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Exploring the Obstacles and Gaps in Performance of Teachers by Using Behavior Engineering Model (BEM)

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Abstract
In Pakistan specially in the Province of the Punjab the performance of public sector teachers has been facing intensive criticism. Some critics of teachers point out that gap in performance is the function of the individual characteristics of teachers but some others argues that gap in performance is because of the environmental factors. This study was conducted to explore the gaps in performance of teachers and obstacles in the ways of integrating technology by using of Gilbert's behavioral engineering model (BEM). The research design was the developmental research method of type 1. Chevalier's updated version of developmental research of type 1 was implemented to achieve the objectives of this study. This method of research was consisted of two phases. In phase 1, a cause analysis survey was conducted to find the usability of BEM. The survey was administrated to randomly selected 150 out of 3723 high school teachers and 100 out of 176 head teachers of public sector schools in District Toba Tek Singh. In the second phase of the study the implementation of BEM was validated by two experts. The cause analysis of the data thus obtained showed that lack of incentives and motives working of teachers were the barrier to integration of educational technology into teaching practices and that the school administration did not focus on the use of technology in the classrooms. The expert reviewers validated the implementation of BEM and identification of obstacles to performance and performance gaps. They also supported the use BEM of Thomas F. Gilbert in Government schools of District Toba Tek Singh.
Keywords: Behavior Engineering Model, Worthy performance, integration of technology in teaching, environmental factors, personal repertory

1. Introduction

In Pakistan specially in the Province of the Punjab the performance of public sector teachers has been facing intensive criticism (Saeed, 2013). Some critics of teachers point out that gap in performance is the function of the individual characteristics of teachers but some others argues that gap in performance is because of the environmental factors (Ahmad et al., 2014). The research on role of education and its standards in the past proclaims that the human capital development is crucial for economic and social development of a state. The human capital of a country is the sum of knowledge, skill and attitude of the individuals of the country (Ahmad et al., 2014). This human capital development is accomplished by the system of education. The most influential component of the education system is teacher working in it (UNESCO, 2006).

According to UNESCO (2006) report the professional development standards of teachers in Pakistan are not satisfactory. Thus, the researcher believes that the identification of the obstacles in ways of performance of teachers and fixation the gaps in performance of the teachers needs to be addressed by empirical investigation. This study was designed to identify the obstacles in way integrating technology in teacher's performance and gaps in the performance. The use of educational technology in teaching is supported by the studies of (Eduventures, 2009; Yılmaz et al., 2021; Hosseini et al., 2017) as it effects the level of motivation of a teacher (Ahmad, 2014). McLaughlin (2015) suggested to the coaching managers to use of behavior engineering model of Thomas F. Gilbert to improve the performance. There is a range of employee's perceptions about motivation. Some employees are motivated by friendly environment of the organization and some others are motivated by material incentives to perform their best and make use of their maximum potential (Nyaude, 2008). The research study of Slade (2008) has supported the development of personal repertory of teachers to enhance their performance and this is what Gilbert (1978) has presented in his behavior engineering model. According to BEM worthy behavior or performance is proportional to the product of environmental factors and personal repertory. It is represented as B=E×P whereas B=behavior, E=environmental factors and P=personal repertory.

According to updated model of Chevalier (2003) there are two forces that influence the performance of an individual workers namely driving forces and restraining forces. The driving forces include incentives, motives and information. The restraining forces include capacity, resources and knowledge. The impact of these factors and how to manage these factors is presented graphically in the figure below. It shows the magnitude of each factors and cost of them to manipulate these factors. It shows that knowledge is the least effective and the costliest to manipulate it whereas the information, incentive, resources and motive are more effective in less cost.

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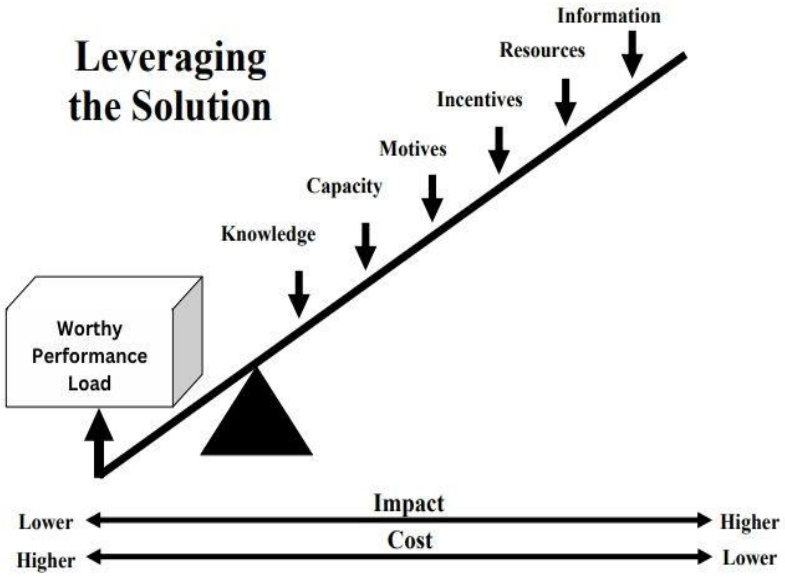

Figure 1: Leverage Impact of the Factors in BEM: Adopted from Figure 4 of Updating the Behavior Engineering Model by Chevalier (2003)

Knezek (2009) supported the synchrony of resources, motivational forces and incentives to execute the BEM and emphasized on giving clear dreams to the workers and supporting devices in the form of financial and non-financial backings. With the supporting devices, the educational technology the most valuable (Balanaskat, et al. 2006). But unfortunately, the use of technology in the classroom is so difficult that the small segment of teachers about 22%, even developed countries like USA, deliver their instruction infrequently by integrating technology into the usual instructional plan (Busteed, 2012).

The studies of Charles (2013), Chevalier (2003) and Borkovskaya & Passmore (2019) showed that the BEM of Thomas Gilbert is suitable to find the gap in the performance of an individual worker.

The research work has focused on the performance of coaching managers (McLaughlin, 2015) and employee perceptions about motivation (Nyaude, 2008) and impact of in-service optional e-training on the workforce provided by the employer. Another group of studies like (Alnasraween & Shahadab, 2022; Jacobson & Cole, 2020) has focused on obstacles to distance e-learning and motivations and obstacles to adaptation of innovations in teaching. All these studies are addressing the teaching in western context. In Pakistan, especially in the province of the Punjab the teaching and education system are culturally different. There are a number of factors for instance religious beliefs, financial constraints, political will, unemployment and moral issues which makes this education system quite different from rest of the contemporary education systems (Hamid & Nadeem, 2020). This state of matter of the performance of teachers in the Punjab convinced the researcher to find out the gaps in performance and the obstacles to integrate the educational technology and instructional plan of the teachers by applying the BEM of Thomas F. Gilbert. This study is significant for Policy makers in the governmental bodies of Pakistan as this study provides research-based information about the need of teacher's performance, obstacles in the way of performance of teachers, and ways how to manipulate the behavior of teachers and administrators of the educational institutions as this study provides information about the environmental factors and individual repertory of the teachers that help manage teacher's performance and the teachers of public high schools as this study provides a comprehensive knowledge about role and responsivities of the teachers to rectify their teaching practices. It identifies the barriers to performance so that they mind what are Do's and Don'ts.

1.1. Objectives of the Study

The objectives of the study are:

1. To identify the obstacles in performance of teachers by applying Gilbert's Behavioral Engineering Model.
2. To assess the usability of Gilbert's Behavioral Engineering Model for improving performance of teachers.

1.2. Significance of the Study

The findings of this study rebounded to the benefits of the Pakistani society considering that performance of teacher plays an important role in national prosperity. The greatest demand for effective and reflective teachers justifies the need for an explicit description of obstacles in the way of teacher's performance and need of an explicit strategy of manipulation of teacher's behavior. This study provides an in-depth insight into the phenomenon of performance of

the teachers. The results of the study provide an explicit description of the gaps and obstacles in the way of effective teaching in the light of Gilbert's Behavior Engineering Model. Thus, followings groups of individuals are likely to be benefitted from this study:

- Policy makers in the governmental bodies of Pakistan as this study provides research-based information about the need of teacher's performance, obstacles in the way of performance of teachers, and ways how to manipulate the behavior of teachers.
- Administrators of the educational institutions as this study provides information about the environmental factors and individual repertory of the teachers that help manage teacher's performance.
- The teachers of public high schools as this study provides a comprehensive knowledge about role and responsivities of the teachers to rectify their teaching practices. It identifies the barriers to performance so that they mind what are Do's and Don'ts.

1.3. Delimitations of the Study

This study was delimited to:

1. the teachers of district Toba Tek Singh in the province of the Punjab
2. the teachers of high school in the district TTS

2. Methodology

The design of this study was developmental research method to identify the gaps in the performance of teachers and barriers in integration of technology in high schools of District Toba Tek Singh in the light of BEM. This research design is used for systematic study of an instructional program to develop empirical basis for an instructional strategy. It has two types. The type 1 of this research method focuses on instructional plan and development of general principles to up-grate the instructional program. (Richey & Klein, 2005) The updated model of Chevalier (2003) was used for this purpose. The study was consisted of two phases. In the first phase the data were collected by tailor made survey questionnaire from randomly selected 150 teachers and 100 headteachers. The target population was composed of 3723 teachers and 176 headteachers of the district TTS. The data was collected by a questionnaire formulated on 4-point Likert scale. The items in the questionnaire addressed the six parameters namely as suggested by Chevalier (2003) information, resources, incentives, knowledge/skills, capacity and motives. The point values allocated for item 1 were extremely well=1, very well=2, rarely=3, not at all=4 and for item 20 were always=4, sometimes=3, rarely=2 and not at all=1. For item 2 through 24 the allocated point values were always=1, sometimes=2, rarely=3 and not at all=4. The validity of the questionnaire was established by opinion of expert reviewers. The reliability was established by pilot testing and computing the Cronbach's alpha value which was found to be 0.86. The data was analyzed by applying descriptive statistics. The frequencies and weighted mean were determined to find the trends of opinions of the participants.

In the second phase of the study two expert reviewers were selected on the basis of their experience in human performance technologies (HPT). A questionnaire consisting of ten items was provided to the reviewers. The scheme of implementation of BEM and the finding were also provided to the reviewers.

3. The Results of the Phase One of the Study

The cause analysis survey administered for the purpose of this study includes six parameters of Gilbert's behavior engineering model namely information, resources, incentives, knowledge, capacity and motives. The results of data analysis of each of these factors are presented in tables 1 to 6. In these tables only item wise mean and overall mean of the group of the items is presented and the frequency distribution is omitted for sake of brevity. First three tables show the data analysis of three environmental factors and the last three tables show the data analysis of personal repertory factors.

The tables 1 to 3 show the pattern of trend of opinion of the participants about information, resources and incentives respectively. The mean score of the responses against the factor 1 information is 2.22 which is less than 2.5. It shows that the trend of opinion is not favorable. It means lack of information is not a barrier to technology incorporation into teaching plan of teachers. Similarly, the calculated mean of the responses against the factor 2 resources is 1.95. It shows the resources are not a hinderance in the way of implementation of technology in teaching. The mean score for the factor incentives is 2.68 which shows that more than 50% responses of the participants fall in 3- or 4-point value. It indicates that the incentives are a barrier in way of integration of technology in teaching.

Table 1: Cause Analysis of Information-Environmental Factor

S.No.	Items	Item wise mean	Mean
1	Have you been informed of all school tools and technical requirements to teachers?	2.13	
2	Are you aware of your role in using technology as an instructional tool?	2.1	
3	Does the system of evaluation help your primary evaluator in explaining expectations for the technology use?	2.24	2.22
4	Do you get relevant feedback about the technological use in your classroom?	2.53	
20	Were you communicated about that you are expected to combine technologies with usual instructional plan?	2.1	

Table 2: Cause Analysis of Resources-Environmental Factor

S. No.	Items description	Item wise mean	Mean
5	Before your recruitment, did the management inform you that teacher is expected to know the use of technology into their instructional process?	1.98	
6	Are the approaches and techniques for the usage of technology described in this sort of manner that it enhances your capability to educate?	1.94	
7	Are you supplied with get right of entry to the community, computer systems, and software program essential to implement area for your lecture room?	1.97	1.95
8	Do you have enough time to learn about the techniques used for administrative and academic purposes?	1.89	

Table 3: Cause Analysis of Incentives-Environmental Factor

S.No	Item description	Item wise Mean	Mean
10	Are there sufficient financial incentives present to inspire using generation?	2.7	
11	Are there enough non-monetary incentives gift to encourage using generation?	2.78	
12	Do measurements and reporting structures tune the use of generation?	2.64	
13	Are there career opportunities related to teaching job?	2.61	2.68

The tables 4 to 6 show the trend of opinion of the participants about the factors belonging to the category of personal repertory. These factors include knowledge, capacity and motives.

Table 4: Cause Analysis of Knowledge-Personal Repertory Factor

S. No	Item description	Item wise Mean	Mean
22	Your ability to integrate educational technology into your usual instructional plan impact positively on achievement.	1.92	
23	You have sufficient knowledge to incorporate technology in classroom	1.89	
24	Are you worried in systematic training software to beautify your know-how and capabilities of era?	1.94	1.92
	You have gotten systematic training to incorporate technology in teaching.		

Table 5: Cause Analysis of Capacity-Personal Repertory Factor

S. No	Items description	Item wise mean	Mean
17	You are willing to incorporate technology in classroom teaching.	1.93	
18	You felt anxiety to incorporate technology in the classroom	1.72	
19	You have efficacy to meet the expectations to incorporate technology in the classroom teaching.	1.72	1.71
21	You face physical hinderance in integrating technology in teaching.	1.68	

Table 6: Cause Analysis of Motives-Personal Repertory Factor

S.No	Items description	Item wise Mean	Mean
9	The environment is favorable for integration of technology in teaching.	2.51	
14	The work environment positive to use technology in teaching.	2.81	
15	The minimal use of technology in teaching is reinforced by some rewards	2.70	
16	There are some negative impacts of using technology in the classroom for teaching.	2.90	2.73

The tables 4 to 6 show the trend of opinion of the participants about knowledge, capacity and motives respectively. The mean score of the responses against the factor 4 knowledge is 1.92 which is less than 2.5. It shows that the trend of opinion is not favorable. It means lack of knowledge is not a barrier to technology incorporation into teaching plan of teachers. Similarly, the calculated mean of the responses against the factor 4 capacity is 1.71. It shows the factor capacity is not a hinderance in the way of implementation of technology in teaching. The mean score for the factor motives is 2.76 which shows that more than 50% responses of the participants fall in 3- or 4-point value. It indicates that the motives are a barrier in way of integration of technology in teaching.

4. The Results of The Phase Two of The Study

Table 7: The Analysis of The Responses of Expert Reviewers

S.No	Questions	Response Expert of Reviewer 1	Response of Expert Reviewer 1
1	Is the BEM useful in filling up the performance gaps?	No	No
2	Is the BEM accurate to determine obstacles in technology incorporation in teaching?	Yes	Yes
3	Is the BEM has others benefits?	No	No
4	Are you feeling some limitations to implement BEM?	Yes	Yes
5	Is the information got from BEM useful?	Yes	Yes
6	Are there some obstacles to use BEM?	Yes	Yes
7	Is the BEM valid to achieve its objectives?	Yes	Yes
8	Is it difficult to use BEM?	No	Yes
9	Does the BEM find the reasons for the performance gaps?	No	Yes
10	Is the BEM suitable to determine obstacles in public education	Yes	Yes

Table 7 shows the trend of opinion of the expert reviewers about the usability of Behavior Engineering Model. The reviewer 1 gave response yes to 6 questions no to 4 questions. So, the overall behavior is in the favor of usability of BEM to identify obstacles in technology integration. Similarly, the reviewer 2 gave response yes to 8 questions and no to 2 questions only. Thus, it was concluded that he is also in favor of usability of BEM.

5. Discussion and Conclusions

The findings of the study are in line with the studies of (Charles, 2013; Slade, 2008; Nyaude, 2008; Eduventures, 2009). However, this study found that incentives and motives both are a barrier to integrate technology with teaching in opposite to the findings of Charles (2013) where he found only financial and non-financial incentives are barrier to technology integration. This can be explained by the arguments that this study is in Pakistani context where there is lack incentive-based motivation (Lee & Kulviwat, 2008; OECD, 2009). And research studies on this issue advocate that incentives and motives are linked with each other (Cerasoli et al., 2014; Lee & Kulviwat, 2008). In the light of the findings of data analysis of phase 1 of the study it was concluded that the gaps in performance do exist in both environmental factors and individual factors. The study concludes that the lack of incentives among the environmental factors and the lack of motivation among the individual repertory factors are barrier in the way incorporating technology in classroom teaching. And from the findings of second phase of the study it was concluded that the Behavior Engineering Model is useful to explore the gaps in performance and to identify the obstacles in the way of integration of technology in teaching. However, the expert reviewers suggested that the study should be enriched by collecting more diverse and large data from teachers and administrations. They also suggested that it might be better implement BEM in native language.

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