. In terms of learning styles, there was a limited number of researchers working on this approach and how it correlates to self-directed learning in Vietnam. According to Toth [1], knowledge of learning styles is an assistance for students to select the most suitable learning strategy and to contribute to developing self-directed learning. Besides that, understanding learning style and self-directed learning would promote the application of a learner-centered approach in education [2]. Thus, studying about learning styles of students and how they would leave their impacts on self-directed learning is crucial and unprecedented in Vietnam.

The concept of learning style refers to how people like to learn or learn in the way that feels most effective for them [3]. According to Reid [4], learning styles was stated as changes within pupils in utilize senses to acknowledge, organize, and retain studying experiences. Learning style is a natural, habitual, and

preferred methods to acquire, process, and retain added information and skills [5]. In this research, the definition of learning style by Reid [5], was administrated. Learning styles include six diverse types of styles: Visual learning style, auditory learning style, tactile learning style, group learning style, kinesthetic learning styles, individual learning styles [5].

As far as the research could reach, self-directed learning was stated as a dynamic personal procedure [6]–[12], in which people either have or do not have assistance from others in comprehending education needs [8], [11], self-identifying aids to learn [12], self-select and execute proper learning plans [11], [12], and assess educating results. Besides that, researchers supported the theory of self-directed learning and stated that self-directed learning is a mental authority, the similar consequence of individual psychology and pedagogical psychology includes self-control, motivational necessities, resource designation method [7]–[9], reliable for education and learners themselves [10], not necessarily taken place in classroom conditions, diverse circumstances and majors [11]. Self-directed learning includes self-management, self-monitoring, self-motivation [12]. In brief, intellectuals donated exhaustively self-directed learning.

Vietnamese intellectuals have stated sentiments on self-directed learning. Self-directed learning was first mentioned as brainstorming by oneself, using one own scholarly capabilities (such as monitoring, resembling, diagnosing, synthesizing) and sometimes even muscles ability such as when you have to use tools) with subjective qualities, inspirations, sensations, a worldview to populate one space, grasping a certain field or knowledge of humanity, constructing it one own [13]–[17]. In addition, intellectuals have presented self-directed learning such as an individual mental exercise [18], conducted outside the classroom and imbued with individual identity [19], the perception and application of knowledge in new standings [20], [21]. In the coverage of this research, self-directed learning was administrated [6].

The consequence of learning styles on self-directed learning has not been investigated extensively. Nevertheless, the investigations on this facet have raised a two-way association between learning styles and self-directed learning in learners. O’Kell [22] analyzed the association between learning styles and self-directed learning by involving Kolb’s learning style scale [23] and Guglielmino’s self-directed learning scale. The analysis sample was 158 students. A robust correlation between self-directed learning and learning style was found in previous study [22]. Furthermore, transformational learning styles and assimilation learning styles were found to be strongly correlated with self-directed learning [22].

Adenuga [24] studied the connection between self-directed learning and the learning style at Iowa State University. The study used the learning style scale of Kolb’s [24], and the scale of Guglielmino [25]. The Cronbach Alpha index of the self-directed learning scale in the research was 0.87, and of the learning style scale was 0.8. The sample was three hundred students. The results revealed that learning style and self-directed learning have a strong two-way correlation. Moreover, the transformational learning style was found to be strongly correlated with self-directed learning. Research also showed that the integrated learning style was the most appropriate for developing learners’ self-directed learning.

Kaur, Lakra, and Kumar [26] explored the affinity between self-directed learning and learning styles. The sample was 121 people with previous researchers’ scale [24], [27]. After research was conducted, there was a strong correlation between learning style and self-directed learning in learners found. Moreover, the self-control component in self-directed learning had a strong correlation with the learning style.

2. RESEARCH METHOD

2.1. Sample

The study was conducted at three elementary schools in District 10, Ho Chi Minh City (Le Thi Rieng Elementary School, Ho Thi Ky Elementary School, Trieu Thi Trinh Elementary School). The research area was selected on the recommendation of teachers of the three elementary schools mentioned for facilitating research. The total number of fifth graders in District 10, Ho Chi Minh City in 2020-2021 academic year was about 3,540 students. This study adhered the sample size calculation formula [28]. Hence, it determined that the sample size for this study ranged from 353 to 364. The survey sample was 364 fifth-grade pupils who voluntarily participated in the survey. The pupils voluntarily experienced the survey with the permission of their parents and instructors. The study period was from January 2021 to June 2021.

2.2. Instruments

This study used the learning style scale [5] to assess the learning style of pupils in District 10, Ho Chi Minh City, the self-directed learning scale [29], a version of Bhandari [30], and learning styles scale [3]. Learning style is change within the learners when one or more methods are used to understand, organize, and experience [4]. The scale has been modified in 1984, 1987. In this study, the scale of 1987 version was implemented. The reason for not administrating the scale of Kolb [24] was that the scale mostly built to measure university student, while the object of the research is fifth graders. On contrary, Reid scale [5],

comes from the study of English learning styles of learners with different age levels and scale lengths. Moderately, the language used in Reid's scale is simple and suitable for the younger pupils. Reid's learning style scale [5], includes 30 questions comprising six distinctive styles, rated on a 5-point Likert scale. This scale was the first Vietnamization and compatible with the Vietnamese context, we did a pilot study with 50 fifth-grade pupils to check the reliability, validity, and analysis of factors of the test break with scale.

Cheng *et al.* [31] developed the scale of self-directed learning in Taiwan based on the theory of Knowles [6]. The scale was a set of 20 questions (items) comprising four aspects: learning motivation, planning and implementation, self-control, interpersonal [31]. Open-ended questions are scored from 1 (Completely disagree) to 5 (Totally agree). The Cronbach Alpha index for the entire scale was 0.916 and for each aspect of self-directed learning was 0.801, 0.861, 0.785, and 0.765 respectively. The scoring method was to calculate the total score of the scale, ranging from 20 to 100 points, in which the average score of each aspect will tell the level of competence of each aspect of the survey takers. However, this scale had been modified and was compatible with previous studies [29], [30]. In the Bhandari scale [30], the Cronbach Alpha index after being compatible and adjusted to suit the times, was greater than 0.7 with three aspects instead of four aspects like previous researches [29], [31]. Bhandari, Chopra, and Singh [30] included self-management in planning and implementation. The order of questions of Bhandari [30] was like that of previous studies [29], [31]. In this study, the version of the scale of Bhandari [30] was implemented. The scoring method of this scale was taken according to the average value, the average score reflected the frequency of pupils' assessment of the manifestations of self-directed learning. Accordingly, the higher the average score will be the better the student's self-directed learning and vice versa.

2.3. Pilot research

The scale of self-study capacity [30] was also Vietnam seized and compatible with the Vietnamese social context, psychophysiological characteristics of elementary schoolers. The scale was put into a pilot study with a sample of 50 elementary students in aim to evaluate reliability and validity. The Cronbach Alpha result of the self-directed learning scale was 0.841. In which, there were three items with the total variable correlation result 0.3. The Kaiser-Meyer-Olkin (KMO) test for the scale after removing three items gave the results Bartlett's Test was $0.00 < 0.05$, showing that the observed variables correlated with each other in the group of factors. The total variance extracted was $55.168\% > 50\%$, Eigenvalue = $1.135 \geq 1$ and three factors were extracted with the best information summary meaning. Thus, the scale after Vietnamized retained 17 items out of 20 items representing three factors [30]. The learning style scale of Reid [5], was Vietnamized by us to be compatible with the Vietnamese social context, psychophysiological characteristics of elementary schoolers. The scale was put into a pilot study with a sample of 50 elementary schoolers to assess the reliability and validity of the scale. The Cronbach Alpha result of the learning style scale was 0.788.

3. RESULTS AND DISCUSSION

3.1. Cronbach alpha and exploratory factors analysis

The scale has been conducted a survey with the sample of 367 elementary school students in grade 5 at elementary schools. The results of evaluating the reliability and validity of the scale in the official study for the Cronbach Alpha index of the whole scale were 0.921. The KMO test gave the scale results, the KMO index was 0.923, Bartlett's Test sig index was $0.00 < 0.05$, showing that the observed variables were correlated with each other in the factor group. The total variance extracted was $59.168\% > 50\%$, Eigenvalue = $1.129 \geq 1$ and extracted three factors with the best information summary meaning. To assess the reliability and validity of the scale, the research was conducted with 367 elementary schoolers. The total Cronbach Alpha index result was 0.901, the Cronbach Alpha index for tactile learning style was 0.78, auditory learning style was 0.825, 0.735 for group learning style, 0.811 for individual learning styles, 0.823 for learning through kinesthetic, 0.802 for visual learning style. The total variable correlation of the scale was greater than 0.3, so the scale met the requirements for reliability. The Kaiser-Meyer-Olkin test gave the KMO index of 0.865, the Sig index of Bartlett's Test was $0.000 < 0.05$, revealed that variables were correlated with each other. Eigenvalue of 1.3 stopping at 6 factors was appropriate. The total variance extracted was $58.394\% > 50\%$, showing that the exploratory factor analysis (EFA) model was suitable. The research's result of Cronbach's Alpha analysis and EFA revealed that the scale was good enough for conducting further research.

3.2. Learning styles of respondents

The results showed that fifth graders' dominant learning style as shown in Table 1 was the auditory learning style (sum=19.11, standard deviation 4.13). Besides that, according to Reid [3], the sub-learning style of fifth graders was a learning style with scores from 12.5 to 18.5. The results also indicated that all the remaining learning styles were sub-learning styles of students in fifth grade elementary schools. In which, group learning style (sum score=18.05, standard deviation=3.96) was the major sub-learning style, followed

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by tactile learning style (sum score=18.01, standard deviation=4.07), kinesthetic learning style (sum score 17.75, standard deviation=4.08), visual learning style (sum score 16.91, standard deviation 4.39) and finally individual learning style (total score=14.37, standard deviation 4.82). Independent T-test shows that there was no difference between male and female students in learning styles (significant level $p>0.05$).

Table 1. Learning styles of respondents

Learning styles	Genders		Sum Sum (Std. D)	F
	Male Sum (Std. D)	Female Sum (Std. D)		
Tactile learning styles	18.02 (4.3)	18.01 (3.8)	18.01 (4.07)	4.811
Auditory learning styles	19.28 (4.03)	18.92 (4.23)	19.11 (4.13)	1.014
Group learning styles	18.27 (3.9)	17.89 (4.01)	18.05 (3.96)	0.127
Individual learning styles	14.74 (4.89)	13.95 (4.72)	14.37 (4.82)	0.241
Kinesthetic learning styles	17.80 (4.28)	17.69 (3.86)	17.75 (4.08)	4.664
Visual learning styles	17.22 (4.32)	16.56 (4.46)	16.91 (4.39)	0.005

Note: ** when $p<0.05$

3.3. Self-directed learning of respondent

The average score of self-directed learning of respondent was 4.00. Hence, the average score of self-directed learning of male students was 3.97 and that of female students was 4.03. Thus, the self-directed learning of respondent was quite high. In addition, the Independent T-test shows that there was no difference between boys and girls (significant level $p>0.05$).

3.4. Correlation between learning styles and self-directed learning of respondent

Pearson test in Table 2 shows that learning styles were strongly correlated with self-study ability (Pearson index varies from 0.316 to 0.544 with significance less than 0.001). Besides that, the first-order regression analysis showed that the audio learning style explained the most change (29.4% with $\text{Sig}<0.005$) in the self-directed learning of fifth graders. In addition, there was a group learning style, which explains 24.1%, and a kinesthetic learning style which explains 22.5% (all Sig scores=0.000<0.005). Individual learning styles explained the least change in fifth graders' self-directed learning with 9.8% of the change ($\text{Sig}=0.000<0.05$).

Table 2. Correlation between learning styles and self-directed learning

Learning styles	Self-directed learning	
	Correlation index (r)	Correlation coefficients r^2
Tactile learning styles	0.467**	0.216***
Auditory learning styles	0.544**	0.294***
Group learning styles	0.493**	0.241***
Individual learning styles	0.316**	0.098***
Kinesthetic learning styles	0.477**	0.225***
Visual learning styles	0.392**	0.151***

Note: ** when $p<0.05$ and *** when $p<0.005$

Stepwise multiple regression analysis illustrated in Table 3 shows four optimal predictive models in which the model that can explain the least change in self-directed learning is model 1 (audio learning style), which explains 29.4 % of changes in self-directed learning of fifth graders. The model which explains the change of self-directed learning best was model 4 (Auditory learning style, kinesthetic learning style, group learning style and tactile learning style) explained 46.7% of the changes in self-directed learning of fifth graders. From the analysis results of Multiple regression mentioned, it can be built equations to forecast the change in expression of self-directed learning of fifth graders. For example, with model number 4, self-directed learning=1.239+0.361 (auditory learning styles) + 0.239 (kinesthetic learning style) + 0.198 (Group learning style) + 0.139 (tactile learning style). In model, the auditory learning style has the strongest impact ($\text{Beta}=0.361$) and the kinesthetic learning style has the weakest impact ($\text{Beta}=0.139$) on the self-directed learning of fifth graders.

According to Table 3, the impact model could be represented as Model 1 (with variables as auditory learning styles); Model 2 (with variables as auditory learning styles, kinesthetic learning styles); Model 3 (with variables as auditory learning styles, kinesthetic learning styles, grouping learning styles); or Model 4 (with variables as auditory learning styles, kinesthetic learning styles, group learning styles and tactile learning styles). The results indicated that self-directed learning of pupils was in high level. In addition, both male and female students show that they had high average scores in factors of learning motivation, learning

strategies, and planning. The results of this study were quite good compared to the same scale used in other Asian countries. Compared with the research of Bhandari, Chopra, and Singh [30], the results showed that the average score of self-directed learning ranged from 4.70 points to 3.74 points. This difference may come from differences in objective factors such as social and cultural context, and the development of education in each country. In addition, at elementary school age, communication capacity was still limited due to characteristics of the children at elementary schooling age when they are still playful, do not really have attachments and interest in learning. The dominant learning style of elementary school fifth graders was the auditory learning style, besides, group learning and kinesthetic also account for a high proportion of children's learning style. The results were linked with the psychophysiological characteristics of elementary school children. According to previous studies [32]–[35], Vietnamese fifth graders have psychological characteristics like thinking by shapes, colors, sounds, and emotions in general. Elementary school students are highly active, interested in new things but quickly bored [32]. Children are easily distracted when teachers use monotonous teaching methods or do not encourage students to participate. Therefore, teachers need to use a variety of teaching methods, in which special attention is paid to interactive teaching activities between teachers and students - the teaching environment, focusing on group teaching methods.

Table 3. Models predicting the influence of learning styles on self-directed learning

Models forecast influence of learning styles on self-directed learning		Beta	Level of significance p
Model 1: $r^2=0.294$; constant = 2.354; $p<0.001$			
1	Auditory learning styles	0.544	0.000
Model 2: $r^2=0.408$; constant = 1.645; $p<0.001$			
1	Auditory learning styles	0.447	0.000
2	Kinesthetic learning styles	0.353	0.000
Model 3: $r^2=0.456$; constant = 1.330; $p<0.001$			
1	Auditory learning styles	0.377	0.000
2	Kinesthetic learning styles	0.276	0.000
3	Grouping learning styles	0.250	0.000
Model 4: $r^2=0.467$; constant = 1.239; $p<0.001$			
1	Auditory learning styles	0.361	0.000
2	Kinesthetic learning styles	0.239	0.000
3	Grouping learning styles	0.198	0.000
4	Tactile learning styles	0.139	0.000

Dependent variable: Self-directed learning

4. CONCLUSION

In brief, the results indicated that fifth grade students already attained high level of self-directed learning. Thus, the new education policy on fostering self-directed learning of Vietnamese government would be deployed without any obstacle in term of teaching fifth grader students. However, the results also suggested that educators, headmasters and teachers should pay attention on fifth graders' learning, since there was a correlation between learning styles and self-directed learning. Teachers are advised to be fostering self-directed learning competency at their students throughout students' ways of learning. The headmasters of elementary school also deployed planning not only for fostering teaching plans for nurturing self-directed learning but also learning styles in fifth grade students.





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