AN INQUIRY INTO IRANIAN ENGINEERING STUDENTS' LIFE EXPERIENCES OF EDUCATIONAL PROGRESS OF EVALUATION

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The present study is a phenomenological inquiry into the life experiences of Iranian engineering students on the educational progress of evaluation at university. For the purpose of the data collection, twelve engineering students, electronic, mechanics, industrial, aerospace, etc. were interviewed by the lead author. The participants volunteered for the study and each interview lasted approximately 35 minutes. The adapted design was flexibility and purposeful sampling. Qualitative data collection was employed for the present study. Data were analysed through inductive analysis and creative synthesis (Glaser's seven steps). The findings revealed important patterns and themes behind evaluation. The participants had the life experiences of evaluation as being unfair, not fully based on the classroom syllabus, and call for raising professors' awareness on evaluation. They advocated a synthesis of a theoretical and practical evaluation. The participants also supported formative evaluation during a semester. The present study has a number of pedagogical implications for teacher education, teachers, testing professionals, among others.

Keywords: educational progress of evaluation; engineering students; life experiences.

Introduction

Over the last decade, research interest has been focused on the evaluating students and teaching effectiveness (Amini, 2000; Aronson et al., 2012; Clark, 2003; Dym, 2004; Hein & Maddoy, 2009; Kiran, 2002; Komeili & Rezai, 2002; Larsein et al., 2008; Larsen et al., 2008; Tam, 2008).). Although the need for such evaluation is an obvious necessity for establishing a current level of quality of the educational process and its most important constituents, numerous authors discuss teaching effectiveness, teacher effectiveness, student effectiveness and even university effectiveness without properly differentiating between the mentioned terms. Evaluating college students is a determining factor in the success of an educational system.

Statement of the Problem

Evaluation is commonly regarded as an integral part of education. How to evaluate students and when to evaluate learners are the most fundamental questions. The case is too demanding and imperative as we deal with engineering students. Different types of expectations and perceptions emerge here. We are not encountering the lower levels of knowledge rather the deeper levels of cognition, manipulative powers of students to make changes in instruments and the environment.

Iranian engineering students often are dissatisfied with the current evaluation system at universities. They believe that evaluation types and system are not in harmony with the objectives of the evaluation. The most frequently used evaluation type in Iranian universities is final exam tests. Most evaluation decisions are made on the basis of final exams. Formative assessments are rarely employed in Iranian engineering and technical universities.

Different types and trends have been recognised in the field of education. What remains underexplored is the technical and engineering students' perception and life experiences of evaluation. It is argued here that teacher education should provide technical and engineering professors with new trends and tenets to cope with the demanding nature of evaluation at universities and colleges.

Literature Review

Through evaluation, one can gain insight into the shortcoming and efficacy of educational system. Amini (2000) believes that evaluation not only provides teachers with their students' past learning, it also predicts students' future performance.

There have been different definitions of evaluation. The topic of evaluation has triggered much discussion among the professionals (Mirzaei et al., 2015; Kushins, 2007; Sirotova, 2015; Shakurian, 2011; Terzer, 2015; West, 2011).

For example, Popham (1975) defines evaluation as official measuring of the value of the educational phenomena. Bim and Field (1986) have provided a comprehensive definition for education: "evaluation is a process of determining, gaining, and providing descriptive information on the value and efficacy of goals, design, and performance and the results" (P.122).

Evaluation of educational process aims at:

1. Affecting testing through indicating shortcoming, emphasising main points, evaluating teaching methods.
2. Motivating learners;
3. Evaluating the cognition, and comprehension and learning;
4. Working out the criterion for selecting the best learners;
5. Developing the criterion for judging the efficacy of all educational factors;
6. Improving agenda and enhancing the quality of education;
7. Providing information and feedback to managers;
8. Evaluating different levels of learning (Anderman et al., 2002; Sirotova, 2015).

Thus, evaluation is significant and has different goals. It is an inseparable part of education.

Formative vs. Summative evaluation

A dichotomy was made in the educational sciences between formative and summative evaluation. In formative evaluation, programmes or projects are typically assessed during their development or early implementation to provide information about how best to revise and modify for improvement. This type of evaluation often is helpful for pilot projects and new programmes, but can be used for progress monitoring of ongoing programmes (Anderman et al., 2002; Sirotova, 2015; Stetler et al., 2006).

Notwithstanding, in summative evaluation, programmes or projects are assessed at the end of an operating cycle, and findings typically are used to help decide whether a programme should be adopted, continued, or modified for improvement (Pattinson et al., 2013; Filsecker&Kerres, 2012; Blank, 1993).

Both evaluation methods are recommended for use, when possible, to provide programme staff with ongoing feedback for programme modifications (formative) as well as periodic review of long-term progress on major programme goals and objectives (summative), and to meet regular reporting requirements (e.g., for a grantor, agency, or organisational manager) (Black et al., 2003; Shepard, 2000).

On the other hand, formative evaluations encourage an ongoing, reciprocal exchange between faculty and student(s) that can move students toward expert self-monitoring of their work and intellectual persistence. It can also move them from risk-avoidance behaviours toward a mastery goal orientation. Research on formative assessment practices also emphasises enhancing students' motivation and achievement in the classroom (Anderman et al., 2002; Sirotova, 2015).

A word of caution is necessary here. University professors as human beings may be affected by their subjective decisions. As House (2015) stated: Evaluators are immersed in the real world. Evaluators participate in the world in the deepest sense. They are subject to the same biases, politics, pressures, and temptations as others. They need to be aware of their embedded situation to protect themselves and their craft. This caution contrasts with the belief that evaluators are immune to such pressures because they are evaluators (House, 2015:151).

The present study

Design

The present study employed the design strategy of emergent design flexibility and purposeful sampling. The design is open to adapting inquiry as understanding deepens and / or situations change; the researcher avoids getting locked into rigid designs that eliminate responsiveness and peruses new patterns of discovery as they emerge (Best & Kahn, 2006). Epistemology refers to a person's "beliefs about the definition of knowledge, how knowledge is constructed, how knowledge is evaluated, where knowledge resides, and how knowing occurs" (Hofer, 2002, p. 4).

Participants

The participants of the present study were 12 engineering and technical students of Islamic Azad University of Bobab Branch, Bonab, Iran. 7 of the participants were male and remaining was female. They were between 23 and 29 (mean= 25). They volunteered for the study. They were selected through available sampling.

Data Collection

Qualitative data collection was chosen for the present study. Free interviews were employed that captured direct quotations about students' personal experience and life histories. Best & Kahn (2006) recommended the strategy in order to find about people's personal perspectives and experiences. Each interview session lasted approximately 35 minutes and the procedures were audiotaped. After the data collection, the interviews were transcribed and codified to find emergent patterns and regularities.

Analysis Strategy

For the data analysis of the present study, the adapted strategy, recommended by Best and Kahn (2006) was used. Immersion in details and specifics of the data to discover important patterns, themes, and interrelationships begins by exploring, then confirming, guided by analytical principles rather than rules; ends with a creative synthesis (Best & Kahn, 2006).

Research Question

The following research question was addressed in the present study:
What are the life experiences of Iranian engineering students of educational progress of evaluation?

Results

The participants had the life experiences of evaluation as being unfair, not fully based on the classroom syllabus, and call for raising professors' awareness on evaluation. They advocated a synthesis of a theoretical and practical evaluation. The participants also supported formative evaluation during a semester

Table 1 provides a sample of extracted sentences, summarised concepts and extracted concepts.

Table1
Extracted sentences, summarised concepts and extracted concepts

Extracted sentences	Some professors taught effectively. Thus, we passed the exam with ease. Unfortunately, some open-book exams are so difficult that we cannot answer them. Unfortunately, some evaluations are made solely to assign scores to students. They do not evaluate students' understanding of the course materials.
Summarised concepts	Adequate teaching leads to desirable educational progress Taking some open-book exams are so demanding even in open-book format Evaluation is sometimes made solely for assigning scores.
Extracted concepts	Good teaching is a pre-requisite for good testing. There is a relationship between educational progress and good teaching. Open-book exams are not always easy. Some university professors are not careful about posing questions of exams. Some university professors do not take students' capabilities into account. Some university professors do not take syllabus as the basis for designing open-book questions.

The findings of the present study suggest that Iranian engineering students advocated evaluation prior to the final exam. The results also suggest that most students supported synthetic evaluation, midterm exam combined with classroom assignment. The participants were interested in taking different progress tests during a semester. It seems that such evaluation triggers competitive environment among learners. It is believed that final evaluation cannot be an appropriate criterion for estimating learners' performance and motivation. Accordingly, the greater the number of the classroom tests in a semester, the more precise the results of the final exam are. Furthermore, self-evaluation can prepare learners better for final exams.

It may be claimed that mid-term exams are the most effective of all types of exams is formative evaluation, focusing on strategies and processes of learning during an educational year. The best form of evaluation comprises a final exam completed with one or two evaluation during a semester.

The results also suggest that engineering professors should employ both theoretical and practical methods for evaluating their own students. They should, also, employ various methods and different test types for evaluating students.

Taken together, the findings and key themes and patterns can be summarised as follows:
1. The evaluation is not based on classroom syllabuses.
2. Attitudes and emotions affect the evaluation process.

3. Fairness and justice are essential for evaluation.
4. Differences in expectations of the participants will lead to illogical evaluation results.
5. Evaluation approaches are inadequate because some professors are inattentive.
6. In-service classes are needed to raise awareness of the professors.
7. Precision and expertise are needed in evaluation.
8. Evaluation is not based on a sound principle.
9. Quantitative measurement should not be promulgated widely.
10. Sometimes evaluation is inhibitive.
11. Evaluation is occasionally passive.
12. A lot of errors can be observed in evaluation.
13. Positive attitude should be encouraged towards proper evaluation

Discussion

The present epistemological study attempted to shed light on Iranian life experiences of engineering students. The findings indicate that some participants were dissatisfied with evaluation procedures and policy at university. It is because the evaluation content was not in harmony with the classroom syllabus or the evaluation was not simply fair. Most of the participants also believed that the professors' expectations are too high and they could not meet them. The present study also calls for raising professors' awareness about ongoing and dynamic evaluation. The engineering professors should not assume evaluation as one-shot and cross-sectional. Instead, they should consider it as formative one.

The findings suggest that the decisions based on final examinations at Iranian universities are not unfair. This, in turn, implies that university professors should be as fair as possible and incorporate objective evaluations into their curriculum. The findings also show those university professors' emotions and attitudes towards evaluation *per se* and learning process may affect evaluation.

We suggest that university professors' awareness should be enhanced on evaluation techniques. To do so, in-service classes and teacher education would be beneficial. Another issue at hand is that few technical university professors are familiar with the theories and approaches of evaluation of educational progress.

Iranian University students' dissatisfaction with the current methods of evaluation at Iranian universities can be attributed to the professors' adherence to traditional methods of educational evaluation. It might be the fact that evaluation methods for all university disciplines including humanities and engineering ones are the same: one cannot find different measuring systems and criteria for those disciplines.

Another source of students' dissatisfaction with current methods of evaluation of educational progress might be the fact that university professors solely evaluate their students' memorisation of the course materials. This will leave little or no room for higher degree of cognitive involvement e.g., judgement and evaluation, among others.

One of the pedagogical implications of the present study is that quantitative measurements techniques should not so much be promulgated. There should be a call for combining quantitative and qualitative approaches in evaluating educational progress.

The present study also revealed that evaluation can be passive and inhibitive. Future inquiries should delve into the issue and identify factors leading evaluation to be passive and a barrier to learning and demotivating learners.

The study has a number of limitations that should be confessed: first, a small number of technical and engineering students participated in the study. Second, a great deal of time might be much informative of the participants' expressing their life experiences on the issue.

Conclusions

Considering the significance of evaluation of educational progress at universities, the present study sought to shed light on the barriers to implement it appropriately and on its positive dimensions. The study revealed a number of key concepts and patterns at Iranian universities.

Future research should look at the demotivating factors affecting the evaluation of educational progress. Furthermore, inhibitive variables of evaluation should be pinpointed by future studies. It is recommended that other studies should employ different theoretical paradigms and approaches to delve into the evaluation process.

No doubt, a large number of scholars advocate quantitative and objective techniques of evaluation of educational progress. Notwithstanding, it can be claimed that qualitative as well as impressionistic approaches for evaluating learners' progress should be employed hand in hand with quantitative and analytic approaches.

Future studies can take other research designs and paradigms as their point of departure and get insights on the changing nature of learners' perception of evaluation and their attitude on it.

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