

Effect of Academic Self-efficacy and Motivation on achievement in Chemistry at Secondary level*Dr. Muhammad Younes¹, Ms. Tahira Ellahi²***ABSTRACT****Keywords:**

Self-Efficacy, Motivation, Content Knowledge Confidence, Students' Achievement.

The study was undertaken to explore the impact of self-efficacy and motivation of secondary school students on their achievement level in Chemistry at secondary level. Self-efficacy of students, their motivational level and their confidence in Content Knowledge were taken as variables. All the secondary schools of Khyber Pakhtunkhwa were the universe of the study. 240 Secondary level students were randomly selected as sample of the study. The scales "Motivated Strategies for Learning Questionnaire" (MSLQ) and "Content Knowledge were used as research instrument. The Motivated Strategies for Learning Questionnaire (MSLQ) was used to measure two variables i.e., Self-efficacy (SE) and Motivation (MOT), whereas, Content Knowledge Confidence Survey was used to measure the level of confidence and the same test was used to measure the achievement level of secondary school students (here students' score). The Pearson's correlation results for Self-efficacy and Students' Achievement estimated at $r=.317$ at $p<.001$; while Content Knowledge Confidence with Students' Achievement estimated at $r=0.312$ ($p<0.001$), showing positive relationship. Meanwhile, the results showing a moderate positive relationship of motivation with students' achievement i.e., $r= 0.24$ ($p=0.000$).

INTRODUCTION

Secondary school score forms the base academic career of an individual. Student's achievement score is proof of his/her capability. The motivation leads an individual to work hard whereas self-efficacy brings out instinctive capability to acquire best results. All subjects' score has their own significance in the cumulative score at the summative assessment. Students' self-efficacy and motivation helps in enhancement of prospects of their achievement level in evaluation and assessment.

Chemistry is supposedly a difficult subject (Cousin 2007), even for its likes, yet, it is mandatory to qualify it at SSC level. Chemistry is an integral part of science syllabus at the secondary level and a pre-requisite for entry into medical colleges. The syllabi of chemistry stimulate the intellectual skills, which are important for additional knowledge in other science branches (Taber 2002).

Andersson and Wallen (2006), consider motivation of students as a pre requisite for learning any subject. Theory of self-determination (Deci and Ryan, 1985), postulates that motivation affect the level of accomplishment of learners. Self-efficacy is also a significant factor which enhances the achievement level of students (Bandura 1986).

The confidence in content knowledge adopted from Wu Xn (2013), is considered an important factor in students' academic achievement. Shoemaker (2011) considers confidence as a psychological trait that measures one's belief in one's own capabilities. Confidence self-efficacy; are interrelated but confidence is more general than self-efficacy. Sander and Sanders (2005), found that a confident child has a high

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level of academic achievement while less confident may not come up to the required level of accomplishment. Students with a low level of confidence are found to be less involved in solving transitional difficulties.

Research Objective

The main objective of the study was to determine the correlation between self-efficacy, motivation and content knowledge confidence with students' achievement at secondary level.

Hypotheses

The following hypotheses were designed to tested:

H₀:1 There is no relationship between self-efficacy and students' achievement.

H₀:2 There is no relationship between motivation of students' and achievement.

H₀:3 There is no significant relationship between content knowledge confidence of Students' and their achievement.

Conceptual Framework

The concept of self-efficacy and motivation revolves around Social Learning Theory. This theory is based on four processes, Bandura (1989) goal realization: self-efficacy, self-observation, self-evaluation, and self-reaction. These factors are interrelated and each one effects goal attainment and motivation (Redmond, 2010). Bandura (1961) holds that behavior and environment interact with each other. The people who regulate and assess their learning processes set goals. Hence Self-efficacy and Motivation moderate their learning behavior whereas motivation boosts them up to work hard to achieve their set goals.

Pintrich and DeGroot (1990) determined that self-efficacy and motivation promote the students' achievement, which can be measured by an instrument, i.e.; Motivated Strategies for Learning Questionnaire (MSLQ). Additionally, self-confidence is an important variable in students' academic achievement. Nuhfer and Knipp (2003) developed a scale known as Knowledge Survey based on self-efficacy concepts, the results of which reveal students' learning and their confidence level.

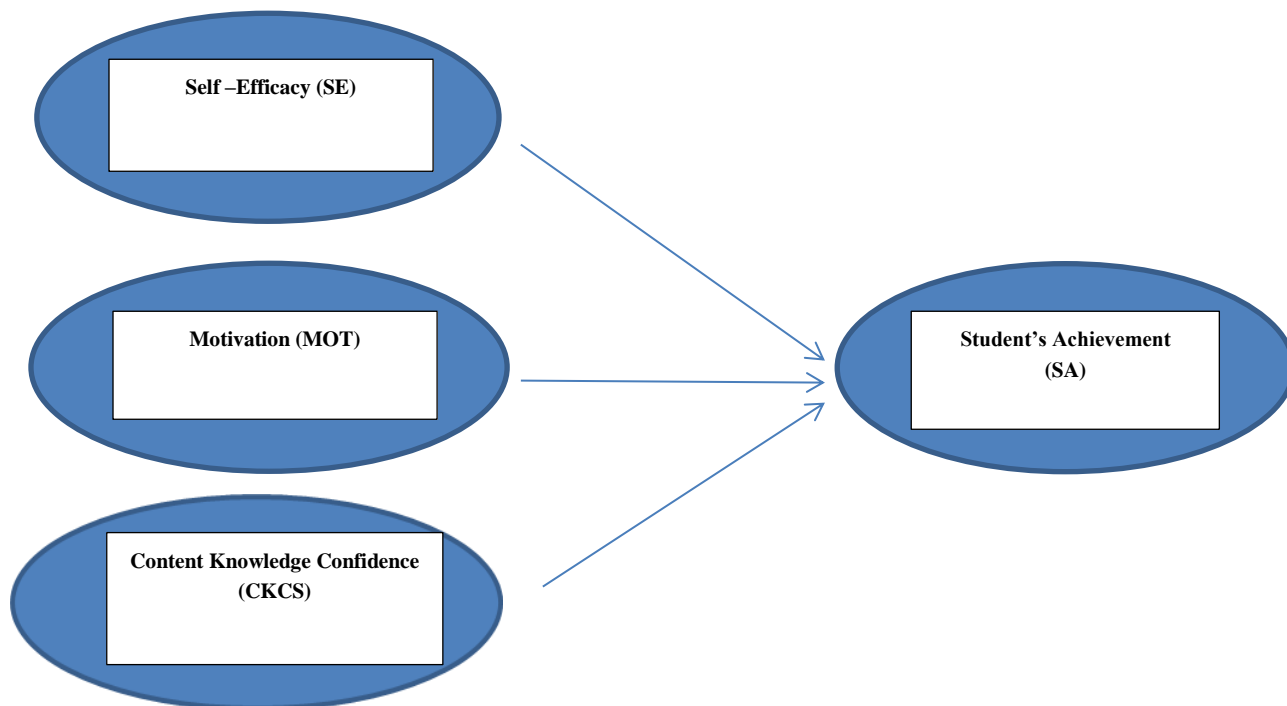


Fig: Conceptual Framework

MATERIALS AND METHODS

The present study being quantitative used two instruments Motivation Strategies for learning questionnaire (MSLQ) and content knowledge confidence survey (CKCS). Both of these measuring instruments have been measured to reach high-reliability requirements, which is a prerequisite for obtaining valid results (Duncan & McKeachie 2005). Study consists of all secondary school students of class 10 in KPK whereas 240 randomly population of study selected 10th class students, constitute the sample of the study.

The MSLQ, was used to measure two variables i.e. motivation level and self-efficacy. Whereas CKCS scale was used to ascertain the confidence level of students in the course content taught to them in class 9th, marked with the help of given key. So, the obtained marks were put in the spread sheet by using SPSS version 23.

The two independent variables were tested for reliability in terms of Cronbach's Alphas, which was from acceptable to good ranges as given in table 1.

ANALYSIS AND DISCUSSION

Table 6.1: Results of Reliability test

Variables	Cronbach's Alpha
Self-Efficacy (SE)	0.80
Motivation (MOT)	0.81
Content Knowledge Confidence Scale (CKCS)	0.71

The reliability test given, in table 6.1, indicated Cronbach's Alpha for SE and MOT falling in good range, whereas Cronbach Alpha for CKCS is in unacceptable range.

Pearson's Correlation

Pearson Correlation test was applied to determine the relationship between the variables. Results of Pearson's Correlation between Students' Self-efficacy and their test achievement are given as per table 6.2 below:

Table 6.2
Correlations

		SA	SE
SA	Pearson Correlation	1	.317**
	Sig. (2-tailed)		.000
	N	237	237
SE	Pearson Correlation	.317**	1
	Sig. (2-tailed)	.000	
	N	237	237

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

The results of Pearson's Correlation gave the coefficient $r = .317$; $p = .000$, suggested a moderate positive relationship between self-efficacy and students' achievement. The result shows that increased self-efficacy of the students contributes towards student's performance. So, the results indicated the rejected null hypothesis 1.

Table 6.3. Results of Pearson's Correlation between Students' Motivation and their achievement test.

<i>Correlations</i>		SA	MOT
SA	Pearson Correlation	1	.236**
	Sig. (2-tailed)		.000
	N	237	237
MOT	Pearson Correlation	.236**	1
	Sig. (2-tailed)	.000	
	N	237	237

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

Pearson's Correlation test applied to determine the relationship between Students' Achievement and Motivation indicated is equal to $r = .236$ at $p < .01$ which is considered as a weak relationship. Therefore, the hypothesis No.2 indicating a no relationship between motivation and students' achievement was rejected.

Table 6.4. Results of Pearson’s Correlation between Students’ achievements with Content Knowledge Confidence Survey.

Correlations

		SA	CKCS
SA	Pearson Correlation	1	.312
	Sig. (2-tailed)		.000
	N	237	237
CKCS	Pearson Correlation	.312	1
	Sig. (2-tailed)	.000	
	N	237	237

As seen on table 6.4, indicated the Pearson's correlation between students’ achievement and content knowledge confidence (CKCS), was about $r=.312$, different from zero at $p<.01$, suggested a direct relationship between the interested variables. The following results help us to reject the null hypothesis “as there is a positive relationship of content knowledge confidence with students’ achievement.

CONCLUSION AND RECOMMENDATION

Conclusions

The discussed results help us to draw the following conclusions:

1. The study confirmed that there is a positive and statistically positive relationship between student’s efficacy and their achievement level.
2. the study established that student’s motivation and their achievement level are positively correlated.
3. The study yielded that students’ knowledge confidence and their achievement is positively correlated.

Recommendations

The study also concluded that students has self-efficacy in their taught concepts, but they were not adequately motivated towards high level of achievement which need attention. Achievement level of students can be enhanced by motivating them applying the following measures:

- Conducive school climate may be created for enhancing motivation level of the students.
- The teaching-learning process may provide, students’ participation/interaction leading to motivation.
- Self-efficacy may be inculcated among the students through motivation and generating confidence by effective teaching.
- Student-Centered approach may be provided for interactive teaching-learning process.

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