Students' learning styles in vocational education

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Abstract

This study set out to identify the learning styles of second year university students who received vocational education in order to contribute to the design of learning environments and activities. The study used a survey research design. The sample consisted of 651 second year university students. The Grasha-Reichmann Student Learning Style Scale (GRSLSS) was used in this study as data collection instrument. The scale is a 5-point Likert type scale and consists of 60 items. The GRSLSS has six subscales (Independent, Dependent, Participant, Avoidant, Cooperative, and Competitive), each of which has 10 items. In this study, the Cronbach's alpha coefficient was found to be 0.83 for the total scale. In the process of analyzing the data, mean scores on the GRSLSS were calculated to identify students' preferred learning styles and the results were analyzed according to the range of mean scores (low, moderate, and high) for each learning style. Finally, the distribution of the number of students across the six learning styles was analyzed. This study set out to identify the dominant learning styles of second year university students and found that competitive and cooperative learning styles were predominantly preferred by the students.

1. Introduction

The world has undergone a rapid and enormous change in recent years. This has led to a need to adapt to the speed of change and innovation in every field from manufacturing to education, health, and tourism. Thus, it is of major importance to educate and train individuals who can design, produce and use technology in the Fourth Industrial Revolution (4IR), which has introduced concepts such as digital factories, smart devices, robotics systems, sensors, autonomous systems, digital production, and integrated systems (Lasa & Kemper, 2014; Tubas Ustaoğlu & Mayatürk Akyol, 2018). Indeed, the qualifications expected from individuals have also changed. Therefore, to educate

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individuals equipped with higher-order skills, it has become mandatory to make an extensive change and transformation in all levels of education, especially universities, where professional skills are mainly acquired (Yıldız Aybek, 2017).

Vocational education, which focuses on professional competencies required by today's world and aims to train high-quality labor force, plays a crucial role in facilitating human-oriented development (Ministry of Development, 2014). Ever-changing and reproduced information and technological and business developments increase the importance of vocational education needed for qualified human resources (Yıldırım & Çarıkçı, 2017). Therefore, it is of utmost importance to provide qualified education and training to human resources in accordance with the current and future needs of the industry.

Several critical factors affect quality education, such as teacher qualifications, learning environments and material, and student characteristics (Ünal, 2017). Previous research on education has shown that individual differences are important and essential for education and training, especially considering student characteristics (Demir, 2010; Güven & Kürüm, 2006). Learning is easier, more effective and more permanent in student-friendly learning environments that are sensitive to student characteristics (Senemoğlu, 2007). Each individual has their own learning style, which helps to learn information more easily through appropriate learning environments and materials (Şen, 2018). Quality education and skill development can be achieved through multifaceted learning experiences compatible with students' learning styles and in which they can have an active role (Benner, Sutphen, Leonard, & Day, 2010; Kaya & Akçin, 2002).

Learning styles, among the most important factors that affect learning, are defined as personal qualities that affect learners' ability to acquire information, interact with peers and teachers, and participate in different learning experiences (Grasha, 1994). Learning styles include learners' preferences in different educational and instructional activities and refer to a general tendency for different ways of information processing (Jonassen & Grabowski, 1993). In a broad sense, a learning style is the most appropriate way for an individual to understand, perceive and use what they learn (Özdemir, 2009).

Different methods are used to identify learners' learning styles. Several models have proposed so far such as Gregorc's Mind Styles Model, the Myers-Briggs Type Indicator, the Felder-Silverman Learning Style Model, Hill's Cognitive Style Interest Inventory, the Dunn and Dunn Learning Style Model, Kolb's Learning Styles, and the Grasha and Reichman Learning Styles.

This study used the Grasha-Reichman model of learning styles and the Grasha-Riechmann Student Learning Styles Scale (GRSLSS), which was built on this model. The GRSLSS classifies students' real responses in learning environments as independent, avoidant, cooperative, dependent, competitive, and participant (Grasha, 2002, p.128):

Independent: a group of students who like to think and have confidence in their learning abilities. They prefer to learn what they think is important and to work alone on course projects. They generally opt for independent study, self-paced instruction, assignments that allow them to think independently, projects that they can design, and student-centered rather than teacher-centered course designs.

Avoidant: a group of students who are not enthusiastic about learning and attending classes. They are indifferent to what goes on in class.

Cooperative: a group of students who believe they can learn by sharing their ideas and abilities. They like to collaborate and work with the teacher and others. Their general classroom preferences include small group discussions, small seminars, and group projects.

Dependent: a group of students who need authority for what they have to do. They adopt a teacher-centered classroom design.

Competitive: a group of students who believe they need to compete with other students to be the center of attention and recognized for their achievement in the classroom. They prefer teacher-centered classroom environments.

Participant: a group of students who are willing to do more of the required and optional course activities. They enjoy attending classes. They prefer class discussions and class reading assignments.

Considering that students adopt an approach which is the most comfortable for them to learn (Islam, 2019), there is a clear need to identify students' learning styles to ensure quality education. Individuals' awareness of which learning style they have is a critical element that brings success in education, work, and social lives and as important as the fact everyone has their own learning style (Biggs, 2001). Given that learning styles are not the same for everyone, student characteristics should be identified to prepare learning environments suitable for students (Peker & Aydın, 2003).

Student characteristics, namely individual differences must be identified and taken into account to ensure qualified professional education. Thus, an effective learning environment should be designed keeping in mind that each student has different learning styles. Previous studies have confirmed that a learning environment based on learning styles is a crucial factor in increasing students' academic achievement (Dikmen, 2015; Kaf Hasırcı, 2005; Topuz & Karamustafaoğlu, 2013).

This study set out to identify the learning styles of second year university students who receive vocational education in order to contribute to the design of learning environments and activities. Specifically, the aim of this study was to identify the learning styles of second year university students using the GRSLSS.

2. Method

The study used a survey research design to identify the learning styles of second year university students. Survey research tries to describe the current or past state of an event, a group or a phenomenon within their natural conditions (Karasar, 2009).

2.1. Sample

The sample consisted of 651 second year university students. Table 1 shows the descriptive statistics on the gender variable.

Table 1. *Descriptive Statistics on the Gender Variable*

Gender	*f*	%
Female	260	39.9
Male	391	60.1
Total	651	100

As seen in Table 1, among the responding students, 260 (39.9%) were female and 391(60.1%) were male. Table 2 displays the descriptive statistics on the second year university programs in which the students are enrolled.

Table 2. *Descriptive Statistics on Programs*

Programs	*f*	%
Computer Programming	140	21.5
Machinery	32	4.9
Winemaking	5	0.8
Fashion Design	19	2.9
Accounting and Taxation	61	9.4
Electronic Technology	50	7.7
Real Estate and Property Management	27	4.1
Hair Care	7	1.1
Air conditioning	24	3.7
Child Development	84	12.9
Interior Design	10	1.5

Electricity	49	7.5
Tourism	20	3.1
Automotive	23	3.5
Construction	36	5.5
Textile	21	3.2
Electronic Communication	6	0.9
Radio and Television	37	5.7
Total	651	100

2.2. Data collection instrument

The study used the GRSLSS (Grasha, 2002). The scale was adapted to Turkish by Sarıtaş and Süral (2010). The scale is a 5-point Likert type scale and consists of 60 items. The GRSLSS has six subscales (Independent, Dependent, Participant, Avoidant, Cooperative, and Competitive), each of which has 10 items. In this study, the Cronbach's alpha coefficient was found to be 0.83 for the total scale. Scores for each learning style are rated as "low", "moderate", and "high". Table 3 displays the range of low, moderate, and high scores for each learning style. The study also used a personal information form.

Table 3. *Scoring of the GRSLSS*

Learning Styles	Low	Moderate	High
Independent	[1.0-2.7]	[2.8-3.8]	[3.9-5.0]
Dependent	[1.0-2.9]	[3.0-4.0]	[4.1-5.0]
Participant	[1.0-3.0]	[3.1-4.1]	[4.2-5.0]
Avoidant	[1.0-1.8]	[1.9-3.1]	[3.2-5.0]
Cooperative	[1.0-2.7]	[2.8-3.4]	[3.5-5.0]
Competitive	[1.0-1.7]	[1.8-2.8]	[2.9-5.0]

2.3. Data analysis

In analyzing the data, mean scores on the GRSLSS were calculated to identify students' preferred learning styles and the results were analyzed according to the range

of mean scores (low, moderate, and high) for each learning style, as shown in Table 3. The distribution of the number of students across the six learning styles is presented in Table 4. Finally, the distribution of the mean scores on the GRSLSS was analyzed for each learning style to determine the dominant learning styles of the responding students according to the programs in which they are enrolled (Table 5).

3. Results

In This section presents the findings of the study. Table 4 shows the mean scores of the responding students according to their preferred learning styles.

Table 4. *Students' Mean Scores on the GRSLSS*

	Low (N)	**Moderate (N)**	**High (N)**	*x*	*SD*	**Level**
Independent	23	**381**	247	3.6966	.52315	Moderate
Dependent	38	**406**	207	3.7980	.51271	Moderate
Participant	109	**394**	148	3.6048	.63589	Moderate
Avoidant	34	**322**	295	3.0415	.69614	Moderate
Cooperative	69	170	**412**	3.6280	.68424	**High**
Competitive	16	131	**504**	3.3986	.78322	**High**

As seen in Table 4, the mean scores on the cooperative (3.62%) and competitive (3.39%) learning styles resided in the high range according to the range of mean scores. The mean scores on the other learning styles resided in the moderate range. Table 4 also shows the number of students for each learning style. Accordingly, among the students who preferred the independent learning style, 23 scored in the low range, 381 scored in the moderate range, and 247 scored in the high range. Among those who preferred the dependent learning style, 38 scored in the low range, 406 scored in the moderate range, and 207 scored in the high range. Among those who preferred the participant learning style, 109 scored in the low range, 394 scored in the moderate range, and 148 scored in the high range. Among those who preferred the avoidant learning style, 34 scored in the low range, 322 scored in the moderate range, and 295 scored in the high range. Among those who preferred the cooperative learning style, 69 scored in the low range, 170 scored in the moderate range, and 412 scored in the high range. Among those who preferred the competitive learning style, 16 scored in the low range, 131 scored in the moderate range, and 504 scored in the high range. Table 5 shows the distribution of students' mean scores on the GRSLSS according to their programs.

Table 5. *Distribution of Students' Mean Scores on the GRSLSS by Their Programs*

Programs	Independent	Level	Dependent	Level	Participant	Level	Avoidant	Level	Coop.	Level	Comp.	Level
Computer Programming	3.64	Moderate	3.75	Moderate	3.47	Moderate	3.14	Moderate	3.58	**High**	3.30	**High**
Machinery	3.70	Moderate	3.84	Moderate	3.65	Moderate	3.28	**High**	3.87	**High**	3.46	**High**
Winemaking	3.84	Moderate	4.00	Moderate	4.00	Moderate	2.60	Moderate	3.60	**High**	3.20	**High**
Fashion Design	3.83	Moderate	3.84	Moderate	3.78	Moderate	2.8	Moderate	3.63	**High**	3.63	**High**
Accounting and Taxation	3.75	Moderate	3.85	Moderate	3.59	Moderate	3.09	Moderate	3.42	**High**	3.42	**High**
Electronic Technology	3.62	Moderate	3.68	Moderate	3.60	Moderate	2.84	Moderate	3.58	**High**	3.32	**High**
Real Estate and Property Management	3.77	Moderate	3.85	Moderate	3.55	Moderate	2.85	Moderate	3.66	**High**	3.33	**High**
Hair Care	3.71	Moderate	3.85	Moderate	3.71	Moderate	2.85	Moderate	3.57	**High**	3.42	**High**
Air conditioning	3.66	Moderate	3.95	Moderate	3.8	Moderate	2.79	Moderate	3.83	**High**	3.62	**High**
Child Development	3.69	Moderate	3.80	Moderate	3.72	Moderate	2.84	Moderate	3.72	**High**	3.34	**High**
Interior Design	4.00	**High**	4.00	Moderate	3.90	Moderate	3.20	**High**	4.00	**High**	3.90	**High**
Electricity	3.65	Moderate	3.73	Moderate	3.51	Moderate	2.97	Moderate	3.57	**High**	3.42	**High**
Tourism	3.75	Moderate	3.90	Moderate	3.70	Moderate	3.15	Moderate	3.75	**High**	3.30	**High**
Automotive	3.60	Moderate	3.87	Moderate	3.65	Moderate	3.26	**High**	3.52	**High**	3.47	**High**
Construction	3.77	Moderate	3.88	Moderate	3.55	Moderate	3.11	Moderate	3.75	**High**	3.41	**High**
Textile	3.71	Moderate	3.80	Moderate	3.57	Moderate	3.28	**High**	3.47	Moderate	3.52	**High**

| Electronic Communication | 3.66 | Moderate | 4.00 | Moderate | 3.66 | Moderate | 3.33 | **High** | 4.00 | **High** | 3.33 | **High** |
| Radio and Television | 3.64 | Moderate | 3.64 | Moderate | 3.51 | Moderate | 3.13 | Moderate | 3.48 | Moderate | 3.35 | **High** |

It is apparent from Table 5 that the cooperative and competitive learning styles were the dominant preference according to the distribution of learning styles by the programs in which the students are enrolled in. The students enrolled in the interior design program also scored in the high range for the independent and avoidant learning styles, apart from the cooperative and competitive learning styles. Additionally, those enrolled in the machinery, automotive, and electronic communication programs scored in the high range for the avoidant learning style, apart from the cooperative and competitive learning styles. The students enrolled in the textile program scored in the high range for the competitive and avoidant learning styles, rather than the cooperative learning style.

4. Discussion and Conclusion

This study was undertaken to identify the learning style preferences of second year university students to determine their dominant learning styles. The study found that the mean scores on the competitive and cooperative learning styles were in the high range. Learners with a competitive learning style tend to outperform in classes to stand out and be notable for their performance (Grasha, 2002). A student who continues his or her education within the Turkish education system has to take many exams throughout the period from primary school to university. Therefore, students are or have to be in continuous competition throughout their education. It seems that this ongoing competition affects students' preferences for learning styles and this may explain the result that the competitive learning style is a dominant preference. This result corroborates those of previous research (Varışoğlu, 2018; Khalid, Akhter & Hashmi, 2017; Arseven, 2016; Aydemir, Koçoğlu, & Karali, 2016; Ural & Morgil, 2016; Kulac, Sezik, Ascı, & Gürpınar, 2015; Ford & Robinson, 2015).

Based on the results of this study, the cooperative learning style is also a dominant preference of the students. Learners who adopt a cooperative learning style enjoy working with teachers and other learners and believe that learning can be accomplished by sharing knowledge and abilities (Grasha, 2002). The second year university programs in vocational education included in the scope of this study most often use project-based, group work, and cooperative learning methods. This situation also seems to affect students' preferences for learning styles; thus, it may be a possible explanation for the result of this study. Students need to collaborate and work on project assignments. Students who are aware of this accordingly prefer a relevant learning style. The result

that the cooperative learning style is a dominant preference is in line with those observed in earlier studies (Khalid, Akhter, & Hashmi, 2017; Bilgin & Bahar, 2008).

The study also analyzed the distribution of the number of students across the six learning styles according to the range of their mean scores on the GRSLSS. It was found that most of the students scored in the high range for the competitive and cooperative learning styles. This result is consistent with the result that the mean scores on the competitive and cooperative learning styles were in the high range. Finally, the distribution of the mean scores on the GRSLSS was analyzed for each learning style to determine the dominant learning styles of the responding students according to the programs in which they are enrolled. The mean scores on the competitive learning style resided in the high range in all the programs. The mean scores on the cooperative learning style also resided in the high range in the programs other than Textile, and Radio and Television. These results also run in parallel to the other results of the study. This result may be explained by the fact that the relevant second year university programs use project-based, group work, and cooperative learning methods in classes and students have to take several exams ranging from primary school to university. In addition, there are studies suggesting that there is a relationship between learning styles and vocational preferences, although there is no difference between the students' vocational preferences and learning styles in this study (Eren, 2006; Slaats, Lodewijks & Van Der Sanden, 1999; Ergür, 1998). Further studies are needed to clarify this issue.

Taken together, these results showed that the majority of the responding students predominantly preferred the cooperative and competitive learning styles. It is important for lecturers, who teach courses to these students, to take this data into consideration when planning the learning process. Indeed, teachers' awareness of which learning styles learners prefer helps them to provide effective guidance to learners during their developmental process. For example, a student who predominantly prefers the competitive learning style can be given responsibilities and encouraged to take leadership in classes in order to stimulate his or her learning motivation. Group work or teamwork and experience sharing sessions can be effective for students who predominantly prefer the collaborative learning style (Grasha, 2002). In a nutshell, if lecturers know students' learning styles, it can offer an advantage in designing learning processes suitable for students. In this way, success can be achieved in vocational education which aims to train high-quality labor force in line with modern professional competencies. This success is of great importance in eliminating the need for qualified human resources that can adjust to technological and business developments and that societies need in order to achieve their development goals.

This study set out to identify the dominant learning styles of second year university students and found that competitive and cooperative learning styles were predominantly preferred by the students. However, students who prefer learning styles different from

those preferred by the majority of students should not be neglected while planning learning processes. It is important to choose methods and techniques suitable for student characteristics in order to reach all students. The identification of learning styles preferred by students at the beginning of an academic year is considered necessary for the desired learning environments because every individual uses their preferred learning style throughout their education. It is thus of great importance for teachers to know which learning styles students prefer and to help them develop themselves in the direction of their preferences so that effective learning can be achieved. It is therefore recommended that learnings styles be identified and different teaching methods be used in classes with students with different individual characteristics and different learning styles in order to respond to the differences among students and provide equal and fair educational opportunities.

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