ORIGINAL ARTICLE

CORRELATION BETWEEN COURSE INTEREST, SELF-DIRECTION AND ASSESSMENT SCORES FOR DETERMINING MOTIVATION OF MEDICAL AND DENTAL STUDENTS IN PAKISTAN

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ABSTRACT

Intrinsic and extrinsic motivation is required for task engagement, good performance and achievement. The purpose of this study was to determine the correlation between extrinsic motivating factors of a course and intrinsic motivation of medical and dental students as measured by their self-direction aptitude and to determine their relationship with academic achievement.

A quantitative cross-sectional study was conducted on two hundred and twenty female medical and dental students at a private medical college. Data was collected for first term exam results and on Course interest survey tool (CIS) and self-direction aptitude survey tool (SDLAS).

Pearson's correlation between CIS and SDLAS was 0.377 ($p<0.01$). The correlation between SDLAS scale and First Term examination results was 0.166.

First term exam may not have given good correlation with CIS and SDLAS as compared to professional exam. Assessment type might have affected the result. This study identified the need for faculty training in self-efficacy, feedback, criterion referenced assessment and instructional methods which promote self-directed learning.

Key Words: *Motivation, Assessment, Correlation, Self-Direction, Course interest, Intrinsic motivation, Extrinsic motivation.*

INTRODUCTION

Motivation is a quality that moves us to do something. Intrinsic motivation appears because of personal interest, due to inherent nature of task and the satisfaction it provides but reinforcements are required for extrinsic motivation. Contemporary educationists are in favor of intrinsic motivation as it leads to better outcomes than extrinsic motivation,[1] maintains effort toward learning and the achievement of cognitive goals.

Self-Directed Learning Theory is related to Bandura's Social Cognitive Theory, and involves iterative cycles of forethought, performance, and self-reflection. Learner initiate the learning process and task motivation is what keeps the learner on task. It also incorporates metacognition as an awareness of one's own learning. Some specific ways to introduce self-direction are by problem based learning, case based small group sessions, collaborative learning with mixed ability groups, and reflections using portfolios.[2] Self-directed individuals initiate the learning process by developing learning goals based on their learning needs, determining resources required, planning their learning and evaluating the outcomes.[3,4] An important benefit of this approach is that it can address the persistent problem of the growth of knowledge in medical education, described as "curriculum hypertrophy".[5] Requirements of accrediting bodies nationally and internationally requires that learners become lifelong learners hence self-directed learning is necessary for lifelong learning for medical graduates[6] as the purpose of education is no longer transmission of knowledge.[7-8]

Motivation is also defined as goal directed activity and assessment can be done to determine if the expected goals have been mastered or it can be done to measure performance in comparison to others.[9] In mastery, performance effort has an important role compared to ability.[10] Greater effort followed by success increases self-efficacy, and personal accomplishment for moderately challenging tasks. Motivation is enhanced if assessment is task or goal focused, than when the outcome of assessment is outperforming others. Several instruments exist for measurement of

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motivation. Course Interest Survey (CIS) and Self-Directed Learning Aptitude Scale (SDLAS) are tools to measure motivation. Purpose of this study was to determine if there is a correlation between motivation of students as measured by CIS, their Self-Direction Aptitude as measured by SDLAS tool and academic result. We hypothesized that there is correlation between motivation of students as measured by CIS, their Self-Direction Aptitude as measured by SDLAS and academic achievement.

METHODOLOGY

The study was conducted at Women Medical College, Abbottabad from September 2014-September 2015. It was a cross sectional quantitative study. Ethical approval for the study was received from Institutional Review Board, and consent was taken from study participants. Convenient method of sampling was used and data was collected on previously validated course interest survey tool (CIS) and self-directed learning aptitude survey tool (SDLAS) from students of all classes of MBBS and BDS. Two hundred and twenty students who agreed to participate in the study and completely filled the two survey forms were kept for data analysis. Incompletely filled forms and forms without signed consent were excluded. The data was analyzed on SPSS version 22.

RESULTS

Pearson's product-moment correlation (*r*) was used to assess the strength of linear relationship between CIS scale, its subscales, SDLAS scale and exam percent marks. Sums of the subscales were used for calculating the correlation. Percent marks were taken for academic score (Table 1). The correlation between CIS scale and its subscales Attention, Relevance, Confidence and Satisfaction to percent scores obtained in the term examination, r (218) = 0.083, 0.094, -0.031, 0.128 and 0.094 (p >.01) respectively (Table 1). CIS contributes 0.69%, Attention .88%, Relevance .096%, Confidence 1.64% and Satisfaction 0.88% of the correlation in exam percent marks. CIS scale had a correlation of r (218) =0.377 (p<0.01) with SDLAS Scale. Attention had a correlation of 0.248, 0.280, 0.236 (with a p of <.01) with all three subscales of SDLAS, that is Self-Management, Motivation and Self-Monitoring, respectively. Degree of freedom DF (n-2) = 220-2=218, where n=number of participants in the research. The Co-efficient of determination (r2) explained 6.1%%, 7.84 %, 5.56% of correlation in the Attention subscale by subscales Self-Management, Motivation, Self-Monitoring. Attention had a correlation of 0.308with SDLAS scale. Relevance subscale had a correlation of 0.320 with Motivation subscale of SDLAS, 0.236 with Self- Monitoring subscales of SDLAS scale, (p <.000). r2 defined 10.24%, and 5.57% of correlation in Relevance by subscales Motivation and Self- Monitoring. Relevance had a correlation of 0.277 with SDLAS scale. Confidence had a correlation of 0.245 (p <.01) with Motivation subscale of SDLAS. 6% of correlation in confidence subscale was by the subscale Motivation. The correlation between Confidence and SDLAS scale was 0.203. Satisfaction had a correlation of 0.296 and 0.245 with the Motivation and Self-Monitoring subscales, respectively. There was a correlation of 0.282 between satisfaction subscale and the SDLAS Scale. The correlation between the Relevance (CIS) and Self-Management subscales (SDLAS), was 0.160, Correlations for Confidence with Self-Management and Self - Monitoring subscales of SDLAS were (p >.01) 0.132 and 0.134 respectively, and that between Satisfaction with Self - Management was 0.159.

The correlation (p>0.01) between SDLAS scale and the term examination result was 0.166, The correlation between the Subscales Self-Management, Motivation and Self-Monitoring with the Term Examination Results were 0.154, 0.192 and 0.077 respectively.

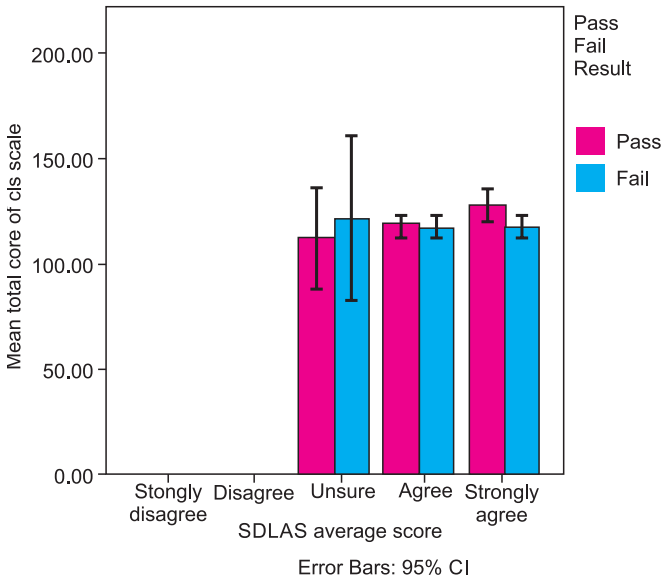

Fig 1: Relationship between CIS Score, SDLAS Score and Pass Fail Examination Result

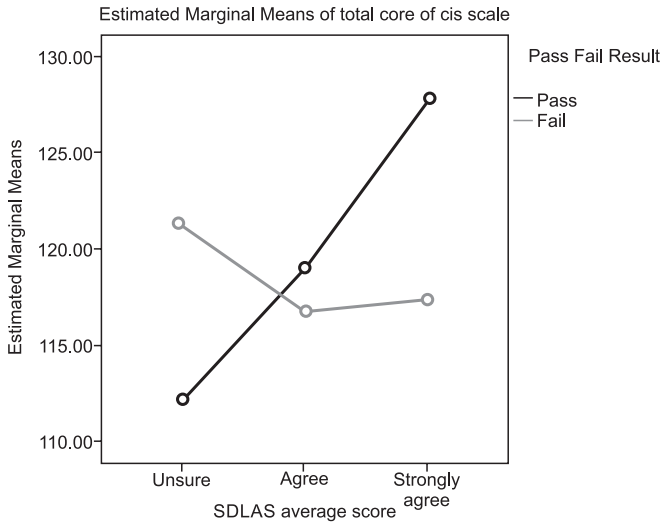

Fig 2: Profile plot for 220 Students for Interaction between SDLAS and Pass Fail Result for Estimated Marginal Mean Score of CIS Scale

TABLE 1: PEARSON'S CORRELATION BETWEEN CIS SCALE, ITS SUBSCALES, SDLAS SCALE, ITS SUBSCALES AND EXAMINATION RESULTS

	Attention	Relevance	Confidence	Satisfaction	Percent marks	SDLAS	CIS	Self-Management	Motivation	Self-Monitoring
Attention	1	.547**	.390**	.518**	.094	.308**	.794**	.248**	.280**	.236**
Relevance	.547**	1	.563**	.670**	-.031	.277**	.861**	.160*	.320**	.213**
Confidence	.390**	.563**	1	.553**	.128	.203**	.722**	.132	.245**	.134*
Satisfaction	.518**	.670**	.553**	1	.094	.282**	.849**	.159*	.296**	.245**
Percent Marks	.094	-.031	.128	.094	1	.166*	.083	.154*	.192**	.077
SDLAS	.308**	.277**	.203**	.282**	.166*	1	.337**	.812**	.816**	.838**
CIS	794**	.861**	.722**	.849**	.083	.337**	1	.222**	.355**	.263**
Self-management	.248*	.160*	.132	.159*	.154*	.812**	.222**	1	.532**	.490**
Motivation	.280**	.320**	.245**	.296**	.192**	.816**	.355**	.532**	1	.525**
Self-monitoring	.236**	.213**	.134*	.245**	.077	.838**	.263**	.490**	.525**	1

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

TABLE 2: COMPARISON OF PASS FAIL RATINGS WITH SCORES OBTAINED ON CIS AND SDLAS BY MULTIPLE MEANS ANOVA

Dependent Variable: Total score of CIS scale

SDLAS average	Pass Fail score result	Mean	Std. Deviation	N
Unsure	Pass	112.20	19.89	5
	Fail	121.25	24.40	4
	Total	116.22	21.06	9
Agree	Pass	119.04	15.38	114
	Fail	116.80	15.02	65
	Total	118.22	15.24	179
Strongly agree	Pass	127.72	17.67	25
	Fail	117.43	4.85	7
	Total	125.47	16.28	32
Total	Pass	120.31	16.24	144
	Fail	117.09	14.81	76
	Total	119.19	15.79	220

No significant correlations were found for term examination result with CIS and SDLAS scale and their subscales. Comparison of pass fail scores with scores obtained on CIS and SDLAS scales showed that all students, irrespective of whether they passed or failed in the examination, showed a higher interest in course, when they were strongly self-directed (Fig 1). Comparison of pass fail scores with scores obtained on CIS and SDLAS (Table 2) and cluster bar chart (Fig 1) showed that the two groups of students who agreed and strongly agreed with the self-directed learning aptitude, obtained higher scores in the term examination. There was a higher interest in the course in students who passed compared to those who failed. One hundred and forty-four students passed the academic term examination with a mean score on CIS of 119.2±15.7 SD, seventy-six students failed (mean 120. 3±15S.D) the examination. One hundred and seventy-nine students agreed with self-direction (mean 118±15S.D). Among this group of students one hundred and fourteen passed (119±15S.D) and sixty-five failed the term examination (116±15S.D). Thirty-two students strongly agreed with self-direction (125±16S.D). Among these students twenty-five passed (127.7±17.7S. D) and seven failed (117. 4±5S.D). Only nine students were unsure about their self-direction aptitude (Table 2) Twenty-five students who strongly agreed with self-direction passed the examination, and had higher estimated marginal mean score on CIS and the interaction was significant 7.2453±2.997, p=0.043<0.05. This was seen in the disordinal interaction where the lines crossed each other in the profile plot of 220 students (Fig 2). Profile plot indicated that there was a sharper increase in strongly agreed SDLAS average score for estimated marginal mean score of CIS for students, who passed the examination compared to those who failed.

DISCUSSION

No correlation was found for CIS scale and its subscales with WMC exam results. Correlation of 0.47 was found between the CIS scale its subscales and examination result in the previous study. Another study carried out in Pakistan did not detect predictive validity between motivation and academic performance using "Strength of Motivation for Medical School Questionnaire" (SMMS).[11]

Pearson's Correlation was only 0.377 between motivation of students as measured by CIS scale and their Self-Direction Aptitude as measured by SDLAS scale. No significant *(p>0.01)* correlations were found between CIS scale and its subscales, SDLAS scale and its subscales to term examination. However, a comparison of pass / fail results showed students who strongly agreed to Self-Direction and passed the examination scored more on CIS scale. A study conducted in Pakistan showed similar results.[12] The two constructs "motivation for course" and "academic success" in first term as measured by the CIS scale and first term examination result, did not correlate with each other in this study. A small correlation (0.377) between Course Interest measured by CIS subscales and Self-Direction Learning Aptitude measured by SDLAS subscales indicate a lack of *absolute convergent* validity of CIS scale. CIS correlated with SDLAS. It may mean that they are truly correlated. However, we cannot rule out a phenomenon referred to as "halo effect". It can be decreased by using of one scale instead of two separate scales to measure correlated phenomenon.[13] In this study, first term examination focused on demonstrating competence or ability in relation to other students. Students striving for such a goal have beliefs about their self-efficacy or ability. When a student fails, their belief about their ability to perform decreases resulting in decreasing effort and decreasing performance and hence initiating a vicious cycle. Self-directed students can break this by management and evaluation of their own learning.[14,15] This notion is supported by findings of this study. We found that students who had a self-directed approach to learning showed more interest in their course and also passed the examination. The pattern of relationships which appeared in this study provide insight into what motivates the students to take responsibility of their own learning and become self-directed learners but could not establish a cause-and-effect relationship. CIS appears to tap factors from Self-Direction Aptitude which is a related but non-observable concept, and might have measured motivation due to self-direction or self-regulation besides motivational factors in the course. The correlations showed that when Students' Attention score highly correlated with self-direction aptitude, indicating that when their Attention was high their self-direction aptitude increased. Relevance and Attention to course motivated the students to enter the task (motivation), and take cognitive responsibility of learning (self - monitoring). This study showed correlation between Confidence of ARCS model and Motivation subscale of Garrison's Model of Self-Direction. To raise the level of Confidence and hence Motivation, teachers can help the students to put in efforts by designing challenging tasks and assignments of moderate difficulty and teaching in small groups.[16] Such tasks generate the right amount of anxiety which does not cause task avoidance and demotivation. Teachers' beliefs about their ability as teachers directly influences students' efficacy. Highly efficacious teachers spend time helping students to persist on the task. The teachers can also identify their students' self-efficacy beliefs. Those students with positive efficacy beliefs should be given opportunity to determine their own learning objectives after identifying their personal learning needs when learning new things, by critically evaluating new ideas and knowledge and paying attention to details before making a decision.[3] Metacognitive strategies[17] should be utilized by learners to manage their learning, and achievement of tasks before receiving constructive feedback from their instructors. Students with low self-efficacy can be grouped with high efficacy students in a collaborative learning environment which includes Problem Based Learning. It is the role of the teachers to align tasks and teaching with learning, such that it guides self-direction of students for the appropriately

challenging tasks of moderate difficulty to boost their Confidence and hence motivate the students to achieve the goals. Similar results were obtained in a study conducted by Sohail et al.[18] Small to medium correlations were present between Satisfaction, Motivation and Self-monitoring. Self-Monitoring is a process of learning in a self- directed learner. It is a metacognitive strategy which learners use to monitor their own learning and motivational dimensions. To increase satisfaction in students while learning in collaborative environment, metacognitive strategies can be used[23] in turn promoting motivation. Students should be helped to understand what is expected of them by providing well defined objectives and clear feedback on assessment.[19,20] They should be given opportunity to evaluate courses to improve their perception about locus of control[21]. Extrinsic rewards such as money, certificates, grades, awards should be used sparingly because if used too frequently, their reinforcing value would decrease.[22] One method to introduce equity or fairness in classroom will be to take tests or assessments, which includes content that was taught, and was at level of difficulty relevant to the group of students. A study measured, motivation of science and non-science college students, using Glynn Science Motivation Questionnaire II.[23] This tool had a reliability of 0.92. It assessed intrinsic motivation, self-efficacy, career motivation and grade motivation based on Social Cognitive Theory. The study concluded that these components have a role in students' achievement and also identified self- efficacy and Self-direction important for increasing motivation to course.

CONCLUSION

Correlations were found between subscales of CIS and SDLAS. However, this study does not support that high scores of CIS or SDLAS translate into high scores on term examination. The study was conducted at one medical school comprising of females only hence results cannot be generalized.

REFERENCES

1 Deci EL, Koestner R, Ryan RM. A meta-analytic review of experiments examining the effects of extrinsic rewards on intrinsic motivation. Psychological Bulletin. 1999; 125 (6): 627-68.

2 White CB, Gruppen LD. Self-regulated learning in medical education. In T. B. Swanick (Eds.), Understanding medical education: Evidence, theory, and practice. Oxford UK: Wiley Blackwell; 2010. P. 271-82.

3 Fatah A. Garrison's model of self-directed learning: Preliminary validation and relationship to academic achievement. The Spanish Journal of Psychology. 2010; 13(2): 586-96.

4 Knowles MS. Self-directed learning: A guide for learners and teachers. Englewood Cliffs, New Jersey: Prentice Hall; 1975.

5 Abrahamson S. Diseases of the curriculum. Journal of Medical Education. 1978; 53(12): 951-57.

6 Harvey BJ, Rothman AI, Frecker RC. Effect of an undergraduate medical curriculum on students' self-directed learning. Academic Medicine. 2003; 78(12): 1259-65.

7 Majumdar B, Roberts J, Knechtel R, Noesgaard C, Campbell K, Tkachuk S. Comparison of Self- and Faculty-Directed Learning of Psychomotor Skills. Advances in Health Sciences Education: Theory and Practice. 1998; 3(1): 15-28.

8 Norman G. The decline and fall of the art of teaching. Adv in health sci edu. 2013; 18(5): 860-71.

9 Graham S, Weiner B. Theories and principles of motivation. In D. C. Berliner & R. C. Calfee (Eds.). Handbook of Educational Psychology. New York: Macmillan; 1996. P. 63-84.

10 Ericsson KA. The influence of experience and deliberate practice on the development of superior expert performance. In K. A. Ericsson., N. Charness., P. Feltovich & R.R. Hoffman (Eds.), Cambridge handbook of expertise and expert performance. Cambridge: Cambridge University press; 2006: 39-68.

11 Luqman M. Relationship of academic success of medical students with motivation and preadmission grades. Journal college of Physicians and surgeons Pakistan. 2013; 23(1): 31-36.

12 Riaz F, Yasmin S, Yasmin R. Introducing regular formative assessment to enhance learning among dental students at Islamic International Dental College. J Pak Med Assoc. 2015 Dec;65(12):1277-82.

13 Streiner DL, Norman GR. Health Measurement Scales: A Practical Guide to their Development and Use. 3rd ed. New York: Oxford Medical Publications; 2007.

14 Bruning RH, Schraw GJ, Norby MM, Ronning RR. Beliefs about self. In K.M. Davis (Eds), Cognitive psychology and instruction. 4th ed. New Jersey: Pearson Prentice Hall, 2006. P 65-91.

15 Rehman R, Khan R, Akahai MA, Hassan F. Approach of freshly-inducted medical students towards learning at Bahria University Medical & Dental College. J Pak Med Assoc. 2013 Mar;63(3):320-3.

16 Ahmed T, Shaheen A, Azam F. How undergraduate medical students reflect on instructional practices and class attendance: a case study from the Shifa College of Medicine, Pakistan. J Educ Eval Health Prof. 2015 Mar 22; 12:7.

17 Frith CD. The role of metacognition in human social interaction. Philos Trans R Soc Lond B Biol sci. 2012; 367(1599): 2213-23.

18 Sohail N. Stress and academic performance among medical students. J Coll Physicians Surg Pak. 2013 Jan;23(1):67-71.

19 Rauf A, Shamim MS, Aly SM, Chundrigar T, Alam SN. Formative assessment in undergraduate medical education: concept, implementation and hurdles. J Pak Med Assoc. 2014 Jan;64(1):72-75.

20 Hamid Y1, Mahmood S. Understanding constructive feedback: a commitment between teachers and students for academic and professional development. J Pak Med Assoc. 2010 ;60(3):224-27.

21 Cain J, Romanelli F, Smith KM. Academic entitlement in pharmacy education. Am J Pharm Educ. 2012; 12(76): 189.

22 Ericsson KA. The influence of experience and deliberate practice on the development of superior expert performance. In K. A. Ericsson., N. Charness., P. Feltovich & R.R. Hoffman (Eds.), Cambridge handbook of expertise and expert performance; Cambridge: Cambridge University press;2006. P. 35-68.

23 Glynn SM, Brickman P, Armstrong N, Taasoobshirazi G. Science motivation questionnaire II: validation with science majors and non-science majors. J Res Sci Teach. 2011; 48(10): 1159-76.

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