



RESEARCH PAPER

**Analysis of Gap between Desired and Acquired Levels
of Knowledge-related Learning Outcomes of Ph D Graduates**

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The aim of this study was to analyse gap between desired and acquired levels of knowledge-related learning outcomes of doctoral programme in 4 public sector universities of the Punjab. The study was carried out in two phases under confirmatory mixed-methods research design. During phase-1, data were collected electronically from 269 PhD graduates on a self-developed questionnaire to assess their acquired level of knowledge-related learning outcomes. While, in phase-2 of the study, 72 faculty members were interviewed to validate the findings of phase-1. PhD graduates claimed that they had acquired learning outcomes at high level while faculty members pronounced that PhD graduates' level of acquisition was medium. Results of one sample t-test revealed significant gap between PhD graduates desired and acquired levels of knowledge-related learning outcomes. The study strongly recommended that the Higher Education Commission of Pakistan should officially include relevant sections of NQF document in the course outlines of doctoral programme.

Introduction

Learning outcomes are the written statement of what a successful student is expected to know or have the ability to demonstrate at the end of a certain educational process programme, course, qualification or a learning activity (Kennedy & McCarthy, 2016). The concept of learning outcomes has been frequently discussed in the educational literature during last two decades particularly at higher education level (Tam, 2014). Meanwhile, there has been a debate on the uses and misuses of learning outcomes. Some of the practitioners have warmly welcomed the introduction of the learning outcomes in education system while some others have seriously criticised them saying that they are being misused (Hussey & Smith, 2003).

The critique of learning outcomes opines that they are notoriously being misused as a tool for educational exploitation. Additionally, most of the time it has been merely an administrative formality for many programmes and hinders the actual assessment of students learning. On the other hand, the researchers like Adam (2004) and Lawless et al., (2007) stated that learning outcomes positively contribute in designing curriculum, organizing learning assessment and maintaining quality assurance of educational institutions. They resemble them with global positioning system (GPS) and argue that learning outcomes guide and help education process to be on the right track. Some others say that learning outcomes make students aware of the competencies and abilities they are supposed to achieve at the end of a particular programme. They also guide teachers to select relevant teaching methods and assessment techniques to make their teaching effective and plan oriented for the achievement of programme objectives (Mahajan & Singh, 2017).

In modern day education, learning outcomes are taken as the success indicators of all educational programmes. They are famous for providing clear estimation of what is expected to be acquired at the completion of an academic activity. The learning outcomes are seen as the determinant for the successful conduct and completion of a particular programme with respect to its context, relevant teaching learning activities, and the assessment technique appropriate for measuring what was learnt by the students (Nusche, 2008).

After the introduction of Bologna process in 1999 the learning outcomes are being considered as the corner stone of the educational reforms. They are popular for providing a significant methodological approach and their use as a practical device for the mobility, competitiveness, recognition and transparency in European education systems. Besides this they offer an exclusive application in education setting at three different levels i.e. local level – for the development of scheme of studies, courses and ensuing modules; at national level – for the formulation of qualifications framework and quality assurance for educational institutions; and at international level – for the recognition of higher degrees of education (NQF, 2015).

Following the Bologna process, after European countries, Pakistan like many other countries of the world developed her national qualifications framework in 2015. National qualifications framework (NQF) clearly elaborated the learning outcomes for all the eight levels of education including PhD programme by dividing them into three components (knowledge-related, skills-related and competence-related learning outcomes) (NQF, 2015).

The knowledge-related learning outcomes refer to the expected ability of a students to be acquired at the completion of an academic programme (say, PhD programme) comprising a body of facts, key principles, theories and practices related to their certain field of work (Kennedy, 2006).

Considering the importance of the learning outcomes in improving the quality and effectiveness of educational programmes, researchers have turned the

focus of their research work to them. For example, Aryanti and Adhariani (2020) analysed the perception of accounting students of Indonesia along with the employers' expectations regarding the knowledge and skills needed by the accounting students. They found an expectation gap between students' perception and that of the employers' expectations. The study by Abbasi and Bibi (2018) tried to find out skills-related gap in acquired learning outcomes between their acquired and desired level. Alshare and Sewailem (2018) found that there existed a significant gap between perceived and required level of skills-related learning outcomes of business graduates in Qatar. The study by Oczkowska and Wisniewska (2017) identified a significant gap in achievement of competence-related learning outcomes. Kamphorst et al., (2013) explored a weaker relationship between Dutch students' perceived competence and their earned credits.

In short, most of the studies on learning outcomes specifically knowledge-related learning outcomes were carried out in Western countries. Within Pakistani context, only two studies were found in the literature. Huma and Mahboob (2020) conducted a study just to compare the learning outcomes mentioned in Pakistan Qualifications Framework (2009) and National Qualifications Framework (NQF), 2015. The second study was carried out by Shah et al., (2020) who simply matched the acquired learning outcomes of Bed and MA education graduates without considering the components of NQF learning outcomes (knowledge, skills and competence).

It can be concluded from the revision of the above-mentioned research work that most of the studies pointed out significant gap between the desired and the acquired level of learning outcomes at international level. It led to the fact that there is a need to see whether or not there exist the same achievement gap of learning outcomes in Pakistan graduates. Secondly, the studies conducted in Pakistani context just compared the learning outcomes of any two programmes without referring national qualifications framework (NQF). No studies has been reported by now that have focused the acquired learning outcomes at PhD level. Additionally, National Education Policies especially policy (2009) highlighted that the education system in Pakistan is notorious for having massive gap between policy and practice. These facts warranted the need to conduct a rigorous study with the aim to assess the acquired level of learning outcomes of PhD graduates and find out gap (if any) between their desired and acquired levels.

Hence, the present study was conducted to analyse the gap between the desired and acquired level of knowledge-related learning outcomes of PhD graduates with reference national qualifications framework (NQF) of Pakistan.

Material and Methods

In this section methods and procedures are explained that were used to execute this study.

Procedure of the Study

In this study mixed methods design was used. Mixed methods design determines whether qualitative data would be collected first or quantitative data; data would be kept combine or separate for analysis (Creswell& Plano, 2012).

Mixed methods design has six types, the convergent parallel design refers to collect both quantitative and qualitative simultaneously. The explanatory sequential design includes two phases of data collection. In phase one, quantitative data are collected, in phase two qualitative data are collected to explain the quantitative results (Creswell & Plano, 2011). This design is also called confirmatory mixed methods design (Tashakkori and Teddlie 1998). The exploratory sequential design aims at exploring a phenomenon, firstly, by collecting qualitative data followed by the collection of quantitative data to describe the relationships that exist in the qualitative data.

The embedded design describes that quantitative and qualitative data are also collected concurrently. But one form of the data support other form of the data, supportive data can be quantitative or qualitative. The transformative design describes the purpose of the study, addresses value based and ideological issues like racism and ethical disability (Greene, 2007). The multiphase design explains a series of phases that are used to examine a problem by a team of researchers. It is based on convergent, explanatory, exploratory and embedded design (Creswell & Plano, 2011).

But in this research, researcher did not collect data concurrently, not explore the phenomenon, not describing the purpose of the study and not using series of phases to examine the problem by a team of researchers. For the validation of quantitative findings by qualitative analysis the confirmatory mix methods design was used. Present study aimed at assessing the knowledge -related learning outcomes of PhD graduates quantitatively and then validating through qualitative data analysis.

Population and Sample

Respondents of the study were all the enrolled PhD graduates of all the public universities of the Punjab (Pakistan). Multistage sampling technique was employed to select the sample. Multi-stage sampling technique involves two or more stages. These stages lead the researcher until to access of sample of the study (Sedgwick, 2015). Current study was consisted of three stages to select the sample. That is why multistage sampling techniques was employed to select the sample. At first stage four public sector universities that were offering doctoral programmes in three disciplines, (natural sciences, social sciences and languages) were selected purposively. At second stage, six departments two from each discipline, Chemistry

and Physics from natural sciences, Education and History from social sciences and Urdu and English from languages were taken from each selected university of Punjab Province. At third stage ten (10) PhD graduates from each department were selected conveniently (60 from each university, 240 in total from all the sampled universities however two departments history and English of Sargodha university 20 respondents were not included as these department were not offering PhD programme) and three faculty members from each department were selected conveniently (18 from each university, 72 in total from all selected universities).

Sample of the study constituted 312 respondents (240 PhD graduates and 72 faculty members) from all the selected universities.

Delimitation of the Study

Current research was delimited to PhD programmes of public sector universities of the Punjab (Pakistan).

Phases of the Study

Present study was carried out in two phases. Phase-1 was a quantitative phase while phase-2 was qualitative one.

Phase-1 of the Study: the Quantitative Phase

During phase-1 knowledge-related learning outcomes of PhD graduates were analysed quantitatively.

Instrument of Phase-1

A self-developed questionnaire with five-point likert-type rating scale was employed to collect the perception of PhD graduates of universities of Punjab, about the knowledge-related acquired learning outcomes. The scale ranged from '*strongly disagree*' to '*to strongly agree*' (i.e. 1= strongly disagree, 2 = disagree, 3 = undecided, 4 = agree, 5 = strongly agree). The tool was developed on the basis of knowledge-related learning outcomes given in the national qualifications framework. It consisted two parts. In part 'a' of the questionnaire, the demographic information of PhD graduates were asked. Whereas, part 'b' of the questionnaire was comprised of 13 items i.e., indicators of the knowledge-related learning outcomes.

Data collection procedure for Phase-1

Due to the prevailing COVID-19 pandemic situation the universities were closed. Hence, it was not feasible for the researcher to collect the data physically from selected universities. So, the questionnaire was converted into Google forms. After that researcher visited the selected universities and sought the permission of head of departments (HODs') and got the contact numbers of class representatives (CRs') of the selected programmes. With the help of CRs' the research tool was

circulated in their WhatsApp groups for data collection. In this way, 269 filled-in questionnaires were received from PhD graduates with the following break up: 81 questionnaires from University of the Punjab (Chemistry=18, Physics =12, Education =20, History=10, Urdu=10 and English=11), 76 from Bahauddin Zakariya University (Chemistry=21, Physics=10, Education=10, History=12, Urdu=12 of and English=11), 62 from Government College University Faisalabad (Chemistry=10, Physics=10, Education=12, History=10, Urdu=10 and English=10) and 50 PhD graduates from Sargodha university (Chemistry=10, Physics=12, Education=16, none from History, Urdu=12 and none from English).

Results and Discussion

Phase-1

This section describes the quantitative results of the study.

Table 1
PhD Graduates' acquired Level of Knowledge-related Learning Outcomes

Statements	SA	A	SA+A	UN	DA	SDA	SDA+ DA	Mean	Level
Doctoral degree gives knowledge of:									
1. up-to-date awareness	28.0	58.8	86.8	4.7	4.3	4.3	8.6	4.02	High
2. research principles	18.3	67.7	86.0	6.2	3.9	3.9	7.8	3.93	High
3. research principles applicable in learning	17.1	62.3	79.4	10.9	5.8	3.9	9.7	3.83	High
4. research methods	21.8	61.1	82.9	7.8	5.8	3.5	9.3	3.92	High
5. research methods implementation	17.5	59.1	76.6	11.7	8.2	3.5	11.7	3.79	High
6. research of new competence	23.7	61.9	85.6	6.2	5.4	2.7	8.1	3.98	High
7. Interdisciplinary studies	16.3	55.3	71.6	15.2	8.9	4.3	13.2	3.70	High
8. Analysis of new ideas	26.8	59.1	85.9	5.1	6.2	2.7	8.9	4.01	High
9. Analysis of complex ideas	18.7	55.6	73.7	10.1	12.1	3.5	15.6	3.74	High
10. Synthesis of new ideas	23.0	56.0	79.0	9.7	7.4	3.9	11.3	3.87	High

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11. Assessment of new ideas	19.8	62.3	82.1	8.9	5.4	3.5	8.9	3.89	High
12. Assessment of complex ideas	19.1	51.0	70.1	13.2	13.6	3.1	16.7	3.69	High
13. New contribution in research	13.9	51.0	82.9	7.8	5.4	3.9	9.3	4.02	High
Overall % of (knowledge)	20.3	58.6	80.2	9.03	7.1	3.6	10.7	3.88	High

Table 1 shows PhD graduates' acquired level of knowledge-related learning outcomes. The data in the table indicate that the PhD graduates attained high level of knowledge-related acquired learning outcomes in 'up-to-date awareness', 'research principles', 'research methods', and their 'application in learning' and in the 'field of research', 'search new competence', 'new contribution', 'interdisciplinary studies', 'analysis', 'synthesis and assessment of new as well complex ideas'.

Over all, it was revealed that doctoral degree gave the high level knowledge to the PhD graduates.

Table 2
Gap between Desired and Acquired Level of Knowledge

Learning Outcomes	Level	M	Gap	SD	t	P
1. up-to-date awareness	Acquired	4.02	-9.8	.941	-16.79	.000
	Desired	5.00				
2. research principles	Acquired	3.93	-1.07	.865	-19.90	.000
	Desired	5.00				
3. research principles	acquired	3.83	-1.17	.915	-20.51	.000
	Desired	5.00				
4. research methods	Acquired	3.92	-1.08	.917	-18.91	.000
	Desired	5.00				
5. research methods which are applicable to learning	Acquired	3.79	-1.21	.945	-20.53	.000
	Desired	5.00				
6. research of new knowledge	Acquired	3.98	-1.02	.875	-18.61	.000
	Desired	5.00				
7. interdisciplinary studies	Acquired	3.70	-1.30	.987	-21.04	.000
	Desired	5.00				
8. analysis of new ideas	Acquired	4.01	-0.99	.903	-17.54	.000
	Desired	5.00				
9. analysis of complex ideas	Acquired	3.74	-1.26	1.011	-20.00	.000
	Desired	5.00				
10. synthesis of new ideas	Acquired	3.87	-1.13	.979	-18.54	.000
	Desired	5.00				
11. assessment of new	Acquired	3.89	-1.11	.902	-19.65	.000

ideas	Desired	5.00				
12. assessment of complex ideas	Acquired	3.69	-1.31	1.028	-20.38	.000
	Desired	5.00				
13. new contribution in the field of research	Acquired	4.02	-0.98	.984	-16.04	.000
	Desired	5.00				

Table 2 indicates that one-sample t-test was applied to identify the gap between desired and Acquired level of knowledge-related learning outcomes of PhD graduates. Data in the table indicate that there exists a significant gap between Acquired and desired level of knowledge-related learning outcomes gained by PhD graduates. It means that the Acquired level of knowledge-related learning outcomes of PhD graduates is lesser than that of the desired level.

Table3
Correlation between Perceived and actual Achievement of Learning Outcomes

Variable	Achievement	
Knowledge	R	0.08
	p-value	0.227

$P < 0.05$

The table 3 describes that the Pearson correlation was calculated to find the relationship between the perceived achievement level of knowledge-related learning outcomes and the actual achievement (CGPA) of PhD graduates. The results indicate that there was no significant relationship between the actual achievement of PhD graduates and their perceived level of knowledge-related acquired learning outcomes.

Knowledge-related Acquired Learning Outcomes

It was found that PhD graduates attained high level of knowledge-related learning outcomes. In the same way, PhD graduates acquired high level of knowledge in its all indicators including 'up-to-date awareness', 'research principles', 'research methods and their application in learning and in the field of research', 'search new competence', 'new contribution', 'interdisciplinary studies', 'analysis', 'synthesis and assessment of new as well complex ideas'.

Achievement Gap of Knowledge-related Learning Outcomes

It was found that the acquired level of knowledge-related learning outcomes of PhD graduates is lesser than that of their desired level.

Relationship between reported learning outcomes and actual Acquired Learning outcomes (CGPA)

The finding of the quantitative data revealed that there is no significant relationship between reported level of learning outcomes and actual acquired learning outcomes (CGPA) (table.3.). During their interview, the faculty members

also confirmed that commonly there is no relationship between what graduates perceive about their achievement level of learning outcomes and what they actually attain (CGPA). The faculty members added that this might be due to the notorious drawback of self-assessment where the assessors generally over rate themselves.

Phase-2 of the Study: the Qualitative Phase

In this phase findings of phase-1 regarding PhD graduates' perceived achievement level of knowledge-related outcomes were validated through the perceptions of faculty members.

Instrument of the Study

A semi-structured interview schedule was developed on the basis of findings of the quantitative data. This instrument was consisted of 4 questions. Three of them were addressing a finding of phase-1 while through question no. 4 the faculty members were asked to suggest certain measures to minimize the gap between desired and acquired level of knowledge-related learning outcomes.

To confirm the findings of phase-1, faculty members were interviewed. Majority of faculty members clearly disagreed with the claim that PhD graduates attained high level of knowledge. Rather, they proclaimed that the achievement level of knowledge of PhD graduates was medium.

Moreover, faculty members pointed out the underlying reasons of graduates not achieving high level of knowledge, and suggested certain measures to bridge the achievements gap.

Following table indicates the responses of PhD graduates and faculty members about achievement level of knowledge, its underlying reasons, and the suggestions of faculty members to bridge this gap.

**Table 5
Achievement Gap of Knowledge, its Reasons and the Suggested Measures**

Sub-theme	PhD graduates response	Faculty members Response	Underlining reasons by faculty members	Suggestions by teachers to achieve maximum level of learning outcomes	<i>f</i>
Acquired level of Knowledge	PhD graduates claim that doctoral degree gave them <i>high</i> level of knowledge	University faculty members claim that doctoral degree imparted the graduates	PhD graduates could not achieve high level of knowledge due to: existing curriculum which unable to fulfil	Curriculum revision is required according to the present day needs of the learners	(N=27, 37%)

<i>Medium</i> level of knowledge	the demands of present day world		
	ineffective evaluation process in the universities	effective evaluation process is required in universities	(N=14, 19%)
	lack of interest of learners in their learning	Self -motivation by rewards etc.	(N =34 47%)
	students do not learn independently	Book reading, review articles, audio video lectures , library routine are necessary for enhancement of students' knowledge	(N=43. 59%)
	limited prior knowledge	Students should not be bound to selective reading for the sake of just passing exams, securing high grades/degree	(N=40. 55%)
	teachers /students communication gaps	Teacher should avoid using English language during lecture while communicating with students	(N=40. 55%)
	lack of proper guidance and motivations by teachers regarding how the students can enhance knowledge	Teacher should work as a guide, a motivator and a facilitator for students and encourage them to work independently	(N=25. 34%)
	lack of parents-teacher contact to know the needs of students	parent teachers meeting should be frequently conducted to discuss students'	(N=25. 34%)

	progress	
lack of teachers' up-to-date knowledge	HEC should invest its resources in academic development of teachers	(N=17 24%)
Infrequent teacher-student interaction about academic progress of students	Regular interaction between teachers and students on academic progress may be ensured through online	(N=17 24%)
Out-dated course outlines	Course outlines should be revised according to the global standards and the needs of market	(N=51. 70%)

Table 5 shows the perception of PhD graduates about their knowledge-related acquired level of learning outcomes, the responses of faculty members, reasons of contradiction between perception of PhD graduates and faculty members and suggestions given by faculty members to achieve high level of learning outcomes. The data given in the table show that PhD graduates claim that doctoral degree gave them *high* level of knowledge but university faculty members negated the students' point of view and said that doctoral degree imparted in the graduates' *Medium* level of knowledge due to different reasons. The faculty members fortified their standpoint by highlighting the reasons like 'existing curriculum which is unable to fulfil the demands of present day world', 'ineffective evaluation process in the universities', 'lack of interest of learners in their learning', 'students do not learn independently', 'limited prior knowledge', 'teachers /students communication gaps', 'lack of proper guidance and motivations by teachers regarding how the students can enhance knowledge', 'lack of parents-teacher contact to know the needs of students', 'lack of teachers' up-to-date knowledge', 'infrequent teacher-student interaction about academic progress of students', 'Out-dated course outlines'.

Moreover the faculty members also suggested certain measures to achieve high level of knowledge, for example, 'curriculum revision is required according to the present day needs of the learners', 'effective evaluation process is required in universities', 'self -motivation by rewards etc., book reading, review articles, audio video lectures', 'library routine are necessary for enhancement of students' knowledge, 'students should not be bound to selective reading for the sake of just passing exams', 'securing high grades/degree', 'teachers should avoid using

English language during lecture while communicating with students', 'teacher should work as a guide', 'a motivator and a facilitator for students and encourage them to work independently', 'parent teachers meeting should be frequently conducted to discuss students 'progress', 'HEC should invest its resources in academic development of teachers', 'regular interaction between teachers and students on academic progress may be ensured through online and course outlines should be revised according to the global standards and the needs of market'.

Findings of Qualitative Data: Phase-2

Knowledge-related Acquired Learning Outcomes: Faculty Members' Perspective

Faculty members did not support the claim of PhD graduates regarding high level of knowledge-related acquired learning outcomes at the end of their PhD degree due to some underlying reasons. These reasons include 'existing curriculum which is unable to fulfil the demands of present day world', 'ineffective evaluation process in the universities', 'lack of interest of learners in their learning', 'students do not learn independently', 'limited prior knowledge', 'teachers /students communication gaps', 'lack of proper guidance and motivations by teachers regarding how the students can enhance knowledge', 'lack of parents-teacher contact to know the needs of students', 'lack of teachers' up-to-date knowledge', 'infrequent teacher-student interaction about academic progress of students', 'Out-dated course outlines'.

Discussion

Outcome based education is emerging trend in higher education. The education which is measure through its outcomes is outcome-based education. Internationally, the first serious attempt towards progress of outcome-based education was taken in 1999 when development of Bologna Process was started. The emergence of Bologna Process (1999-2010) has caused a complete paradigm shift from traditional teacher-centred approach to the outcome-based learning. By 2015, almost 100 countries of the world adopted the Bologna Process to revamp their higher education on the basis of internationally agreed upon standards. Similarly, during last two decades Pakistan is striving to enhance the quality of teaching and learning at all levels of education. Particularly after the establishment of Higher Education Commission of Pakistan, its special point of concern is quality of higher education. For the enhancement of quality of higher education HEC is taking different steps continuously and gradually. Amongst them development of national qualifications framework (NQF) is more significant step. Higher Education Commission of Pakistan (HEC) started developing its National Qualifications Framework (NQF) in 2009 which was launched in 2015. The objectives of National Qualifications Framework emphasize on the assessment of required qualification of learners and to prepare a candidate for the national and international standards of qualifications. The National Qualifications Framework stresses upon the process of smart but comprehensive learning. For this smart but comprehensive process of

learning, it introduced learning outcomes i.e., knowledge, skills and competence for all levels of education including 8th level-higher education.

Present study was carried out to analyse the knowledge-related acquired learning outcomes of doctoral programme. Findings of the study revealed that PhD graduates perceived that doctoral degree gave them high level of knowledge-related learning outcomes.

These findings are based on self-assessment of PhD graduates regarding acquired learning outcomes on a five-point Likert type scale. The high level of PhD graduates acquired learning outcomes might be the due to the reason that self-assessment rating scales are notorious for their disadvantage that respondents commonly over-rate their achievements (Karnilowicz, 2012). However, some of the studies have been reported upon showing the high satisfaction and/or achievement level in certain educational programmes. For example, the findings of the work by Gupta et al., (2007) supported this standpoint. Findings drawn from the comparison of PhD graduates' acquired and the desired level of knowledge-related learning outcomes showed that the acquired level of knowledge-related learning outcomes of PhD graduates was lesser than that of the desired level. The achievement gap of learning outcomes in terms of knowledge is threatening to the overall performance of an organization. This achievement gap is referred to the inadequacy of knowledge among to meet the desires of work place (McGuinness & Ortiz 2016). The American Society for Training and Development (ASTD) defines knowledge, skills and competence gaps as the gaps between an institution's existing proficiencies and the competences it desires to attain its objectives (Singh & Sharma, 2014). Knowledge gaps have the potential to damage an organization's efficiency level (McGuinness & Ortiz, 2016). The literature on learning outcomes shows that the knowledge gaps incline to classify by three main reasons. Firstly, it brings inadequacies in the educational system that fails to train new graduates with basic knowledge, skills and competence (Hobson et al., 2014). Secondly, under the influence of these gaps the organization lags behind the speedy change in technology (Chen et al., 2015). Thirdly, they cause a sharp decrease in training opportunities in an organization that would have assisted new learners to increase their knowledge, skills and competence (Oslon, 2015). Findings of present study are validated by the findings of Aryanti and Adhariani (2020). The research work was focused at analysing the perceptions of accounting students and the expectations of employers regarding the skills and knowledge needed by accounting graduates in Indonesia. The study concluded that there exists an expectation gap between the perception of students and the expectations of employers towards knowledge and skills necessary for accounting graduates. The reported high level of acquired learning outcomes of PhD graduates was validated by seeing the relationship between their perceived level of acquired learning outcomes and their actual achievement (earned CGPA). It was found that there is no significant relationship between the actual achievement of PhD graduates and their acquired level of learning outcomes. It is unavoidable to note that the research work reported in the literature presents a contrasting picture of the situation. The studies claim weak to moderate relationship between graduates'

perceived and actual achievement. This sharp contrast in the findings might be underpinned by certain reasons. Firstly, this might be due to contextual difference i.e., both of these studies have been conducted outside Pakistan specifically in developed European countries who have adopted Bologna process decades ago and formulated and implemented their national qualifications frameworks (NQF) in the beginning of 21st century. By doing so they transformed their education systems from traditional teacher-centred to modern outcome-based systems. While Pakistan has introduced her national qualifications framework in 2015 and still trying for proper implementation. Secondly, the studies with contrasting results have been conducted on graduate level whereas the present study was carried out among PhD graduates. Thirdly, this might be due the prevailing biasness in the Pakistani institutions as found by Pervaiz (2020) who analysed the semester examination system in public sector universities of Pakistan. Fourthly, the absence of any relationship between their perceived and actual achievement seemingly leads to the fact that the PhD graduates have rated themselves haphazardly as has always been the threat of over-rating by the respondents in the case of self-assessment.

Conclusions

PhD graduates perceived that they have had high level of knowledge-related acquired learning outcomes of doctoral program yet this achievement was lesser than that of the desired level. On the other hand, faculty members proclaimed that PhD graduates had acquired medium level of knowledge-related learning outcomes. Moreover, no relationship was found between PhD graduates' perceived level of knowledge and their actual achievement (CGPA). Hence, it was concluded that PhD graduates' did not achieve high level of knowledge-related outcomes of doctoral programme.

Faculty members suggested various measures to achieve high level of knowledge-related learning outcomes. For example: curriculum revision is required according to the present day needs of the learners; effective evaluation process is required in universities; self -motivation by rewards etc.; book reading, review articles, audio video lectures, regular library visits are necessary for enhancement of students' knowledge; students should not be bound to selective reading for the sake of just passing examination or securing high grades/degree; teacher should avoid using English language during lecture while communicating with students, teacher should work as a guide, a motivator and a facilitator for students and encourage them to work independently, parent teachers meeting should be frequently conducted to discuss students' progress, HEC should invest its resources in academic development of teachers, regular interaction between teachers and students on academic progress may be ensured through online and course outlines should be revised according to the global standards and the needs of market.

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