Original Article

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Presenting the students' academic achievement causal model based on goal orientation

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Abstract

Introduction: Several factors play a role in academic achievement, individual's excellence and capability to do actions and tasks that the learner is in charge of in learning areas. The main goal of this study was to present academic achievement causal model based on the dimensions of goal orientation and learning approaches among the students of Medical Science and Dentistry courses in Guilan University of Medical Sciences in 2013.

Methods: This study is based on a cross-sectional model. The participants included 175 first and second year students of the Medical and Dentistry schools in Guilan University of Medical Sciences selected by random cluster sampling [121 persons (69%) Medical Basic Science students and 54 (30.9%) Dentistry students]. The measurement tool included the Goal Orientation Scale of Bouffard and Study Process Questionnaire of Biggs and the students' Grade Point Average. The study data were analyzed using Pearson correlation coefficient and structural equations modeling. SPSS 14 and Amos were used to analyze the data.

Results: The results indicated a significant relationship between goal orientation and learning strategies ($P<0.05$). In addition, the results revealed that a significant relationship exists between learning strategies [Deep Learning ($r=0.37$, $P<0.05$), Surface Learning ($r=-0.21$, $P<0.05$)], and academic achievement. The suggested model of research is fitted to the data of the research.

Conclusion: Results showed that the students' academic achievement model fits with experimental data, so it can be used in learning principles which lead to students' achievement in learning.

Keywords: Goal, Orientation, Learning, Strategies, Academic achievement

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Introduction

The experts in learning psychology have introduced the individual goals and motivations as one of the specifying areas of learning and academic achievement entitled goal-orientation approach (1, 2). Goal-orientation has drawn the attention of many scholars in achievement motivation and achievement goals theories (3, 4). It points to a model of recognition and action whose outcomes have come true because of pursuing the goals of success (5); also, there is a positive effect between meta-cognitive skills and its components and academic achievement and causes enhancement in academic performance. The skill known as self-control has been recognized as the only variable predicting

the students' academic achievement (6), being associated with some concepts such as meta-cognitive activities, intrinsic motivation, and learning strategies (7). In fact, goal-orientation is the basis of individual differences in academic situations, based on which it is possible to predict an individual's success in such situations (8, 9). This orientation in academic situations indicates the motivation of a person for education; that is why it affects their inclinations, actions and responses in learning situations. In Zhang and Sternberg's perspective, this motivation is believed to be the idea behind why one decides to learn (10). The conducted studies in this field imply that purposefulness and goal orientation come up with cognitive, emotional and motivational outcomes in the individuals (11). As described, the most difficult goals, as a standard, lead to a high level of efforts and performance .In this regard, it can be interpreted that adopting the type of goal (Leaning Goal Orientation, Performance Goal Orientation and Avoidance Goal Orientation) outlines the motivation level for a certain performance (7, 12, 13). Research records have shown the roles of goal orientation on academic achievement as behavioral outcome. The research findings have gained a positive significant relationship between mastery goal and academic achievement. The research findings have gained a positive significant relationship between mastery goal and academic achievement (14). Also, as to performance goal, evidence exists on the relationship between this type of goal and academic attainment (13, 15). Regarding the avoidance performance goal, the studies have indicated that the subjects who are not coordinated with such orientation are more inclined to this direction acquiring lower scores and, consequently, have lower academic achievement (3).

Of other significant variables explaining the students' academic achievement in this research is learning approaches. In the recent years, our insight has remarkably developed about the learners' learning condition and study strategies, reasons, and methods (16, 17). A study in this area has yielded vivid implications in order to boost learning and teaching area. Studies have revealed that the learners' learning is not an independent aspect of duty or leaning area; rather, it is a reflection of demographics and learning situations interaction they encounter with (18). Learning approach as one of the sources of individual differences in performance and academic attainment displays the individual's preferred style in studying and learning the material (17). Matron et al. indicated that there was some coordination between the type of motivation and learning strategies. The studies in this field have identified two very fundamental approaches entitled Surface Approach (SA) and Deep Approach (DA) (18). Each of these approaches has two dimensions known as motivational and strategic and the factors determining the quality of specific learning assignments' results (19, 20). Besides, some dimensions, such as the assessment method, teaching strategy and learning settings, have been introduced as learning dimension (21).

As described, the students adopting deeper approach in learning intend to perceive the author's meaning and associate it with their own prior knowledge and personal experience, to diligently interact with the content and link the evidence within the text to its results (21, 22). In contrast, the learners prefer the surface approach; the goal they pursue behind studying is to merely do assignment, memorize the required information for educational assessment, concentrate on the cohesion-free separate elements and mainly underline studying solely for reproducing information with no further analysis (23, 24). The extracted results of various studies stress the positive relationship between deep learning approaches and academic attainment and negative relationship between surface approach and academic achievement (25, 26). The medical science universities are noted as one of the most fundamental higher education institutions. The students are one of the system inputs requiring targeted process in order to acquire knowledge and produce science. Thus, such a system is expected to get completed and promoted via strengthening teaching-learning system. The studies and theoretical basics indicate that goal orientation paves the ground for using learning strategies. On the other hand, these strategies, in turn, facilitate the students' learning process and academic achievement. And finally, the main goal behind performing the current research is to present an educational achievement causal model based on goal orientation and learning approaches.

Methods

The current study is descriptive (non-experimental) and the research design is a path analysis correlation because in this study the relationships among the variables are discussed in a causal model. The study participants consist of all Guilan Basic Medical Science University affiliated to Medical Basic Science and Dentistry students in 2012-2013 (n=295). The study sampling method was random clustering. At first, faculties, the courses of study, and the

classes were randomly selected. Besides, given the study of non-experimental and relational type, the sample size was estimated to be 175 subjects, using Cochran formula [121 (69%) medical basic sciences students and 54 (30.9%) dentistry students]. The inclusion criteria were: voluntary consents and interest to participate in the study andstudying at the basic science level. Having explained all the study goals and the confidentiality of the questionnaire's information to the participants, the study questionnaires were distributed among them to be completed. The GPA of the courses passed by the students during 8 semesters has been taken as the basic academic achievement indicator. The questionnaires applied in this study included three parts: demographics (gender, field of study), goal orientation scale developed by Bouffard et al. in 1995 and based on the scale designed by Armes and Archer (1998) to evaluate the kind of goal the individual chooses in academic situations (1, 27). This questionnaire encompasses three dimensions as learning goal orientation, performance goal orientation and failure avoidance goal orientation. The questionnaire's scale is of 6-point Likert type from "absolutely disagree "to "absolutely agree". This scale is made up of 21 options, 8 of which are on learning, 4 on performance, and 9 about failure avoidance. The questionnaire's validity has been verified in the research by Khademi and Noshadi (2006) and Jokar (2002) using internal consistency (28, 29). Its reliability has been achieved (0.83) for the factors as learning, (0.72) for performance and (0.85) for failure avoidance. To examine this study questionnaire's reliability, it has been implemented on 50 students and its reliability has been gained by alpha-Cronbach for learning factor as (0.84), for performance (0.78) and for failure avoidance (0.83).

The study process questionnaire (R-SPQ-2F) known as the "two-factor revised questionnaire form" has been designed by Biggs et al. to assess the students' learning approaches (30). The mentioned tool involving deep approach and surface approach assesses learning. Each approach is also made up of two dimensions as motivation and strategy and evaluates via twenty 5-point scale items (absolutely disagree to absolutely agree). In the study by Biggs et al., the reliability has been reported as 0.73 in deep approach and 0.64 in surface approach. In the research by Shokri et al., the validity of the tool has been obtained by the confirmatory factor analysis with goodness of fit as 0.06 and its reliability has been gained 0.79 and 0.83 for deep and surface learning approaches, respectively (31). The subjects answered the study questionnaires as a field and self-report. The data were analyzed using the statistical software SPSS, version 14, and Amos, version18, by applying statistical analyses at descriptive level (mean, standard deviation and Pearson correlation coefficient) and inferential level using the statistical tests (Structural Equation Modeling) the mediator analysis on Baron and Kenny's method (1986) to measure learning approaches' mediatory role in the relationship between goal orientation and academic achievement (32).

Results

Out of 175 participants in the current research, 76 were boys and 99 girls. About the field of study, 121 participants (72.8%) were studying in medical basic sciences and 54 (27.2%) in dentistry.

The study findings suggested that out of the predictor variables, failure avoidance goal orientation had a higher mean and in the mediator variable, the deep learning approach revealed a higher mean than the mediator variable. Table 1 presents further descriptions on the research variables. To analyze the study variables correlation, Pearson correlation test was applied.

The results showed that a significant positive correlation exists between goal orientation variables (learning goal orientation, performance goal orientation and failure avoidance orientation) and deep learning strategy ($P<0.05$). Moreover, the findings show that a significant negative correlation existed between learning orientation and performance orientation and surface learning strategy ($P<0.05$) and a meaningful positive association was observed between avoidance goal orientation and surface learning strategy ($P<0.05$). Moreover, a positive significant relationship was found between deep

Table 1: The study variables' descriptive indices

Study variables	Mean±SD	Min score	Max score
Academic achievement	1.66±14.99	10.8	18.6
Learning goal orientation	4.81±38.51	13	48
Performance goal orientation	6.02±40.75	9	24
Avoidance goal orientation	7.15±28.51	12	54
Surface learning approaches	7.153±28.51	12	45
Deep learning approaches	5.37±37.62	20	55

learning strategy and academic achievement (P<0.05) and a negative meaningful relationship between surface learning strategy and academic achievement (P<0.05).

The standard β coefficients resulting from the structural equations modeling for the study proposed model are also displayed in Table 2.

The structural model standard regression coefficients in this study are displayed in Table 3. As shown in the Table, there was a positive meaningful correlation between the dimensions of learning goal orientation and performance goal orientation and deep learning approach (P<0.05); also, there was a negative significant correlation between avoidance goal orientation and deep learning approach (P<0.05).

According to the results, the relationship between goal orientation components and academic achievement with the structural model based learning approaches mediating was examined using the Amos software. The mediating effect was confirmed, owing to the fact that the total effect was significant (P<0.05) and an indirect effect was signified as well (P<0.05). Finally, the direct effect between learning approaches and academic achievement was significant in 95% confidence level. The general indicators of goodness of fit index (GFI) test in Table 4 denote the model fitness.

After the analysis and applying some variations in the appropriate model, the following regression was yielded (Figure 1).

Table 2: The study correlation variables matrix

Study variables	Learning orientation	Performance orientation	Avoidance orientation	Deep learning approach	Surface learning approach	Academic achievement
Learning orientation	1					
Performance orientation	0.54**	1				
Avoidance orientation	0.61**	0.68**	1			
Deep learning approach	0.44*	0.25*	-0. 24*	1		
Surface learning approach	-0.38*	-0.32*	0.42*	-0.031*	1	
Academic achievement	0.46*	0.31*	0.28*	0.37*	-0.21*	1

**P<0.01; *P<0.05

Table 3: The study structural model standard βeta coefficients

Direction		Standard coefficients	P
Learning goal orientation	Surface learning approach	-0.352	0.050
Learning goal orientation	Deep learning approach	0.427	0.031
Performance goal orientation	Surface learning approach	-0.301	0.050
Performance goal orientation	Deep learning approach	0.248	0.043
Avoidance goal orientation	Surface learning approach	0.387	0.033
Avoidance goal orientation	Deep learning approach	-0.188	0.050
Surface learning approach	Academic achievement	-0.189	0.050
Deep learning approach	Academic achievement	0.342	0.044
Mediating effect: total effect		0.322	0.000
Mediating effect: indirect effect		0.231	0.000
Mediating effect: direct effect		0.281	0.000

Table 4: The revised model Adjusted Goodness of Fit Index (AGFI)

Index	Dimension	Optimal limit
X^2/df	0.4398	Less than 3
RMSEA	0	Less than 0.08
NFI	0.987	More than 0.9
GFI	0.994	More than 0.9
AGFI	0.981	More than 0.9

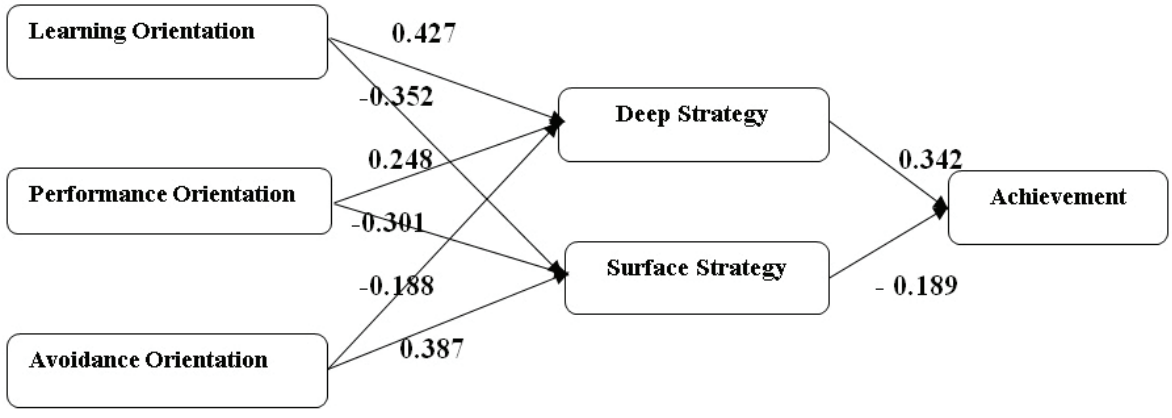

Figure 1: The final proposed model along with the directions coefficients

Discussion

The current study aimed to present an academic achievement causal approach based on the dimensions of goal orientation and learning in the first and second year students of the Medical and Dentistry schools of Guilan University of Medical Sciences. To sum up, the present study results demonstrate a relationship between goal orientation and its dimensions (learning, performance and failure avoidance) and academic attainment of the students. In other words, the sort of learning and academic goals these students have chosen is associated with their academic achievement. The students with learning and performance orientation have a higher level of learning and, consequently, higher academic achievement. This result is in the same line with the findings of Khademi, Jokar, Armes, Archer and Seifert's studies (28, 29, 33-35). Moreover, the results of the study conducted by Fang demonstrated that the students' academic achievement depends on not only the cognitive factors, but also the learning strategies (1); this is consistent with the current research findings.

The present study indicated that there was a positive significant association between learning and avoidance orientation. Wie-Wen's study showed that there was a significant relationship between learning and avoidance orientation and high-school students' performance; this corresponds with the recent findings. We have not found such a relationship in college, though (36), while it is against what Christopher found (37). These differences may be due to variety of educational environments and students' abilities, their desires and achievements.

The current study results revealed that there was a significant relationship between avoidance orientation and the total score of academic achievement. The failure avoidance orientation, the total academic achievement scores were significant. This means most of the students are inclined to avoid failure; there will be fewer changes in their academic attainment since such people selectively adopt the assignments leading them to short-term accomplishments. Besides, such students deal with assignments at a satisfactory level not the ones at good or excellent level. Avoidance-oriented person does not have an incentive to master the skill; she/he finds herself/himself incapable and avoids to reveal the progress that shows her/his inability. The results are in accordance with those of the studies by Bouffard, Harackiewicz and Heyman (27, 38-40).

The findings of this study showed a remarkable association between learning orientation and performance and academic achievement. It means that goals that students adopt in learning are linked with their academic achievement. Ames reiterates this issue indicating that there is a continuous relationship among goal orientation and performance and class structure, the type of the selected goal and the individual's vision of the assignments. Describing the class structure, Ames points out the assignment type or course content, classroom activities and evaluation

methods proportionate to the learning structure and training and asserts that these factors influence the learner's goal and performance orientation (33).

People who are performance-oriented try to achieve good grades or make others pleased (41). This standpoint about education and learning illustrates that the more interaction the courses have theoretically and practically, the more stress the person will get about deeper and meaningful learning. Also, the learners are seeking the significant and purposeful association between learning content, their inclination to assignments and appraisals during education period. Such meaningfulness and purposefulness will associate them with their work environment and real world. This approach is consequently one of the most common features of educational system, in particular of medical disciplines, so that they get more sensitive in medical disciplines due to the services such individuals provide.

The findings revealed a meaningful association between the students' learning approaches and its dimensions (surface and deep) and academic achievement. Results showed that there was a positive relationship between deep learning approaches and academic achievement and also a negative significant relationship between surface learning and academic achievement. According to recent researches, students who have a tendency toward deep approach enjoy a higher academic achievement compared to those who have a tendency toward superficial approaches. However, the students' progress with a tendency to deep approach could be due to the fact that the learner with a deep approach during learning raises some questions for her/himself about learning content, and she/he spends her/his leisure time in order to better understand the interesting topics discussed in different classes. Therefore, she/he has better academic achievement, but perhaps excessive workload in the university curriculum causes the students to tend to surface learning to pass the assessments (42). Thus, they study the materials by superficial review, the reproduction of knowledge and the fear of failure in exams (43).

According to the theory proposed by Cano (44), using the surface approach, the learner makes the least efforts for high level academic goals. The results of Shahrabadi's study entitled "the relation between learning and study strategies and academic achievement of Rafsanjan Medical University students" are consistent with those of the present study (45). However, Diseth reported in an investigation that he unexpectedly did not anticipate the relationship between academic achievement and deep approach (46). Richardson also stated that academic achievement was not associated with deep approach, but it had an inverse relationship with the superficial approach (47).

The results of the studies conducted by Tunde, Saddle-Smith, Zhang and Shokri are consistent with those of this research (10, 31, 48, 49).

The current research results indicated that each of the dimensions of goal orientation and learning approaches has the potential to predict the students' academic achievement. The test results of this hypothesis are consistent with the studies conducted by Birenbaum, Miller et al. and Miller and Greene (44, 50, 51). However, it is worth mentioning that this prediction is not significant for surface strategy subscale and lacks the potential to predict the students' academic attainment and it only accounts for 0.09% of academic achievement. This test result matches those of the studies by Nicholls, Miller and Sedaghat (52-53). To interpret the above result, it can be stated that the more the students use deep strategies, the more their progress in learning and understanding the content including the concepts and their accomplishments in evaluation will be guaranteed. The ones virtually having learning goals in achieving success look for the assignments with the optimal level of intellectual challenge and employ the solution of such challenges to satisfy their educational motives and success.

Being confronted with high level intellectual assignments, the students with learning orientation act systematically. In an effort to fulfill challenging tasks, they use deep processing strategies which increase the sense of success and effort

Conclusion

Results showed that the students' academic achievement model fits the experimental data, so it can be used in learning principles which lead to students' achievement in learning. Based on the current research finding on the role of goal-orientation on learning, especially among medical and dentistry students, it can be suggested that the educational planners should provide a learning situation in a way that students can go toward learning goals and be away from avoidance goals. Educational authorities suggest that the ground for the students' promotion and avoidance of failure should be provided. They also identify the students' learning approach with appropriate assessments and help them tend to deep approach by proper educational treatments and proper programs, such as holding workshops.

Limitations

Of the limitations of the present study, we can mention the statistical community was confined to the medical basic sciences and dentistry students and that the probable difference may lower the generalization of the findings among other groups and only dependence on self-rating induced information can be pointed out, as well.

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