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A CORRELATIONAL STUDY OF TEACHERS' CONCEPTIONS OF ASSESSMENT AND STUDENTS' ACADEMIC ACHIEVEMENT

Abstract

Present study investigated the influence of teachers' conceptions on students' academic achievement at secondary level. The study utilized correlational descriptive survey for identifying teachers' conceptions and their students' achievement in the four districts of Lahore division. Teachers' Conceptions of assessment were explored through Conceptions of Assessment survey developed by Brown, Hui, Flora & Kendy., (2011), whereas students' scores in their subjects constituted the second variable of study. Collected data was analyzed through AMOS and SPSS (standard deviation, correlation and regression analysis). Findings of the study disclosed teachers' moderate agreement towards improvement and accountability conceptions while showing strong disagreement for irrelevance conception of assessment. The conceptions were found being mutually related having significant effect on students' academic achievement. The study revealed teachers' understanding towards various purposes of assessment while exploring the ones influencing students' achievement at secondary level. The findings have implications for policy makers and teacher training programs.

Key words: Conceptions of assessment, academic achievement, secondary education, secondary schools

Introduction

Teachers' decisions in their professional practices influence the overall environment of the classroom with a positive or negative impact on students learning (Kauchak & Eggen, 2007; Borich, 2014). They are an important element in the process of students' learning. Accordingly, a good deal of evidence has been reported detecting the effect of teacher related variables such as qualification, experience, personality, IQ, classroom practices and teacher effectiveness on students' learning. Though, the results of such studies have not been consistent in relation to the discovery of strong relationship of the constructs (Goe, 2007). Therefore, researchers despite characteristics of teachers, focused behavior as found to be significantly linked with students' learning outcome (Araujo, Carneiro, Cruz-Aguayo, & Schady, 2014). Considering the fact that behaviors are the reflections of hidden belief systems, it may be concluded that teachers' believes would have an effect on students' learning.

These believes would be one of the possible and valid causes of teachers' varied behaviors towards different components of teaching learning process. While these become the reason for varied students learning outcomes as well. Scholars argue that teachers' perception and practice of excellent teaching depends on how he/she conceptualizes it (Biggs, 2012). Consequently, teaching behavior of teachers' encompassing perceptions and student evaluations are influenced by their belief system regarding teaching, learning, curriculum, assessment and self-efficacy (Brown, 2003).

Beliefs working as clusters form conceptions, whereas the word conception is a broader term that consists of an organized system of beliefs (Remesal, 2011). It includes the knowledge and beliefs of a person which affect the formation of conceptions (Elliot & Chan, 2004). This clarification is quite helpful to avoid any operational issues that might emerge as a result of scholars' attempts to differentiate between belief and conception (Barnes et al., 2017). In order to explore teachers' conceptions about assessment, actual purpose behind an assessment event was investigated (Brown, 2008; Black and William, 1998). The literature showed three different purposes for which the assessment events were arranged (Black & William 1998; National Research Council, 2001; Torrance & Pryor, 1998), including improvement, accountability of schools and accountability of students. Another fourth purpose was observed among teachers that showed assessment as an irrelevant activity for teaching learning process. This purpose has been named as irrelevance (Shohamy, 2001). According to Brown (2012), the objectives and intentions regarding assessment develops teachers' perception for assessment.

Brown in (2003) developed a model of conceptions of assessment as a result of qualitative and quantitative iterative studies conducted on primary and secondary school teachers. It was based on four major inter-acting

aspects related to assessment such as improvement, irrelevance, school accountability and student accountability. It was found that possession of these varied conceptions among teachers leads to different types of assessment practices in classroom.

Teachers' conceptions regarding assessment can be categorized into four segments naming:

- I. Assessment improves teaching and learning
- II. Assessment makes students accountable for learning
- III. Assessment makes schools and teachers accountable and
- IV. Assessment is irrelevant (Brown, 2002; Torrance & Pryor, 1998; Brown, 2005).

In the mentioned above conceptions, three can be categorized as purposes and fourth as anti-purpose (Brown, 2008). The anti-purpose is a belief based on the views that assessment is irrelevant to the life and work of teachers and students (Shohamy, 2001).

It is evident in literature that in order to bring a positive change in students' learning outcomes; the educational practices of teachers should be transformed accordingly which is possible via introducing a change in their instructional conceptions. In order to facilitate this change, researches are required to investigate the current nature of these conceptions and factors affecting these conceptions along with particular emphasis on students' learning outcomes (Martín, Pozo, Mateos, Martín, & Echeverría, 2014).

Although students academic achievement gets influenced by a variety of variables such as students' status, IQ, peer group, exposure to various learning domains and teachers' conceptions (Borich, 2014; Kauchak & Eggen, 2007), amongst which, teachers' teaching-learning conceptions are perceived to be the most contributing ones (Chan & Elliott, 2004). However a few studies have examined teachers conceptions regarding their influence to other educational variables (Boulton-Lewis, Smith, McCrindle, Burnett, & Campbell, 2001; Chan & Elliott, 2004; Engin & Daşdemir, 2015; Eren, 2009). Particularly, the literature available focusing these conceptions explored their linkage to students' academic performance.

Scholars have found conceptions as influenced by the context such as experiences as a student, learning opportunities, ones belief system, variation in personality dynamics and current practices in academic careers as a teacher (Canbay & Beceren, 2012; Chan, 2004; Richardson, 2003), therefore has attracted researchers as a an area of considerable research in the field of teaching learning contexts (e.g., Aypay, 2011; Baş, 2014; Chan, 2004; Chan & Elliott, 2004; Igwebuike, Okandeji, & Ekwevugbe, 2013; Teo & Chai, 2008).

In international scenario, teachers' instructional conceptions have been explored while investigating their impact on various dimensions such as teachers' instructional approaches, assessment practices and student learning approaches. Available literature exhibit the use of qualitative approaches to explore the phenomena of conceptions (Donche, De Maeyer, & Van Petegem, 2007; Gow & Kember, 1993) while the use of quantitative methodologies would help in completing the exploration of conceptions through validating or rectifying the findings of qualitative inquiries. Literature review revealed that there is scarcity of research work with a focus on measuring the impact of teachers' conceptions on students' achievement. To the best of author's knowledge no research work has been reported on teachers' instructional conceptions in Pakistan till date and as a result of which no theoretical / philosophical concepts are available in order to explain the effect of teachers' conceptions on students' performance. Whereas considering Pakistani education system, this research work is supposed to be useful for the exploration of the nature of conceptions held by school teachers, identifying their impact on student learning consequently exploring its significance to be included in designing / developing training courses for both pre-service and in-service teachers. While considering the research gap with regard to culture as being eastern, educational level as secondary classes and particularly the impact of teachers thinking on student's performance, it is imperative to conduct large scale quantitative studies to explore the phenomena.

Purpose of the Study

Following were the objectives of study

1. To explore teachers' conceptions of assessment at secondary level. The conceptions were explored through exploring teachers' opinions while showing their agreement or disagreement to the four purposes of assessment.
2. To measure the effect of teachers' conceptions on students' achievement at secondary level. Regression analysis using structural equation modelling will be used to identify the effect of predictor variable on criterion variable.
3. To explore the differences of effect of conceptions in the subject of English and Urdu.

Research question 1

1. Do teachers having varied subject assignment perceive assessment in the similar manner?
2. Do teachers' conceptions of assessment effect students' academic achievement in varied subjects at secondary level?

Methods

Sample of the study

The study utilized descriptive correlational survey design to explore teachers' conceptions and their effect on students' academic achievement at secondary level. A total of 600 high school teachers from four districts of Lahore division participated in the study. Sample was taken using stratified sampling technique. The teachers' responses to conceptions of assessment survey were entered in the SPSS. The missing value analysis using maximization modeling method and removing the forms completed less than 90% by the respondents was run to prepare the response sheet before analysis. Data of students' scores in the subject of English and Urdu, whose teachers participated in the study were taken from the respective schools. For each teacher, average score of their classes in their subject were used for data analysis.

Data collection and analysis procedure

Data regarding teachers' conceptions of assessment and their class results were collected after soliciting permissions from the concerned offices DPI (director public instructions) schools and DEOs (district education officers) of the sampled districts. Teachers of public high schools were requested to provide their opinions for the four conceptions of assessment through filling up the survey forms. The consent forms were attached to the survey instrument. Collected data were analyzed through descriptive, correlational and regression analytic techniques.

Instrumentation

To explore teachers' conceptions regarding assessment "Conception of Assessment Survey" (COA-III) developed by Brown et al., (2011), was used with author's prior permission. The instrument was found suitable due to its development in Asian context while focusing teachers at secondary level.

Conceptions of Assessment Abridged Survey

The scale embraced three major conceptions of assessment categorized as "improvement", "accountability" and "irrelevance". The conceptions were developed based on major purposes for which assessment events are arranged in schools. The conceptions were further divided into subscales under these major purposes. Conception of assessment improvement has three sub-factors naming a) help learning b) student development and c) accuracy while the accountability conception included two subscales named as a) examination and b) control. In order to analyze the mean values for each conception, composite mean scores adding the responses of the statements of each factor was computed.

The detail of the instrument is reproduced in the following table 1:

Table 1.

COA (Conceptions of Assessment) III Survey Item Sub-Categories

Categories	Survey Items
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Irrelevance	<ol style="list-style-type: none"> 1. Assessment results are filed and ignored 2. Assessment interferes with teaching 3. Assessment has little impact on teaching 4. Assessment is an imprecise process
Accountability(control)	<ol style="list-style-type: none"> 1. Assessment indicates how good a teacher is 2. Assessment is an accurate indicator of schools quality 3. Assessment results contributes to teachers appraisal
Accountability (examination)	<ol style="list-style-type: none"> 1. Assessment helps students to gain good scores in examinations 2. Assessment selects students for future education or employment opportunities 3. Assessment helps students avoid failures on examinations
Improvement (Student Development)	<ol style="list-style-type: none"> 1. Assessment fosters student character 2. Assessment is used to provoke students to be interested in learning 3. Assessment stimulates students think
Improvement (Accuracy)	<ol style="list-style-type: none"> 1. Assessment results are sufficiently accurate 2. Assessment results are trustworthy 3. Assessment results can be depended on
Improvement (Help Learning)	<ol style="list-style-type: none"> 1. Assessment helps students improve their learning 2. Assessment determines if students meet qualification standards 3. Assessment information modifies on going teaching of students

Structure of the Instrument

The instrument consisted of two sections:

The first part asked demographic information of the respondent (gender, age, years of experience, subject and qualification) while the second part was based on 19 items scored on a scale from 1 to 6 (1 = strongly disagree and 6 = strongly agree) mainly addressing conceptions of assessment (assessment for improvement, assessment for accountability, and assessment is irrelevant) were asked. Six point positively packed likert type response scale having four positive and two negative response categories was used. The format is considered better when a positive attitude is expected from respondents of the study (Brown, 2011).

Psychometric Properties of the Instrument

The conceptions of assessment abridged survey was in fact extracted from a 31 item large scale developed by Brown et al., (2011) for Chinese secondary school teachers. The total scale consisted of three conceptions with seven sub-factors for the conception of “improvement” and “accountability”. The third conception named “irrelevance” had no sub-factor. In order to ensure its applicability in Pakistani context, scale was validated through exploratory and confirmatory factor analytic techniques. After exploratory and confirmatory factor analysis techniques, a total of 19 items measuring three conceptions of assessment named (a) accountability, (b) improvement and (c) irrelevance were retained. The fit characteristics were found adequate in model testing. The item loadings for each factor were adequate. Therefore, factor analysis showed the items as having significantly good fit characteristics.

Table 1.

Model fitness index for Conception of Assessment

Factors	Values	Factors	Values
CMIN	495.96	Df	137
Chi-square/df	3.620	p-value	0.000
AGFI	0.921	GFI	0.943
TLI	0.915	CFI	0.932
RMSEA	0.054		

Alpha values for each sub-factor ranged between .65 to .8 showing adequate reliability of the scale.

Table 2

Mean, standard deviation of factors measuring improvement, accountability and irrelevance conceptions of assessment

Conceptions of assessment	Mean	Std. Deviation
Improvement		
a) Student Development	4.4592	.82662
b) Help Learning	4.6989	.66023
c) Accuracy	4.6951	.67556
Accountability		
a) Examinations	5.0718	.82543
b) Control	4.8663	.72932
Irrelevance	2.9160	1.45973

The values of mean and standard deviation found for the factors measuring conceptions of assessment improvement, accountability and irrelevance show teachers' strong agreement to factors representing improvement and accountability. It is evident through the values that teachers are in favor of having assessment for the improvement and accountability purposes in school. In contrast to the positive agreement found for these two conceptions, the values for the irrelevance conception of assessment shows teachers' disagreement which is obvious through the values obtained for the response categories showing disagreement of teachers. Overall strong agreement is found for accountability conception followed by improvement conception of assessment.

Descriptive Analysis of the overall conceptions of assessment

Names of the scales	Mean	Standard deviation
Assessment factor Improvement	4.61	.53
Improvement of teaching and learning		
Assessment factor Accountability	4.96	.69
Accountability of school and teacher		
Assessment factor Irrelevance	2.91	1.45
Irrelevance		

The values of mean and standard deviation obtained for the combined factors of improvement and accountability conceptions validate the above findings explored for the sub-factors of conceptions. The values obtained for three major conceptions of assessment show that teachers held positive attitude towards conceptions of assessment as “improvement” and “accountability” purposes. The mean values for these factors are above 4 (above moderately agree) which shows teachers’ higher agreement towards these conceptions. The value obtained for the conception of assessment “irrelevance” is less than 3 (slightly agree) that shows their disagreement towards conception of assessment. It is revealed that in view of teachers it is necessary that assessment should be held to bring improvement in the teaching and learning and accountability of schools and teachers.

Conception of Assessment: English

In order to measure the effect of teachers’ conceptions on students’ academic achievement, regression analysis based on structural equation modelling was used. Figure 1 shows relationship of conceptions of assessment with students’ achievement scores for the subject of English. The one side head arrows in the figure shows linear dependencies. The value mentioned on the path from each dimension on dependent variable shows the beta (estimate) impact of that dimension on dependent variable. The value of error is enclosed on the dependent variable in circle because it is not directly observed. The value mentioned on dependent variable is R², which shows the variance in the model due to all independent variables. Independent variables 1 to 3 (IV1 to 3) account for 04% of the variance of dependent variable (DV) in the proposed model.

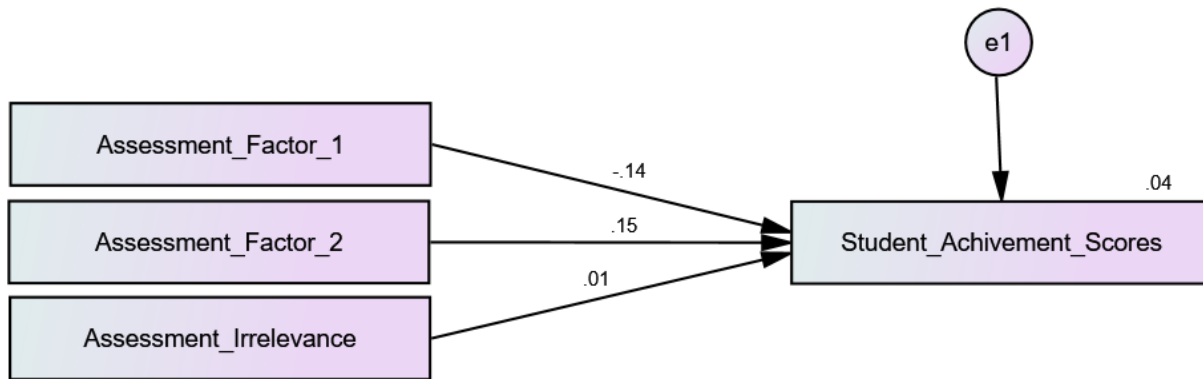


Figure 1 Model of conceptions of assessment and student achievement based on English teachers

Results of the regression analysis obtained by using maximum likelihood method in the AMOS software revealed the significant impact of teachers’ conceptions on students’ academic achievement. The result shows that assessment factor 1 “Improvement” has negative but significant effect on students’ achievement scores in the subject of English (b = - 0.138, p < 0.05), the estimate value 0.138 shows that if one unit increases in the conception of assessment “improvement” it will bring 13.8% negative impact on students’ achievement score in the subject of English. However, assessment factor 2 “Accountability” (b = 0.151, p < 0.05) shows significant impact on students’ achievement scores. The third conception of assessment “irrelevance” (b = 0.006, p > 0.05) is found to have insignificant effect on students' achievement scores. Therefore, only one variable, assessment factor 1 “accountability” is proved to have significant positive effect on students’ achievement scores in the subject of English as the p-value is < 0.05 level of significance.

Table 3

Regression Weights based on conceptions of assessment and student achievement of English teachers

			Estimate	C.R.	P
Student Achievement Scores	←	Assessment Factor 1	-.138	-2.423	.015
	←	Assessment Factor 2	.151	2.653	.008

		Estimate	C.R.	P
←	Assessment Irrelevance	.006	.108	.914

On the basis of regression weights, it is concluded that in English subject, students' achievement scores are positively influenced by assessment factor "accountability" but negatively by improvement. It is evident in the results that teachers' conception of assessment "Improvement" would decrease scores of students for the subject of English.

Conception of Assessment: Urdu

To assess the effect of teachers' conceptions of assessment on students' achievement for the subject of Urdu, regression model based on structural equation modelling in the AMOS software was proposed and is shown in figure 4.22. The results of regression model show that Independent variable 1 to 3 (IV 1 to 3) account for 03% of the variance of dependent variable (DV) in the given model.

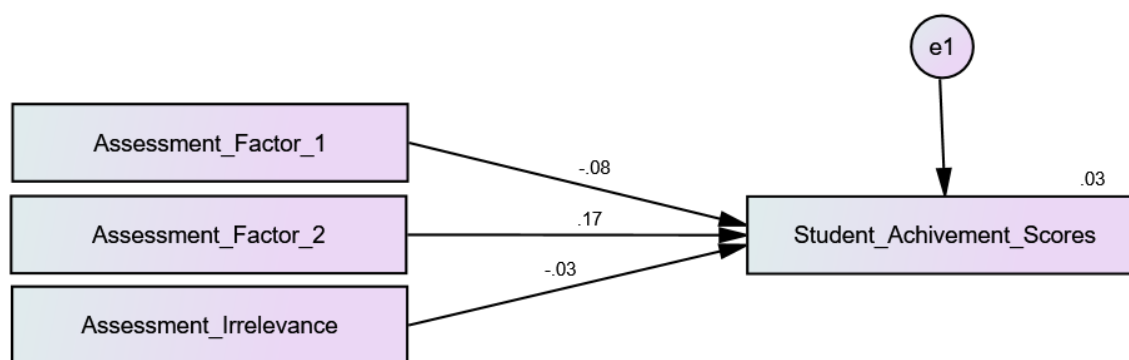


Figure 4.22 Model of conceptions of assessment and student achievement based on Urdu teachers

The result shows that assessment factor 1 has insignificant effect on students' achievement score in the subject of Urdu ($b = -0.078, p < 0.05$). The estimate value 0.078 shows that if one unit increases in the assessment factor 1 "Improvement" it will bring 7.8% negative impact on students' score in the subject of Urdu. However, assessment factor 2 "accountability" ($b = 0.167, p < 0.05$) shows significant positive impact on students' achievement scores whereas the conception of assessment "irrelevance" ($b = -0.029, p > 0.05$) shows insignificant effect on students' achievement scores. Therefore, similar results were found for both of the subjects English and Urdu where assessment factor 2 "accountability" has been found as a significant predictor of students' achievement at secondary level.

Table 4.1

Regression Weights based on conceptions of assessments and student achievement of Urdu teachers

		Estimate	C.R.	P
←	Assessment Factor 1	-.078	-1.368	.171
Student Achievement Scores ←	Assessment Factor 2	.167	2.935	.003
←	Assessment Irrelevance	-.029	-.514	.607

The results implies that teachers of Urdu and English have similar perceptions about assessment which consequently affect their students' performance. However, teachers' conceptions of assessment "Improvement" and "Irrelevance" are shown to be insignificant for their impact on students' achievement in exams. It shows that teachers enacting assessment to help students in learning or modifying teaching as a result of assessment does not affect students' performance significantly.

Results and Discussion

Results of the study are in line to the findings reported by researchers' measuring teachers' conceptions of assessment at secondary level in various regions. Brown (2002) found similar results measuring school teachers' conceptions of assessment. Study by Brown (2002) found moderate agreement of teachers towards conceptions of assessment as "improvement" and "accountability". Brown (2002) explained that teachers showed high agreement towards system accountability rather than student accountability that is similar to the findings in present study as teachers endorsed the need of accountability of teachers and schools through assessments. Following the line, similar results were reported by Brown, (2009) investigating prospective teachers' conceptions of assessment. According to his study prospective teachers were found moderately agree towards conception of assessment "improvement" and to grade students through assessments. Similar trend was observed in the study by Brown and Hirschfeld, (2008) reporting moderate agreement of teachers towards "accountability" conceptions of assessment. The results of the study are also similar to the works carried out in different regions like by Brown, Chaudhary and Dhamija (2015) in India and by Brown and Remesal (2012) in Spain.

For the "irrelevance" conception of assessment, respondents showed strong disagreement that is evident in the mean value (Mean 2.91, S.D, 1.45) obtained for the construct. This result reflects that teachers do not consider assessment as an irrelevant activity but endorse its worth and establishment for the improvement and accountability purposes at secondary level. This finding was logical and rationale as assessment is not purposeless while impedes in itself important objectives to achieve through its establishment. The result was found to be similar to those reported in previous studies. Brown and Hirschfeld, (2008), and Brown, (2009), Brown (2002), Brown (2004), Khan (2011), Brown, et al., (2015), and Brown and Remesal (2012) also reported similar level of disagreement of teachers towards irrelevance conception of assessment. This comparative analysis of the studies proved similar level of positive attitudes of teachers in different regions towards accountability and improvement conceptions of assessment. It shows stability and trend of attitude of people in a working condition.

The second objective of the present study was to identify the effect of teachers' conceptions of assessment on students' academic achievement in the subject of English and Urdu. The results revealed similar effect of teachers' conceptions for both of the subjects. The findings are not against the expectation considering the scenario of teaching and learning situation of schools at secondary level in Pakistan. Therefore, a negative trend between teachers' conception of assessment "Improvement" and student achievement is observed in the data. The finding obtained for the impact of "accountability" perception of assessment on students' achievement is also quite rationale considering the context of high stake examinations. Teachers at secondary level are forced by the school authorities to show their performance in the form of students' high scores in high stake examinations. Students' scores are also used for teachers' appraisal system. Therefore, teachers adopt techniques to prepare students for exams and grade them on the basis of classroom assessment.

Results of present study found significant impact of teachers' conceptions of assessment on students' achievement in the subject of English and Urdu. Results of the present study support the findings obtained by Brown and Hirschfeld (2008), for secondary school students' conceptions of assessment and its relationship to their achievement. Authors reported significant impact of "accountability" conception on the achievement of students. Their study explored all other conceptions of assessment being insignificant for the impact on achievement. Results of the present study are also similar in trend to those found by Walton and Brown (2009). Their study compared the impact of students' conceptions of assessment on their achievement in reading. Results of their study discovered that "accountability" conception was the most significant predictor of achievement.

The results of present study were not found to be aligned with the finding revealed by Brown (2011). The study carried out on prospective teachers found that "accountability" conception was related negatively to their achievement in the course grade. The varied results might be due to the variation on part of the sample being student teachers rather than practicing teachers. The results can be explained with reference to theory of self- regulation employing the influence of responsibility on the performance of individuals. In the Pakistani context, there is considerable pressure on teachers and schools to focus on good performance in high stake exams. Performance

shown in these high stake exams are used as indicators of schools' quality and teachers' recognition. Teachers' appraisal at secondary level also include the results shown in high stake exams. Thus, teachers' pay more attention to learning of the content leading to produce considerable performance of students. Consequently, teachers have a tendency to use strategies to enable students ready for exams. Results also confirmed that accountability perception of assessment is the most deriving force for teachers effecting students' performance in Pakistan.

Results of the present study showed conception of assessment "improvement" as negatively related to students' performance. However, Walton and Brown (2009), found insignificant impact of "improvement" conception of assessment on achievement. Similar result was reported by Brown (2011) who found conception of assessment as to improve students' learning and teaching being an insignificant predictor for the performance in exams. Another important study by Brown and Herschfeld (2008), found similar insignificant impact of "improvement" conception on students' achievement. They explored and reported negative impact of students' conceptions as "is enjoyable" and "is ignored" to their scores in reading and mathematics. The results of present study compared to the reported ones is different showing inverse relationship between "improvement" conception of assessment and students' achievement. Results are in line to the studies conducted in Pakistan such as the study by Akram (2017), reported that social, administrative and academic challenges make it difficult for the teacher to teach students giving wider exposure to learning at secondary level. He found that examination system at secondary school level does not assess a breadth of learning in a language subject. Seemingly, success in high stake exam is dependent on the perfect appreciation of the syllabus writers. Thus, teachers following the teaching for the purpose of learning rather than scoring exams would cause low performance in high stake exams.

With respect to third conception of assessment "irrelevance", results of the present study are similar to the studies reported by Walton and Brown, 2009; Brown and Herschfeld, 2009 and Brown (2011). Similar trend was explored by Brown (2011) showing "irrelevance" conception as insignificant factor impacting performance of prospective teachers. Negative relationship of "irrelevance" to achievement endorses stability of teachers' attitude of giving worth to the establishment of assessment to have more constructive outcomes.

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