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Dilemma or changeover: Drawing on departure to outcome-based education in Afghanistan

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Abstract

In this study, we hypothesize the significant difference between the traditional and Outcome-based Education (OBE) curriculum development and implementation in Afghanistan. For this purpose, we retrieve a set of data covering the total percentage of graduated students in 2017 as an outcome of traditional curriculum and the total percentage of graduated students in 2019 as an outcome of OBE curriculum from the central curriculum committee and professional development center's database of Kabul University. Applying the independent two sample t-test with unequal variance method, we find that the corresponding p-value for t-test being 0.000 < 0.01 is statistically significant to reject the null hypothesis. We conclude that there is a significant difference between OBE and traditional curriculum output expressed in terms of graduate's employability in the local Market. Thus, our statistical findings evidence the favor for OBE over the traditional curriculum implementation as a coefficient of employability in Afghanistan.

Keywords: OBE, Traditional, Afghanistan, t-test, unequal variance, Kabul University.

Introduction

Effective teaching is always open to incorporate constant efforts in analyzing the impact of instruction on teaching and learning, and adjust the instructions in the light of anticipated outcome and learners' competencies. The recent developments in higher education mode show a significant progress made with the move to outcome-based education (OBE)[1], which was an important trend in provoking the knowledge-based economy and to enabling both the instructors and students to focus on the delivery of an educational system.

The OBE adoption has brought about significant changes in the way of relaying over the instructor rather it focuses on the ability of learners as an exit strategy[2]. Although, departing to OBE approach imposes great challenges to instructors and educators[3] in past several years, it gained momentum in the higher education sector across the globe. Traditionally, the lesson-based model has been one of the effectives methods in disseminating as much information as quickly as possible[4] but had several drawbacks in making the poor students to play passive roles and poor lecturers in wasting the class time by engaging the students in taking notes, memorizing and repeating the lectures while, OBE is designed to increase the students' competencies by determining a comprehensive approach to assess and evaluate the learners achievements[5].

Though, Spady[6] presents OBE as an alternative model of reform in education which enables the system to redefine its principles and premises to offer far effective outcome of the learners, the reform of education system in South Africa that has been labelled as OBE approach which was anticipating to bring about desired outcome was widely presaged[7] while, Lombard and Grosser[8] argue on the critical thinking ability of students as an inclusion to OBE in further developing the learners' outcome and to facilitate the achievement of desirable outcome in South African Education system. Mc Kernan[9] criticizes the notion of preset outcome of an educational system that limits the speculation and inquiry of learners and leaves the curriculum developers an unwarranted authority on knowledge and understanding. He proposes an alternative procedural-inquiry model that encourages liberal education[10]. Sanyal and Gupta[11] emphasize that OBE adoption is not only to focus on the outcome that learners should achieve in demonstrating ability to respond to challenges and grab the adult world's opportunities rather it is to focus on the way of designing, delivering and documenting the contents and instructions to meet the desirable outcome[12].

Literally, the tringle of higher education system is comprised of three main elements: input; process; and output from the system. Those interested in input, use the economic rationalization as the base of their evaluation of the system, those are interested in process of resources within the educational system use managerial tools in evaluating the organization, controlling and delivery from the system as the base of their judgment while, the those interested in outcome use the result of education as the

base of their evaluation[13]. Therefore, the system reform and restructuring require that one focuses on all the elements.

Eng et al.[14] Investigate the impact of OBE implementation with the incorporation of technology innovation in the process of teaching and learning in Malaysia and they find no significant difference between OBE grade score of two semesters output in 2011. Davies[15] argues in his research that education should be more systematic and evidenced-based to lead the school in developing and practicing effective policies and practices to enhance the quality of educational outcome[16].

Donnelly[17] states that OBE is conceptually flawed, complicated to apply and is a substandard when it is compared to the terms and contents of a model for curriculum development in an educational system. In the cutting edge of curriculum development to impact the employability, OBE leads the alignment of teaching, learning and assessment activities of students with those of the learning outcomes[18].

Though a bulk of theoretical and empirical analysis relate to United States, recent studiessuch as Adedoyin & Shangodoyin[19]; Malan[20]; Davis et al.[21]; Harden[22]; Davis[23]; Harden[24]; Brady[25] describe different ways and approaches to design contents and to deliver instructions in enabling effective learning outcome as a process to suite the same objectives in different places and time horizon. They investigated and highlighted the key points for successful application of OBE as an alternative model for educators and learners in changing the educational domain from instructors' ability to students' competency.

Believing the educational institutions are more under pressure to bring a drastic difference in way offering educational services to students and this pressure leads the institutions to turn great deal of focus on the outcomes[26]. For the first time in history of higher education in Afghanistan, based on the critical evaluation of the traditional education system that its output saturated the market and encouraged employers in disbelieving the competencies and abilities of graduates both from public and private higher education institutions, the OBE has signaled out as an alternative model to gauge employment and to turn attention to learners' outcome rather than instructors' input.

In sum, departing from traditional curriculum to OBE approach at a faculty or at a university level in Afghanistan showed to be slow but constant in learning and applying the instructional materials in compliance with demand of the employers and to push employability.

In this paper, we only investigate the significant difference between the OBE and traditional curriculum as an effective mechanism to gear up the employability in Afghanistan. Although OBE shows motivating effects towards improving the competencies of students, more robust experimental studies in evaluating other outcome measures such as other areas of competencies and students' satisfaction are needed[27]. There is a vast literature underpinning the departure of educational systems to OBE model across the world, yet there is no such study in Afghanistan to investigate the recent adoption of OBE and its effectiveness in the country.

Data: In this paper, we use a set of data relevant to pre and post assessment of the curriculum revision and implementation in twenty one faculties of Kabul University such as: Economics; Computer Science; Fine Arts; Social Sciences; Chemistry, Physics; Mathematics; Biology; Pharmacy; Veterinary Sciences; Geology; Environmental Sciences; Sharia and Law; Law and Political Sciences; Journalism and Mass Communication; Policy and Public Administration; Agriculture; Engineering; Language and Literature; Psychology and Educational Sciences; and Telecommunication.

The data is retrieved from the central curriculum committee and professional development center of the university relevant to 2017 and 2019 during which the university departed from traditional curriculum to OBE curriculum as a benchmark to increase employability and play as a role model for the rest of higher education institutions in Afghanistan. In 2019, the university introduced the first batch of its graduated students who pursued their bachelor degrees on OBE curriculum to the market in Afghanistan. We use the total percentage of placements of graduated students as a proxy to measure the effectiveness of the OBE in comparison with those of the traditional one.

The dataset is arranged in two independent groups covering the percentage of placements in 2017 relevant to traditional curriculum output and 2019 relevant to OBE graduation. Table-1 provides the descriptive statistics of the data used in this study.

Table-1: Descriptive Statistics.

Variables	Obs.	Mean	Median	Maximum	Minimum	Std. Error
2017: Traditional Curriculum Placement	21	0.683	0.700	0.950	0.450	0.150
2019: OBE Curriculum Placement	21	0.848	0.850	0.930	0.630	0.062

All values are presented as percentage of placement as whole for the university.

Table-1 exhibits the descriptive statistics of the traditional and OBE curriculum graduated students' placement during 2017 and 2019 respectively. This shows that the mean value of the placement from traditional curriculum is 0.683 or 68.3% while it is 84.8% from OBE. The above table shows a weak exogeneity for maximum percentage of placement from traditional curriculum which is 95% and 93% from OBE while it presents a significant exogeneity at the minimum percentage that are 45% for traditional and 63% for OBE curriculum placements respectively.

In Figure-1 we plot the percentage of placement of the students graduated from traditional and OBE curriculum for each of the faculties (explained before) of Kabul University so one can read through more explicitly.

Methodology

This section provides the statistical models used in this paper to test the competing null hypothesis upon which a rationale conclusion can be drawn.

Variance homogeneity: In this paper, we use two independent sample (t) test to test the $H_0 : \mu_1 = \mu_2 \; vs \; H_A : \mu_1 \neq \mu_2$. Based on a wide literature in statistics, for comparing the central tendencies of two independent samples and testing the significant differences among them, equal or unequal variance (t) test is widely used in sciences[28-31]. Performing preliminary test to investigate the homogeneity of the samples' variances is an effective way to ensure whether to use equal or unequal variance (t) test[32]. Therefore, we first test the homogeneity of our samples' variances using the following equation:

$$\lambda = \frac{HS^2}{LS^2} \sim F, df = (n-1) \tag{1}$$

where λ is the test statistics following F distribution with degrees of freedom of number of observations minus one and HS^2, LS^2 are the higher variance and lower variance of our two samples respectively. In equation (1) the derived value for λ is compared with the (F) critical value at alpha 0.05 in which, if the critical value is less than λ then we reject the null and continue to estimate the unequal variance (t) test and use the equal variance (t) test if the case is otherwise[33].

Mean Comparison: Rejecting the null hypothesis of equal variance among our two samples, we use the unequal variance two sample (t) test. The model we fit for our case can be expressed as follows:

$$t = \frac{\mu_{OBE} - \mu_{Traditional}}{\sqrt{\frac{S^2_{OBE}}{n_1} + \frac{S^2_{Traditional}}{n_2}}}. \tag{2}$$

where μ is the mean value, S^2 is the variance and n_i is the number of observations in the sample? The test statistics derived from equation (2) is compared with the critical value of (t) table at 0.05. The degree of freedom (ν) for comparing with the test statistics that we estimate using equation (2) is not as straight forward but it is estimated by using the equation given by Moser, B. K., & Stevens, G. R.[34].

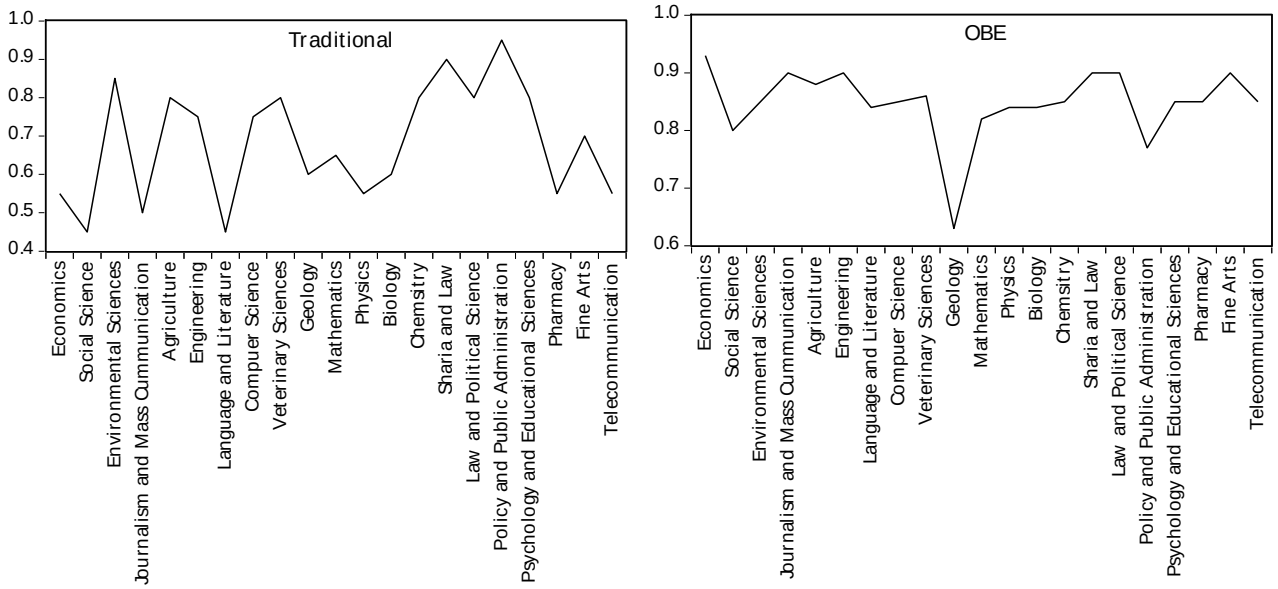

Figure-1: Plot of Placement Percentage for traditional graduate (2017) and OBE graduate (2019).

$$\nu = \frac{\left(\frac{S^2_{OBE}}{n_1} + \frac{S^2_{Traditional}}{n_2}\right)^2}{\frac{\left(\frac{S^2_{OBE}}{n_1}\right)^2}{n_1 - 1} + \frac{\left(\frac{S^2_{OBE}}{n_1}\right)^2}{n_1 - 1}} \quad (3)$$

where all parameters are as explained before. We compare the (t) test value estimated from equation (2) with the critical value of (t) using the degree of freedom derived from equation (3) in which, if we fail to reject the null hypothesis, we conclude that there is a significant difference between the mean of our two-sample represented by OBE and traditional curriculum output.

Results and discussion

Result of homogeneity: Following the appropriate testing procedures, this section presents the statistical analysis of our two independent samples variances using equation (1). Table-2 describes the results.

Table-2: Result of variance homogeneity.

Statistics	OBE	Traditional	Indication
μ	0.8480	0.6833	
S^2	0.0039	0.0225	$OBE > Traditional$
n_i	21	21	$n_1 = n_2$
		Critical Value at 0.05	p-value
λ	5.7666	3.232	0.0000***

***p<0.01, **p<0.05, *p<0.10

Note: μ indicates the mean value, S^2 indicates the sample variance, n_i indicates the number of observations in the sample and λ presents the (F) statistic value. Degree of freedom is estimated as $(n_1 + n_2 - 2) = 40$.

Table-2 shows the result of variance homogeneity of our two samples. It indicates that the λ statistics being 5.7666 is greater than the critical value being 3.232 at alpha 0.05. In addition, the corresponding p-value of the λ statistics is 0.0000<0.01 evidencing the rejection of null hypothesis of equal variance.

(t) test results: By rejecting the null hypothesis of equal variance, we continue to compute the independent two sample (t) test with an unequal variance using equation (2). Since, in unequal variance (t) test, the degree of freedom (ν) needs to be estimated explicitly, we use equation (3) to estimate the (ν) and extract the relevant critical value at alpha 0.05. We then compare the test statistics with the critical value at alpha 0.05 and make statistical inferences. Table-3 describes the results.

Table-3: (t) test results.

Method	(ν)	(t) Value	Critical Value at 0.05	P-value
t-test	27	4.6381	2.0518	0.0000***
Satterthwaite-Welch t-test	27	4.6381	2.0518	0.0001***

***p<0.01, **p<0.05, *p<0.01

Note: (ν) indicates the degree of freedom for unequal variance two sample t-test and (t) is the statistical value of t-test estimated from equation (2).

Table-3 presents the result of the t-test. It shows that the (t) Value is 4.6381 greater than the critical value at alpha 0.05 with the (ν) of 27 which is 2.0518. the corresponding p-value of the (t) Value is 0.0000<0.01which is significant to reject the $H_0 : \mu_{OBE} = \mu_{Traditional}$ and conclude that there are significant differences between the percentage of OBE curriculum output and the traditional curriculum output. In concreting the results, we also estimate the Satterthwaite Welch t-test in which we obtain the same result which further supports our findings upon which we can draw the final conclusion.

Conclusion

The higher education system of Afghanistan has suffered from almost four decades of consecutive internal war in the country. The teaching and learning process did not progress as the world was evolving. One of the areas where vulnerability of employment level was challenged was the traditional and classical approach in developing and implementing the curriculum as the base of higher education services both in private and public higher education institutions. The recent attempt of Kabul University in departing from traditional curriculum to OBE model was still an issue for debate and research. This paper focuses on the outcome of both the approaches in curriculum development and implementation in terms of its statistical feedback to local market in Afghanistan. Of this, we use a set of data covering the total percentage of graduated students in 2017 as an outcome of the traditional and the total percentage of graduated students in 2019 as an outcome of the OBE curriculum. The dataset is retrieved from the central curriculum committee and the professional development center of Kabul University. To test our hypothesis, we apply a set of statistical models and find that there is a significant difference

between traditional and OBE curriculum output expressed in terms of percentage of employability in the local market while the finding is statistically evidenced in favor of OBE.

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