Students' Perspective: An Investigative Study on the Effectiveness of the Curriculum Delivery for the Libyan Manufacturing Industry

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Abstract -— The role of the future engineers and technicians in these technically developed societies is becoming more challenging because of the globalisation of manufacturing industry and engineering practices. In addition, the advancement of technology has greatly influenced the delivery system of technological and, Technical and Vocational Education and Training (TVET) worldwide. The development of curricula has stressed the need for flexibility in structure and modes of delivery of TVET programmes. Our society today faces significant challenges including international competition, the global environment, an increasingly diverse population, and a rapid growth in the population. As a result, the engineering education and TVET colleges for the future should be broad-based engineering programmes for easy mobility, flexibility and adaptability to the new changing technology and environment. Therefore, a more dynamic curriculum delivery for the engineering education is needed. Realizing the importance of producing a highly competence engineers of the future, the Libyan Higher Education Institutions (HEIs) should put a considerable pressure to the universities and TVET institutions to produce engineers and technicians who are competitive in the marketplace. The aim of this paper is to examine to describe the results of a survey which was conducted in Libya (the perceptions of university engineering students to the curriculum delivery). To achieve this goal a questionnaire has been designed, and distributed to students at higher education to explore their views in this regard. Conclusion points out that the delivery of the curriculum is mostly based on traditional classroom fashion and very little has been done to promote new innovative delivery methods.

Keywords —**TVET, Curriculum delivery, Work-Based learning, Libya.**

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I. Introduction

Higher Education (HE) in general and Technical and Vocational Education and Training (TVET) in particular have always played a larger role in the economy as a producer of human capital and as a centre for knowledge and development. Traditional educational practices centres on "inputs" [23]. Therefore, graduates are unable to perform well in their job and hard to get the desired jobs. This perspective needs to be change it is not just getting good results but they can meets the needs of the potential employers in demonstrating their competencies. Generally, the system exposed students to a segment of curriculum over a time frame. At the end of the module, an examination is usually given, and grades are assigned regardless of whether all students have achieved mastery of the material learned. This perspective needs to be change where the "outputs" is not just getting good results but what importance they can meets the needs of the potential employers in demonstrating their competencies. The interaction in class today is more on one-way communication, where teacher is doing all the talking, while students are listening. As a result, students are being passive, thus lacking of some skills such as communication, critical thinking, and making decision. Due to these problems, graduates are unable to perform well in their job and hard to get the desired jobs.

Therefore, this also leads to the increment of number of unemployed graduates. With more demanding future employers, educators have to move one step ahead by changing their way of teaching TVET is one of the key branches of education which produces the manpower resources that make industry more productive. To this effect, Libya has considered TVET colleges as one of the most important factors leading towards the solution of the nation's problems, and its important role in economic and industrial development cannot be easily ignored [1]. However, TVET is an important sub-sector of the public education system in Libya. It has been subjected to an active process of re-designing and has become the focus of the government's strategy in recent years [8] [9]. To address this important issue a network of TVET institutions were introduced in Libya, during 1990s for the purpose of enhancing the supply of skilled manpower needed for the manufacturing industry and the socio-

economic transformation plans. The TVET colleges are post-secondary institutions and offer theoretical and practical based curriculum. The main objective of these institutions is to provide highly qualified human resource to fulfil the requirements of the socio-economic development plans [11].

II.   Curriculum Delivery

Providers of TVET should use a wide range of delivery methods including part time, full time, flexible learning, work-based learning, distance and open learning to accommodate the diverse needs of the learners and their learning styles. There have been many significant researches on developing new methods of delivering engineering programmes. These include Work-Based Learning (WBL), [19], Project/Problem Based Learning (PBL), Open/Distance Learning, [5] and Learning Contracts [15]. PBL is generally regarded as a new method for engineering education [12]. The key assumption of PBL is that learning begins by dealing with problems which happen in the professional environment [21]. In general, they argue that, this method seems to be a beneficial and promising approach to help students with deep reflection in order to develop process competencies in a PBL setting. Experiential learning is a theoretical root for PBL approach. Nonetheless, not all PBL approaches were built on the same experiential learning theories. For example, in Denmark, the PBL approach was built on Dewey's theories of experiential learning. Other PBL approaches built on Kolb and other theories of experiential learning [12]**.** This diversity does not bring significant differences among various PBL approaches practiced around the globe. The key point here is that PBL is widely accepted as the most practical approach for experiential learning particularly in terms of developing the generic and humanistic skills of the students [18]. The study finding shows that the PBL method has successfully developed many of the essential humanistic skills of the students [18]. This study is among a number of studies conducted purposely to prove the effectiveness of a systematic PBL approach that could enhance not only the academic but also the generic part of the learning. The work-based learning specifies work-related learning opportunities unique to the workplace that enables students to apply the academic and occupational knowledge, skills and attitudes they have obtained in the classroom [6]. According to [16], the *"concept of Web-based experiments has revolutionised engineering laboratory and practical work"* (p. 213).

III.   Methodology

Data used in this study were based on a survey data conducted among nine (HEIs) (Universities/Institutions) in Libya. So as to meet the objectives of this study, quantitative data using a questionnaire was generated to obtain information to examine phenomenon under investigation. The questionnaire aimed to elicit the students' perception of the skills and knowledge they are acquiring during their study in different Libyan Higher Education Institutions (HEIs). The questionnaire used a six-point Likert scale style format. This format allows the students and engineers to place themselves on an attitude continuum for each statement-running from (1=Strongly Disagree to 6= Strongly Agree) [17]. The sample size was 625 for students, and this represented a high response rate (85% for students). The results of curriculum delivery was analysed and are presented in this paper.

IV.   Result Of Curriculum Delivery And Discussion

A.   *Students' Perception*

(Q1). Timetable Design in Relation to Accommodating Students Needs

The researcher believes that this question (Q.1) is considered an important factor to students since curricula are central to the process of their education. Appropriately designed timetable would serve students' best interest and accommodate their needs in terms of hours of attendance at the course. Furthermore, appropriately designed timetable can lead to increasing students' satisfaction, and also helps sustain high academic and quality standards, as it ensures full attendance by students and motivates them to approach their studies proactively rather than reactively. However, (58.1%) of them expressed their disagreement with the statement; whereas 41.9% of them agreed with the statement.

This clearly indicates that the timetable was not adequately designed to cater for accommodating students' needs. It can also be argued that students had no say in designing the timetable, which reflects the top-down bureaucratic approach to designing timetable. From the researcher's own experience, timetables are designed by the departments concerned or in coordination with other departments and given to students without involving them in this practice.

(Q2). Availability of Tutors to Help Students

Students were also asked in Q.2 whether their tutors are available to help them. This is an important issue due to the fact that interaction and aspects of interaction between students and their tutors is well established as an important feature of the learning process [22]. The literature [3] [10] [14] clearly shows that this is one of the key concepts in education as well as in open and distance learning research. The majority of the students (68.2%) agreed with the statement. It can be argued that tutors are available to most students when they need help. Those who disagreed with the statement might, have not interacted with their tutors, possibly due to inappropriate design of the timetable, or even some of them failing to regularly attend their lectures or tutorial sessions. The researcher, from his experience as a student, believes that students require continual tutor support to keep them involved in their studies as well as to help motivate them, which eventually leads to students' satisfaction with the course they study and become more active in classroom

discussions and tutorial sessions. The availability of tutors is important in that students can maintain contact with them and ask questions during that contact, whether during a lecture or during tutorial sessions.

(Q3). Appropriate Allocation of Tutorial Sessions

Respondent students were asked (Q.3) whether their tutorial sessions are appropriately allocated. This is an important issue, as it related to timetable design. More students disagreed (37.6%) than agreed (27.7%) with the statement. Students were also more inclined to strongly disagree than strongly agree with the statement. Data in this question also indicate that more students (34.7% of the sample) were indecisive in their response, either slightly agreeing or slightly disagreeing with the statement. This indicates that tutorial sessions have not been appropriately allocated.

This pattern of response is consistent with that relating to improper timetable design (see Q.1 above); whereby more students also indicated their disagreement with proper timetable design to accommodate their needs than those agreeing with that statement. This finding and that analysed in (Q.1) above, clearly indicate that it is necessary to involve students in designing timetables to accommodate their needs.

(Q4). Availability of Study Materials

Students were also asked whether or not study materials are available in the library (Q.4). The majority (61.9%) of them expressed their disagreement with the statement. This is an important issue for university students to have textbooks, academic and professional journals and other materials relevant to their study available for them. They are required by students to read about the lectures delivered, as well as by academic staff members to prepare their notes and lectures. The pattern of responses clearly indicates that such study materials are not available in quantities that students can have access to them. This is evidence that the library cannot meet the academic needs of most students.

It may also point to poor access to the Internet and academic websites to obtain study material needed. The researcher believes that economic transactions imposed against Libya for almost three decades have contributed to this poor availability of study materials. This has resulted in reliance on old, some obsolete literature and denying students and staff to investigate and familiarise themselves with more recent developments in various spheres of knowledge.

(Q5). Use of Modern Technologies by Lecturers to Deliver their Modules

With regard to their lecturers using modern technologies in the delivery of their modules (Q.5), more than half of students (52.8% of the sample) agreed with the statement, whereas 47.2% of them disagreed with the statement. This may indicate that not all lecturers have access to modern technologies (computers, the Internet, etc.) to help them prepare their lectures and deliver their module, and possibly that lecturers in some of the institutions involved in the study have access to modern technology, whereas others in other institutions may have

a limited access, or very poor access to such modern technologies. This might be a factor in lectures not delivered to students up to the standard required; hence not including recent developments concerning some courses. Generally the student's views that the role of teachers input in teaching is still important and relevant. Especially concerning the early part of their learning. Students illustrated that teacher centred learning is still needed such as theories and general topics should be taught before going into the application parts. In addition common basic subject should be thoroughly taught which also include general academic disciplines. The role of teachers also to trained the mind and promoting reasoning as to build critical thinking and experience. The researcher believes that such modern technologies should be available to both students and academic staff to help them in their study and in preparing lectures using most recent developments in their field of study. The researcher also believes that engineering practical work is currently more geared to using modern technologies to carry out experimental and applied work. It is also due to the UN sanctions that many Libyan educational institutions could not have access to modern technologies.

(Q6). Promoting Student-Centred Learning

Data shows that (Q.6) whether the delivery strategy gives them enough confidence to manage their study. Slightly less than two-fifths of the students (38.1%) agreed with the statement. A slightly more (39.4%), however, were not decisive in their responses, being either slightly disagreeing or slightly agreeing with the statement, and almost one quarter of them (22.6%) expressed their disagreement. This indicates that a large percentage of students were not sure whether or not the delivery strategy has given them enough confidence to manage their study. This is a serious problem that should be tackled by the departments concerned to boost the confidence of a large number of students to help them manage their studies. The researcher, from his experience, believes that the delivery strategy depends basically on dictating lectures by their tutors, mainly due to the shortage in the availability of study materials. This means that students depend on their tutors in providing lecture notes, and the delivery strategy is far from being a student-centred learning strategy. Again, this pattern is consistent with the limited or poor access of students to modern technologies and that many of their lecturers experience such limited or poor access to such technologies, as explained in (Q.5) above. Authors of [2] argue that the idea of independent learning or student-centred learning has little place in the Libyan system. In the context of life-long learning, this is a matter of concern and reflects the 'spoon-feeding' approach where students merely memorise the information provided by the teachers. [22] showed that three main complaints received regarding graduates include lack of creativity, lack of initiatives, and poor communication skills. Due to these problems, graduates are unable to perform well in their job and hard to get the desired jobs. Thus, this also leads to the increment of number of unemployed graduates. With more demanding future employers, educators have to move one step ahead by changing their way of teaching.

Given these observations the general objectives of the study is to identify student's view and perception of teaching whether the profound effectiveness of learning is based on teacher-centred or student-centred. Second to justify that there is a needs to change the approach of learning which is student-centred such as problem based learning or active learning [7]. On the other hand, teachers still play an important catalyst in teaching and creating learning among students.

(Q7). Delivery of Practical (Laboratory) Classes

Respondent students were also asked (Q.7) whether the laboratories are well equipped to deliver the practical part of the course. Practical (laboratory) work is vital for engineering students where students can apply theory in practice and prepare them for their future career. It seems that there had been more disagreement (39.4%) than agreement (30.0%) with this statement. Data illustrated in also indicate that more students (30.7% of the sample) were indecisive in their response, being either slightly agreeing or slightly disagreeing with the statement. This is evidence that the laboratories are poorly equipped and do not meet students' needs and requirements of practical lessons. This pattern of response clearly indicates that the study is more theory than practice. This poor delivery of practical lessons does not help students develop their practical skills and adequately qualify for future work. According to [2] in general there is no enough equipment and facilities in some institutions (such as computers and laboratories, etc.) also he found clear evidence of the reported feeling that educational technology was not well integrated into classroom instruction. Authors of [13] suggests that laboratory work in engineering education can certainly influence students' learning skills and can also help in understanding important concepts in the course.

However, laboratory procedures are vital learning tools in engineering and technology education that can be used to increase experimental instruction in engineering courses. As a result, laboratory accreditation is a very important and essential factor in the quality of engineering education [20]. Authors of [20] also add that engineering students need to be prepared for the increasing use of advanced and appropriate technology in their future workplaces. Moreover, the education system lacked adequate facilities, such as libraries and laboratories, especially in the science sections [4].

(Q8). Availability of Suitably and Appropriately Equipped Lecture Theatres/Room

When asked whether their lecture theatres/rooms are suitable and appropriately equipped (Q.8), most students (44.0% of the sample) disagreed with the statement, whereas one-quarter of them agreed with it. A slightly more (30.4%), however, were not decisive in their responses, being either slightly disagreeing or slightly agreeing with the statement. Here again, there had been more strong disagreement than strong agreement. This statement ties up with the statement above (Q.7). It seems that higher educational institutions involved in the study are poorly equipped with lecture theatres/rooms, as well as poorly equipped with laboratories. According to [23]

lecturing is an important aspect of university instruction; it is not necessarily the only or best way of engaging students in the ideas and information This poor availability of such vital facilities would reflect negatively on students' attainment and preparation for employment. Lecture theatres/rooms, for example, are not properly equipped with Overhead Projectors (OHPs), or linked to the Internet; simply put, they are not fitted with the basic modern technologies to facilitate the delivery of lectures to students.

(Q9). School Support to Learners with Diverse Backgrounds

Students were finally asked (Q.9) whether their school provides support to learners with diverse background. Most respondent student (62.1%) expressed their disagreement with the statement. This is a clear indication that schools failed to support learners with diverse backgrounds. This pattern is consistent with previous questions that expressed concerning (Q.6), whereby the delivery strategy did not give many students enough confidence to manage their study. For example, there are no special arrangements for disabled students to use the school facilities, or the library; this would discourage people with certain physical disability to join higher education.

V. Conclusion

In summary, to impose a certain education system without taking into account the diversity and the aspirations of those for whom it is designed, is to go against the nucleus of human beings, and their intellectual and cultural aspects. Thus from the findings it is clearly defined by the students that they need a new paradigm in the way they want to learn. The role of teacher is still needed in departing the fundamentals of the subject they learned. However, the learning culture that was in place all this years was almost exclusively teacher led, there was passivity among the students , a practice of routine learning was rampant, with little reliance on creativity, initiative and independency. In addition, one critical way to improve the generic skills of the students is to opt for a proper approach in teaching and learning called the experiential learning in which learning centred around the students rather than lecturers. Unfortunately, most of the public universities are still prone to the rampant utilisation of lecturer-centred teaching and learning approaches. They are far from realising the important of student-centred and experiential learning approaches in order to suit the needs of the students, the current knowledge and the technological advancement. Looking at Libya and the world at large has undergone rapid socio-political and economic change. This has direct implications for education. To meet these new needs, there is an urgent need to improve curriculum and their delivering and teaching and learning in the higher institutions of learning so that it become more responsive and action oriented vis vis students centred. This approach if properly implemented can lead to increased motivation to learn, greater retention of knowledge, deeper understanding, and more positive attitudes towards the subject being taught.

Furthermore, the changing demographics of the student population and the more consumer/client-centred culture in today's society have provided a climate where the use of student-centred learning is thriving. However, and based on the above findings and discussion, it can also be concluded from the students' responses to items relating to curriculum delivery that most students agreed that their tutors were available to help them, and that lecturers use modern technologies in the delivery of their modules, whereas only some of them agreed that the delivery strategy gives them enough confidence to manage their study; more were not decisive in their responses. Though, most of students disagreed that the timetable's design was not accommodating their needs; their tutorial sessions were appropriately allocated; study materials are available in the library; the laboratories are well equipped to deliver the practical part of the course; the lecture theatres/rooms are suitable and appropriately equipped; and their school provides support to learners with diverse background.

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