

## The Effect of Agricultural Students' Learning Styles on Academic Performance

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### **Abstract**

*The main purpose of this study was to investigate the effect of agricultural students' learning styles on academic performance. The statistical population included agricultural senior students in Colleges of agriculture at Tehran University, Iran. A sample of 124 students was selected by using random sampling method. A questionnaire was used to collect data. The Group Embedded Figures Test (GEFT), a standardized test, was applied to assess the preferred learning style of agricultural students as either field-dependent or field-independent. In addition, students' grade point average at the completion of the junior academic year was applied to measure academic performance of students. Descriptive and inferential statistics were used for data analysis. The findings revealed that more than half of the male students preferred field-independent learning style. Among female students, about half of the students preferred field-dependent learning style and the rest preferred field-independent learning style. The comparison of agricultural students' learning style scores by gender indicated that the male students' learning style mean score was significantly higher than the female students' learning style mean score. Agricultural students' academic performance in relation to learning styles indicated that the GPA for students with field-independent learning style was significantly higher than the GPA for students with field-dependent learning style.*

**Keywords:** Learning Style, Student, Academic Performance, Field-dependent, Field-independent, Agriculture.

### **INTRODUCTION**

Today's society is facing a revolution where technology and information are constantly changing. This society is requiring that the workforce continually gain new knowledge to remain productive <sup>[19]</sup>. So it is clear that someone who has learned how to learn will be a productive member of the workforce.

Learning is a cognitive activity that involves the use of intellect for the development and structuring of understanding about oneself and the world in which one lives. Learning is a continuous process of organizing and reorganizing what is known and believed to be true on the basis of new evidence <sup>[20]</sup>. Learning process occurs within the individual, and during this process numerous factors influence that one of them is learning style.

Learning style can be described as a combination of factors characterized by cognitive, affective, and psychological <sup>[9]</sup> that determine the way of learning preferred by an individual <sup>[1]</sup> in which individual take-in, retain, process, and recall information <sup>[14]</sup>.

A number of researchers have initiated over the years on the issue of learning styles. Various learning style models have been forwarded by researchers working in this field of research. Among them are field-dependent and field-independent learning styles <sup>[21, 10, 16, 15, 18, 3, 13, 17, 12]</sup>.

The Group Embedded Figure Test (GEFT), a standardized test, can be used to determine the preferred learning style of learners as either field-dependent or field-independent <sup>[23]</sup>.

A person whose mode of perception is strongly dominated by the surrounding field is said to have field-dependent learning style. In contrast, a person who perceives objects separate from the surrounding field is said to have field-independent learning style <sup>[22]</sup>.

Individuals with field-dependent learning style tend to view concepts globally, need more explicit instruction in problem-solving, tend to favor the “spectator approach” for learning, are extrinsically motivated, and are socially oriented [10, 22, 16]. Conversely, individuals with field-independent learning style tend to view concepts more analytically, rely on self-defined goals and self-structured situations, tend to favor “inquire” and independent study, are intrinsically motivated, and prefer competition [10, 22, 16].

Learning style is an important factor in several areas such as move to improve curricula [6], how teachers teach and students learn, interaction between teachers and students [21], academic performance of students [21, 6, 10], and career planning [8]. Knowledge of learning styles will help faculties to be more insightful about how to adapt instruction to students’ learning styles. In addition, knowledge of students’ learning styles is a key factor for college counselors to aid students in career planning. Dembo [8] mentioned that students preferring field-independent learning style will tend to favor occupations where there is less emphasis on interpersonal interaction, while students preferring field-dependent learning style will tend to choose occupations that require involvement with others.

Different studies have focused on investigating the relationship between agricultural students’ learning styles and performance in agriculture courses [11], academic performance as measured by grade point average [21, 18, 13, 12], and overall success in higher education [2, 7, 4]. These studies revealed that when learning styles were considered in teaching and learning process, students’ performance was enhanced.

While recognition of agricultural students’ learning styles has massive benefits and implications for college admissions and for faculties who make decisions about learning environments [5], there is the need to understand learning styles of agricultural students in order for colleges and individuals to benefit.

The main purpose of this study was to investigate the effect of agricultural students’ learning styles on academic performance. The specific objectives of the study were to investigate:

- Personal characteristics of agricultural students at Tehran University, Iran;
- The preferred learning style of agricultural students as measured by the Group Embedded Figures Test (GEFT);
- Agricultural students’ academic performance in relation to learning styles.

## **MATERIALS AND METHODS**

### **Population and Sample**

The statistical population of this study included all agricultural senior students at Tehran University, Colleges of agriculture, in the spring of 2007. A sample of 124 students was randomly selected by using random sampling method.

### **Instrumentation**

The Group Embedded Figures Test (GEFT) developed by Witkin et al [23] was applied to assess the preferred learning style of students as either field-dependent or field-independent. The possible range of scores on the GEFT is zero to 18. Individuals scoring 11.4 or less were considered to prefer field-dependent learning style. In contrast, individuals scoring greater than 11.4 were considered to prefer field-independent learning style. The GEFT is a standardized instrument and validity and reliability of the GEFT was established by the authors of the instrument. The validity of the GEFT was established by determining its relationship with its “parent” test, Embedded Figures Test (EFT), as well as the Rod and Frame Test (RFT), and the Body Adjustment Test (BAT). The reliability coefficient for the GEFT was .82 [23].

In addition, academic performance of agricultural students was measured by grade point average (GPA) at the completion of the junior academic year.

### Analysis of Data

Analysis of data was done in two sections, descriptive and inferential statistics. Statistics such as frequency distribution, percentage, mean, and standard deviation were used in the descriptive section. t-test was used in the inferential analysis section. In applying these statistical techniques, version 11.5 of the Statistical Package for Social Science (SPSS) was used.

## FINDINGS AND DISCUSSION

### Personal characteristics of respondents

Personal characteristics of respondents are shown in table 1. About 43.5% of the students were male and 56.5% were female. More than half of the students (65.3%) were between the age of 23 and 25 years, and 76.6% were single.

Table 1  
Personal characteristics of respondents (n= 124)

Personal Characteristics		Frequency	%
Gender			
	Male	54	43.5
	Female	70	56.5
Age (year)			
	< 23	27	21.8
	23-25	81	65.3
	> 25	16	12.9
Marital Status			
	Single	95	76.6
	Married	29	23.4

### Preferred learning style of agricultural students

A gender analysis (Table 2) indicated that among male students, 29.6% preferred field-dependent learning style, while 70.4% preferred field-independent learning style. Among female students, 52.9% preferred field-dependent learning style and the rest (47.1%) preferred field-independent learning style.

An analysis of the overall GEFT scores indicated that 42.7% of agricultural students preferred field-dependent learning style and 57.3% of them preferred field-independent learning style.

Table 2  
Preferred learning style of agricultural students by gender (n=124)

Gender	Field-Dependent		Field-Independent		Total	
	Frequency	(%)	Frequency	(%)	Frequency	(%)
Male	16	29.6	38	70.4	54	43.5
Female	37	52.9	33	47.1	70	56.5
Total	53	42.7	71	57.3	124	100.0

Agricultural students' learning style scores were compared by gender (Table 3). It was found that the male students' learning style mean score (mean = 12.92) was significantly higher than the female students' learning style mean score (mean = 10.84). This result is accordant to the

preliminary norm data on GEFT, in which college males performed significantly higher than college females <sup>[23]</sup>.

As shown in table 3, the learning style mean score of all respondents was 11.75 of a maximum possible score of 18.

Table 3  
Means, standard deviations, and t-test of agricultural students' learning style scores by gender (n=124)

Gender	n	Mean	SD	t-Value
Male	54	12.92	4.02	2.38 *
Female	70	10.84	4.40	
Total	124	11.75	4.34	

Note: Raw scores are based on a maximum possible score of 18.

\* Significant at  $p < .05$

### Agricultural students' academic performance in relation to learning styles

The grade point averages (GPA) of agricultural students are demonstrated in table 4. It is recognizable that of the 124 agricultural students, 28 students (22.6%) were with the GPA below 14, 66 students (53.2%) were with the GPA between 14 and 16, and 30 students (24.2%) were with the GPA above 16.

Table 4  
Grade point average (GPA) of agricultural students

GPA	Frequency	(%)
< 14	28	22.6
14-16	66	53.2
> 16	30	24.2
Total	124	100.0

Note: Range of GPA is between zero and twenty

Table 5 presents learning style and grade point average (GPA) of agricultural students. It is recognizable that among students with the GPA <14, 71.4% preferred field-dependent learning style, while 28.6% preferred field-independent learning style. Among students with the GPA 14-16, 37.9% preferred field-dependent learning style and 62.1% preferred field-independent learning style. Among students with the GPA >16, 26.7% preferred field-dependent learning style, while 73.3% preferred field-independent learning style.

Table 5  
Learning style and grade point average (GPA) of agricultural students (n=124)

GPA	Field-Dependent		Field-Independent	
	Frequency	(%)	Frequency	(%)
< 14	20	71.4	8	28.6
14-16	25	37.9	41	62.1
> 16	8	26.7	22	73.3
Total	53	42.7	71	57.3

Means, standard deviations, and t-test of agricultural students' grade point average (GPA) by learning style are demonstrated in table 6. The data illustrates that the GPA for students preferred field-independent learning style (15.24 out of 20) was significantly higher than the GPA for students preferred field-dependent learning style (14.60 out of 20).

Table 6

Means, standard deviations, and t-test of agricultural students' grade point average (GPA) by learning style (n=124)

Learning Style	n	Mean	SD	t-Value
Field-Dependent	53	14.60	1.56	-2.49 *
Field-Independent	71	15.24	1.19	
Total	124	14.96	1.39	

\* Significant at  $p < .05$

## CONCLUSIONS AND RECOMMENDATIONS

Based on the findings of this study, the following conclusions were drawn and recommendations were given.

According to results, of the agricultural students, male students preferred field-independent learning style, while female students preferred field-dependent learning style. Using a t-test, the gender difference in raw mean scores on the Group Embedded Figure Test (GEFT) was found to be significant ( $t=2.38$ ;  $p < .05$ ). Since not all students learn the same; we recommend that colleges recognize the learning style differences of their students and teach in a manner in which all learning styles are considered.

Results showed that learning style affects agricultural students' academic performance. The grade point average (GPA) for agricultural students preferred field-independent learning style was significantly higher than the grade point average (GPA) for agricultural students preferred field-dependent learning style. Hence, it is imperative that students be assessed of their preferred learning style. Also, we recommend counseling on how agricultural students adapt their learning style to various teaching styles in classrooms and how they learn more effectively and efficiently.

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