The Effect of Perceived Structure of Classroom on the Choice of Problem, Effort, Persistence and Academic Performance

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Abstract:

The purpose of this study was to investigate the effect of perceived classroom structures on the choice of problem, effort and persistence in practical tasks and academic performance of students. The method used in this study was a pretest-posttest. 48 individuals were selected randomly and were divided into three groups of mastery structure, performance structure and control. The data was analyzed using multivariate analysis of variance (MANOVA). Results revealed that the mean scores for effort in mastery group were significantly higher than that of performance ($p<0.01$) and control group ($p<0.001$). In addition, the average scores for effort in performance group were significantly higher than the scores in control group ($p<0.05$). The average scores for choice of problem and academic performance in mastery group were significantly higher than the scores in control group ($p<0.05$). Finally, there was no significant difference between the average scores of persistence among groups. Mastery structure of the classroom is very effective in creating progress behavior and increasing academic performance.

Keywords: *Mastery Structures, Performance, Progress Behavior.*

I. INTRODUCTION

Universities and higher education institutions have always been trying to find the best educational methods in order to train students that are self-motivated, active, interested and successful in their academic affairs and enjoy desirable levels of academic performance. Academic performance and academic goal achievement are also very important to students because these criteria would help them in entering an occupation or higher academic levels. On the other side, educational theorists and researchers need experimental evidence regarding the effective factors on learning and academic success in different cultures and different educational systems in order to present their theories. The focus of this study was on students' perception of classroom structure as an external factor affecting academic task and performance. This study was based on the social cognitive theory of achievement goal. This theory was the dominant approach in the field of achievement motivation since the previous decade.

Many studies have investigated the role of classroom perception in motivation and orientation of achievement goal of the learners (Church ,Elliot and Gable., 2007; Pintrich, 2004). Studies have shown that psychological atmosphere of the class, social characteristics and teachers' support have significant effects on achievement goals, causal attribution, learning strategies, academic motivation, emotional performance, academic engagement academic values and academic achievements (Dinger,Dickhauser ,Spinath and Steinmay, 2013; Boekaerts, 2002; Davis, 2003; Hospel and Galand, 2015; Badiee, Bakhani & Hashemian, 2 014; Babakhani, 2014; Rastgaar et al, 2013). Dinger et al. (2013) believed that perception of classroom is formed based on the goals and value of the teacher. However, the way it affects the motivation and performance of the learners depends on students' perception of classroom structure.

In recent years, three classroom perceptions have been focused on, namely, motivational tasks (meaningfulness and attractiveness of the assignments for learners), mastery assessment (degree of appropriate cognitive performance and evaluation, the degree of emphasize on social comparisons and competition and learning) and autonomy support (Lyke, Kelaher Young and Alison, 2006). Though personality traits and previous achievements of the learners play some roles in their goal orientation, the theory of achievement goal is based on the idea that classroom goal structure is more effective and determining (Patrick and Ryan, 2008). In fact, individuals' perceptions of performance goals are affected by environmental, social, classroom and school factors such as teachers' opinion about difficulty of the task, the perceived ability from classroom atmosphere and the information about the importance of learning and literacy (Urdan and Schoenfelder, 2006). Individual achievement goal orientation, behaviors and motivational patterns are affected by the type of tasks, scoring procedures, autonomy level of the learners and grouping methods (Kaplan and Middleton, 2002; Urdan, 2004; Hospel and Galand, 2015).

Hospel and Galand (2015) reported that students' perception of the classroom structure and autonomy support has an important role in emotional engagement with the tasks. Emotional engagement with the task has been investigated largely in recent years (Fredrick and McColskey, 2012; Babakhani, 2014; Deci and Ryan, 2008).

Many studies have emphasized the role of different aspects of social contexts, autonomy support and perception of classroom structure on students' learning. Emotional engagement with tasks is related with energy and the efforts that the students put on the task (Reeve, 2007; Skinner, Furrer, Marchand & Kindermann, 2008). There have been

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many discussions on the relationship between aspects of autonomy support and emotional engagement with task (Jang et al., 2010; Vansteenkiste, SIeren, Goossens, 2012). Autonomy support refers to level of psychological freedom that the teachers provide for students in orientation of their behavior (Assor et al., 2002). Classroom structure refers to the amount and clarity of the information given to the students about the expectations of the teacher, desired goals, challenges and feedbacks (Jang et al. 2010; Reeve, Jang, Carrell, Jeon & Barch, 2004; Reeve, 2006; Vansteen Kiste, Sieren, Goossens, Soenens, Dochy and Mouratids, 2012). Students' thoughts, interpretations and perceptions of the classroom are mediums of interaction in the classroom. Since students' personal experiences will affect the way they perceive the classroom structure, the perceived classroom structure of the students about a same class might be totally different. Students' attitude toward and reaction o the tasks and learning are highly dependent on their perception of the classroom structure. The different features of classroom structures that can affect students' perception are tasks, independence, autonomy, recognition, grouping, evaluation and time. A medium challenge task can lead to students' active engagement with task and in turn can lead to mastery. Researchers have shown that if the teachers have high expectations of their students and at the same time provide continuous social, emotional and motivational support to them, the process would lead to a mastery goal structure in the classroom (Turner, Midgley, Meyer, Cheen and Kang, 2002).

Langfred and Moye (2004) identified three factors of the classroom perceptions that can lead to mastery goal structure. The first factor is meaningfulness and attractiveness of the tasks and the degree to which the tasks are related to real life. The second one is degree of perceived support by the student from the teacher. The third one is sound evaluation and valuing real learning instead of memorizing. Dupont, Galand, Nills & Hospel (2014) showed that there is a significant relationship between students' mastery goals and meaningfulness and attractiveness of the task. Dinger et al. (2013) believed that the difficulty level of the task must be medium challenging in order to engage the learner. The teachers that care about mastery structure (real learning) make students appreciate the fact that all of them can learn and master the curriculum. In this structure, learning or mastery are more important than the score. In these classrooms the students are encouraged to nurture their positive behaviors while in achievement oriented classroom structure, the dominant perception is that the students with higher scores are better than others. In the latter structure, good students feel that they are more valuable than others and thus put more time and effort and reinforce their abilities. However the students with lower marks avoid classroom task and tasks (Urdan and Schoenfelder, 2006).

The purpose of this study was to investigate the effect of perceived classroom structures on the choice of problem, effort and persistence in practical tasks and academic performance of students. Though the relationship between individual achievement goal orientation and motivational behaviors have previously been investigated (Badri et al., 2010; Niknaam and Jokaar, 2014; Hejazi et al., 2009; Hejazi and Naghsh, 2008), the relationship between classroom perceived structure and motivational behaviors has not been investigated by the researchers. On the other hand, most of the previous studies used correlational methods to investigate the relationships (Mikieili and Isa Zadegan, 2015; Hejazi et al., 2009). However, Tale Pasand (2006) has investigated the effects of perceived classroom structure on choice of the problem, effort and persistence in solving algorithm and flowchart problems among male students of computer sciences.

One of the problems of the previous studies was that they used self-report measures for assessment of motivational behaviors and individual achievement goal orientations. Self-assessments are deficient in nature (measurement errors, lack of introspection). Another problem in previous studies was that they either investigated the effect of perceived classroom structures on goal orientation or the effects of individual achievement goal orientation on motivational behaviors. In this study, the direct relationship between perceived classroom structures and motivational behaviors was investigated. In addition, there was no experimental research in Iran, investigating the mastery and performance based structures and their effects on motivational behaviors, particularly among students of Payam-e Noor University.

The main hypothesis of the study is that choosing practical assignments (tasks) with medium challenge, efforts, and persistence and achievement scores are higher in mastery-based structure than in performance-based or traditional structure.

II. MATERIALS AND METHODS

The design of the study was pretest-posttest and the participants were selected using available sampling method. The participants of the study were 48 individuals who took the course of "principles and techniques of consultation" in academic year 2015-2016 in Payam-e Noor University. The individuals were put into three groups randomly. In the first group, mastery structure was used and in the second group performance structure was used. The second group was a control group. All three groups took a pretest before intervention and a posttest after intervention.

Choice of problem

Each testee was given a list of 15 assignments ranked by difficulty level (5 difficult assignments, 5 easy assignments and 5 medium assignments). Testees were told to choose 5 assignments. Individuals were free in choosing the difficulty level of the assignments. However, in scoring the assignments only the number of medium assignments chosen by the individuals was counted.

Below are the methods used to collect information about the number of medium challenging problems, effort and persistence among students.

Efforts

Each testee was given 5 assignments and the answer to all of them was given to the individuals in an envelope. The testees were told to do the assignments without opening the envelopes. Only if they could not do the assignments they were allowed to see the answers. The degree of effort was estimated by counting the number of the assignments individuals answered correctly. Since the answers were not

objective, the answers of the testees were scored by two referees. The agreement coefficient of the referees' scores was 0.94.

Persistence

The examiner described a consultation situation orally to the individuals and told the "it is a difficult question and nobody is expected to be able to answer the question. Though, you try your best to think of good consultations for this situation. Then submit your papers and leave the classroom. There was no time limit in this test. The persistence of the individuals was estimated based on the amount of time they spent in the class, regardless of having answered the questions or not. Two referees were present to keep the times for the testees and the agreement coefficient between the referees was estimated to be 0.98 which was regarded as the reliability of the test.

Academic achievement

In order to assess the achievement of the individuals, the average score of the previous semesters was used as the pretest and the score of the practical test was used as the posttest. In the practical test, each individual was asked to do a 30 minute consultation with real patients. The performance of the individuals was scored based on a checklist. 40 items that were named as important factors in consultation according to Rodgers were selected. 21 items were desirable factors and 19 items were undesirable factors. The scoring procedure consisted of giving +1 score for each desirable factor and -1 score for each undesirable factor. In order to estimate the reliability of the practical test, the checklist was scored by two referees separately. The average of the scores given by the referees was taken as the achievement score and the correlation coefficient of the scores was taken as the reliability index of the test scores. The reliability coefficient was estimated to be 0.97. Content and face validity of the checklist was approved by two experts in psychology and a consultation expert all of them were assistant professors.

The individuals were put into three groups. In the first group, mastery structure was used and in the second group performance structure was used. The second group was a control group. Before interventions (the independent variable) the values of choice, effort and persistence of the individuals were collected. The intervention included 17 sessions and each session lasted 120 minutes. The content of the intervention was the same for mastery and performance group. The topics covered in each session are listed below.

1st session: The reasons for choosing consultation, the characteristics of an effective consultant and the arrangement of the consulting room.

2nd session: Focusing on the sources and using short answers.

3rd session: Content reflection.

4th session: Emotion reflection.

5th session: Content and emotion reflection.

6th session: Visual, aural and emotional methods.

7th session: Asking questions.

8th session: Summarizing.

9th session: Reframing.

10th session: Encountering (facing).

11th session: Fighting self-destructive beliefs.

12th session: Investigating the solutions (finding the options).

13th session: Facilitative measures.

14th session: Rights of consulters.

15th session: Confidentiality and moral principles.

16th session: Dual relationship.

17th session: Finishing a consultation session.

The intervention sessions were administered on Thursdays for mastery and performance groups and the control group received normal instructions on Mondays.

III. RESULTS

The mean and standard deviation of the variables in pre and post tests were presented in the table 1. In the mastery group the effort score increased from 0.94 to 3.06 after the intervention. In the performance group the average score for effort increased from 0.75 to 1.87 after the intervention. It can be observed that the change was greater in mastery group. In the control group the average score for effort increased from 0.56 to 0.81 which was not statistically significant. Regarding persistence variable, the scores increased from 70.43 to 82 in mastery group while it decreased from 96.62 to 75.25 in performance group. The control group also underwent an insignificant decrease in this regard from 62.56 to 60.12. Regarding the variable of choice of problem, the average score of mastery group increased from 1.87 to 3.44. In the performance group, the score increased from 1.69 to 2.19. This score has also increased in the control group from 1.69 to 1.81. Regarding the variable of academic achievement, the average score increased from 15.05 to 15.23 in mastery group. However, this score decreased in the performance group from 13.58 to 12.11. The control group has also experienced a decrease in the average score of academic achievement from 12.90 to 9.18.

Since there was one independent variable and four dependent variables in 2 tests (pretest and posttest), covariance analysis was the best type of analysis for this study. However, because the prerequisites were not present (Covariate interaction test was not significant for effort, persistence, choice and performance). Box's test of equivalence of covariance matrices was significant between groups ($p<0.05$). Thus, Pillai's trace test was used for multivariate tests.

Table 1. Average and standard deviation of the research variables

Variable	Pre and post test	Mastery		Performance		Control	
		Mean	SD	Mean	SD	Mean	SD
Effort	Pretest	0.94	0.85	0.75	0.68	0.56	0.73
	Posttest	3.06	0.99	1.87	1.02	0.81	0.83
Persistence	Pretest	70.43	47.08	96.62	113.99	62.56	56.46
	Posttest	82	40.42	75.25	59.26	60.12	50.98
Choice	Pretest	1.87	0.62	1.69	1.14	1.69	1.19
	Posttest	3.44	1.09	2.19	2.07	1.81	1.22
Performance	Pretest	15.05	1.98	13.58	2.15	12.90	1.71
	Posttest	15.23	2.61	12.11	3.83	9.18	2.35

The results of multivariate analyses revealed that the differences between groups were significant (Pillai's Trace = 0.695, $F_{8, 86} = 5.73$, $p < 0.001$, ES = 0.348). The results of Univariate post-hoc (follow-up) test were presented in table 2. Regarding the effort scores, results indicated that the difference between groups is significant ($F_{2.45} = 16.46$, $p < 0.001$, ES = 0.42). There was no significant difference between the groups, regarding the scores of persistence ($F_{2.45} = 1.89$, $p > 0.05$). There was a significant difference between groups regarding the scores of choice ($F\ 2.45 = 3.46$, $p < 0.05$, ES = 0.13). Finally, there was a significant difference between groups, regarding the scores of academic achievement.

The results of Tukey post-hoc test revealed that the effort scores in mastery group were significantly higher than in performance ($p<0.01$) and control group ($p<0.001$). In this regard, performance group had higher scores than control group ($p<0.05$). Regarding the choice variable, the scores in mastery group were significantly higher than in control group ($p<0.05$). Regarding the achievement variable also, the scores of mastery group were significantly higher than control group ($p<0.05$).

Table 2. The Univariate post-hoc test results

Source		Sum of squares	Df	Mean of squares	F	Sig.	Effects
Group	Effort	28.167	2	14.083	16.461	0.001	0.422
	Persistence	8744.042	2	4372.021	1.898	0.162	0.078
	Choice	17.792	2	8.896	3.46	0.04	0.133
	Performance	122.686	2	61.343	7.322	0.002	0.246

IV. DISCUSSION AND CONCLUSION

The purpose of this study was to investigate the effect of perceived classroom structures on the choice of problem, effort and persistence in practical tasks and academic performance of university students in Payam-e Noor University. Results revealed that the mean scores for effort in mastery group were significantly higher than that of performance and control group. In addition, the average scores for effort in performance group were significantly higher than the scores in control group. The student who perceived the class structure as mastery tried to think on their own to find the answers, though they were provided with the answers. Thus, they answered more questions. These findings were in line with the studies of Dinger et al. (2013), Babakhani and Hashemian (2014), Talepasand (2006) and Hospel and Galand (2015). Dinger et al. (2013) showed that the perceived classroom atmosphere, teachers' social characteristics and teachers' support had significant effect on students' engagement with task and academic values. Babakhani and Hashemian (2014) emphasized the effect of classroom psychological atmosphere on achievement goals, academic motivation and engagement with the tasks and assignments. Hospel and Galand (2015) also emphasized the effect of students' perception of classroom structure on emotional engagement with assignments.

In this study, no relationship was found between mastery and performance structure and persistence among students. This finding was in line with Dinger et al. (2014). They found that medium challenging tasks are the best way to engage the students and difficult tasks prevents cognitive engagement ad lessens learning motivation. However, this finding was not in line with Lyke et al. (2006), Hospel and Galand (2015) and Tale Pasand (2006). Lyke et al. (2006) showed mastery assessment can increase persistence in doing the assignments. Hospel and Galand (2015) found that students with mastery goals will continue their efforts when encountering challenges. These students tend to do challenging tasks and have better feelings toward their learning environment. Tale Pasand (2006) also revealed that the students with less academic achievements were more persistence in solving the problems than the students with better achievements. The reason behind the different findings may be in the nature of the problems given to students. Naturally, consulting problems are much different from objective problems such as flowchart or algorithm. Another reason can be the differences in giving the instructions to students. In this study, students were told that the scores of the tests are not part of your academic career and will not be accounted in your university grades. Another reason can be due to the persistence test's being the last test administered for the students and the students might have been tired which directly affects their persistence,

The other finding if this study was that mastery group selected more tasks with medium challenge than control group. This was in line with Reeve (2002), Deci and Ryan (2008), Skeez et al. (2008) Fredricks and McCloskey (2012) and Babakhani (2014). According to Reeve (2002) and Deci and Ryan (2008) those features of assignments that affects students' mastery motivation are attractiveness of the assignments. Skeez et al. (2008) have emphasized the importance of meaningfulness of the assignments. Fredricks and McCloskey (2012) found that attractiveness of the assignments are very important in student's choice. Based on achievement goal theory, though students' personality traits, previous successes and achievements affect individuals' goal orientation, classroom goal structure such as attractiveness of the tasks and challenging presentation of lessons are more effective and determining. Babakhani ,2014,Bayanfar,2014,2015 found that psychological atmosphere of the class, social characteristics and teachers' support have significant effects on achievement goals, causal attribution, learning strategies, academic motivation, emotional performance, academic engagement academic values and academic achievements.

Based on the findings of this study, teachers' characteristics and acts affect students' perception of class structure and the perceived classroom structure can significantly affect students' performance. Students' personality traits also affect their perception of the classroom structure. On the other hand, as a result of these differences, the students pay attention and understand the motivating and attractive aspects of assignments.

The results of this study revealed that mastery classroom structure can affect students' academic performance. This finding was in line with previous studies. Regarding academic performance, researchers believe that assignments that can engage learners can help them in learning and in choosing more appropriate goals and appreciate the purposes of the tasks (Davis 2003; Pintrich, 2004; Church et al., 2007). One of the common points that all of the researcher take into

account is that in mastery classroom structure, students focus on promotion of their skills and try to understand the new information and skills. Based on achievement goal theory, classroom goal structure such as attractiveness of the tasks and challenging presentation of lessons are effective and determining in academic performance (Patrick and Ryan, 2008; Skinner et al, 2008; Vansteenkiste et al., 2012).

All in all, the findings of this study were in line with previous studies and it was confirmed that perceived classroom structures affect students' motivation. These findings can be used in Payam-e Noor University. It was shown that if the content of the courses are engaging, attractive, meaningful, practical and related to the real life, the students will be motivated in learning them and put more effort in doing the assignments and will be more persistence in case of challenges.

One of the limitations of the present study is the generalizability of its findings. Since the individuals were chosen using available sampling, the findings cannot be easily generalized. The other limitation of the study is related to the time the effects of interventions will last. Because the control group received only 8 sessions of intervention, the effects may have not been realized carefully in case of some variables such as persistence. Another limitation of the study is the moderating effects of some variables such as previous achievements. Some evidenced showed that previous achievements can moderate perceived structures.

It is recommended to investigate the effects of perceived structures on other courses in order to provide evidences to generalize the findings of the studies in this regard. Regarding the insignificant effects of intervention on persistence variable, there is a probability that the type of assignment can have moderating effects. Thus, it is recommended to investigate the effects of type of assignments as a moderating variable. Finally, it is recommended to implement this study in other universities in order to provide more information in this regard so as to generalize the findings of such studies.

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