

## **The Importance of Industry Links in Teaching Pedagogy: A Higher Education Prospective**

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### **Abstract**

*The Importance of Industry links in Teaching Pedagogy is a vital aspect for any effective teaching methodology. All educational institutes need to maintain strong industry links to maintain current and appropriate qualifications. Furthermore, these industry links could be achieved via joint research and educational programs, which also allows students to have the opportunity to be involved in industry projects and gain important work experience. As part of this close collaboration, companies should sponsor more graduate students annually which in-turn increases their employability rate. Moreover, these issues and the graduate employability is a fundamental outcome of an effective teaching pedagogy methodology such as Industry Oriented Education (IOE). This paper will discuss various elements of Industry Oriented Education (IOE), which is the basis of Industry links in an effective Teaching Pedagogy environment. These elements include job acquisition and advancements, learning on the job and employment readiness.*

**Keywords:** Industry Oriented Education (IOE), Teaching Pedagogy, Graduates Skills Sets, Graduates Employability, Higher Education

### **Introduction**

In confronting many challenges that the future may bring, human kind sees in education an indispensable asset in its attempt to attain the ideas of effective education. Effective Education should implement (Saroyan and Frenay, 2010): i) Greater involvements and interactions between industry and educational institutions, ii) Growing research links between industry and the educational institutions, and iii) Investment for Research and Development in the educational institutions.

Furthermore, on-going assessments need to be frequently revised and updated to meet the ever changing industry's requirements (Burke, 2012). Therefore the main focus of an effective education should be the link between the industry and the educational institution; and thus the creation of Industry Oriented Education (IOE) methodology. Moreover, a review of Australian Higher Education, by the Department of Industry (2008) indicated that:

1. Teaching pedagogy must meet the Australian community and economy needs.
2. Transforming Australian Higher Education systems through improving and maintaining quality of teaching.

In addition, the Guarding (17<sup>th</sup> Oct, 2011) stated that, "*Universities must build more and more industry links to improve graduates employability*". Besides it argued that, "*UK graduates are struggling with the current job markets, so the universities must boost their links with industry to remedy this. Furthermore, we are seeing more forces in the Higher Education market place on degrees sponsored by employers, formalized assessments for work placements and the like; but the pace and innovation of such activity must increase*".

Such statements clearly indicate that the importance of Industry Oriented Education (IOE) cannot be over-emphasized. Industry Oriented Education (IOE) is an approach to learning from an industry perspective (Garrison and Vaughan, 2011). With traditional teaching methodologies in educational environments, the conventional pathway is to build the foundation learning through subject based teaching of, mathematics and sciences (i.e. physics, chemistry) autonomously. Subjects based on the knowledge required for the discipline usually follow on from this. The problem with this traditional methodology of learning is that there is no close relationship with industry's ever changing requirements (Ennew, 2012).

Traditionally IOE was applied to vocational education, i.e. Tertiary and Further Education (TAFE in Australia, and alike), and was only offered to sub-degree education and industry training. However, IOE is now utilized to most undergraduate degrees as well as some Postgraduate degrees including Master's degrees. This reposition was initiated based on many diverse employer recommendations (Hager et al. 2012). More and more employers are suggesting that the educational institutions must work more closely with the industries in order to teach their (industry's) unique and specific needs. Some of these suggestions are based on the following concerns (Sterling, 2010):-

- Whether educational institutions can keep up with industry's changes and alterations in terms of job requirements.
- Educational institutions need close consultation with external entities before launching specific courses for specific industry disciplines, i.e. a new Engineering degree program.
- Educational institutions need to offer classes more closely tailored to the real world situations. Thus these institutions should partner with companies to offer the curriculum that will make the students more valuable to the various companies.

Responding to these concerns requires the optimization of the graduates skill sets. Generally, structural unemployment issues are concerning because the graduates skill sets possessed do not comprehensively match the skills required (Stewart, 2012). By working more closely with the industry, the educational institutions will not only be able to produce graduates who are more appropriately skilled, but also professionals who are more likely to succeed in the workforce (Ball, Gleason, and Peterson, 2015).

Transitioning Higher Education into the 21st century (and beyond) is a complicated issue, with numerous alternating matters including employment readiness and the graduate's abilities. There are various authors who strongly argued the significance of graduate's abilities to meet the real world challenges. McLean (2006) argues that *"at universities and training colleges the students have been taught to know, but have not been allowed to feel"*. This is another significant indication of teaching students the 'ability to do' what they have been learning. As our societies are constantly expanding, the classification of education needs to be revised regularly to display a more close relationship with the industry (Irvine, 2012). This requires the students spending some time actually working to see first-hand what they are being taught is indeed practice.

The most significant issue for any teaching program is the actual educational institute need's to maintain strong industry links and presence (Hunter, 2012). As already discussed, this could be achieved via joint research and educational programs, which allows students to have the opportunity to be involved in industry projects and work experience. Furthermore, the educational programs must be designed to produce graduates that are work-ready (Stewart, 2012). This means developing graduates who are multi-skilled, broadly focused with multi-disciplinary technical competence and, have the ability to take a systems approach to design and operational performance. Thus developing and conversing from theory to practice (Purdy and Walker, 2013).

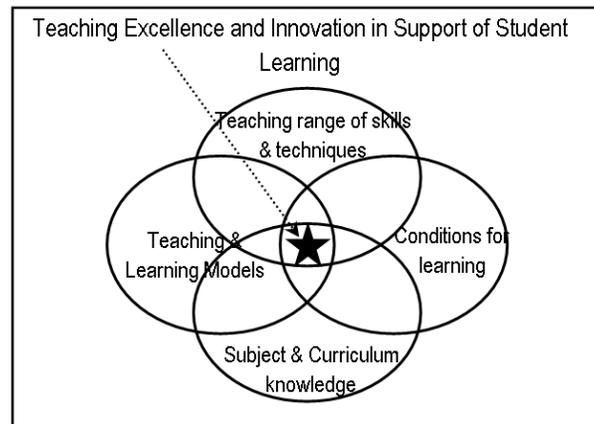
Moreover, this industry collaboration is also important aspects for any Professional Accreditation. The provided programs need to be fully accredited by the relevant industry professional association to emphasize the industry relevance. These professional accreditations ensures that the students are recognized as professionals, not only nationally but also internationally, hence endorsing that the students are internationally recognized.

All of these matters emphasize the significance of IOE as the basis of industry links in an effective teaching pedagogy environment.

### ***Teaching Pedagogy (Higher Education)***

Queensland's Department of Education, Training and the Arts (DETA - Australia) defines pedagogy as: *"Pedagogy is the art of teaching. Effective pedagogy, incorporating an array of teaching strategies that support intellectual engagement, connectedness to the wider world, supportive classroom environments, and recognition of difference, should be implemented across all key learning and subject areas. Effective pedagogical practice promotes the wellbeing of students, teachers and the school community - it improves students' and teachers' confidence and contributes to their sense of purpose for being at school; it builds community confidence in the quality of learning and teaching in the school"*.

In addition Barrett and Moore (2011) explain, “*Pedagogy goes forward when we find understanding that makes the knowledge stick*”. Furthermore, they correctly argued that there are four multiple knowledge needs (Pedagogy Theories) within the learning environment; as shown in figure 1.



**Figure 1: The Four Multiple Learning Needs (Barrett and Moore, 2011).**

These four “multiple knowledge needs” within the learning context must be carefully examined and addressed. As the demand in Higher Education is rapidly growing world-wide, educational institutes are also changing their teaching methodology to respond to this challenge (Burke, 2012). Barrett and Moore (2011) accurately argued that the main focus point of all the four multiple learning needs, could be called the “teaching excellence and innovation in support of students learning”. This center point is important since it not only covers all the four multiple learning needs, but it is also establishes the basis of Quality for teaching pedagogy (Ball, Gleason, and Peterson, 2015).

In addition to the above multiple knowledge needs, the teaching range of skills and techniques is another fundamental issue. Educators are often mentors and critical guiders that are required to make assessments on learner behavior and, examining (on a student by student basis) what needs must be met (Goodling, 2014). This needs to be carefully implemented in order for the learner to gain maximum benefit from subject content (Cullen, Harris, and Hill, 2012).

Effective teaching pedagogy in the Higher Education needs to be carefully planned and be based on the strategic directions. These strategic directions need to consider not only the pedagogy environment but also the involvement of Industry Oriented Education (IOE) in the 21<sup>st</sup> century.

### ***Industry Oriented Education (IOE)***

According to Forbes.com, one of the main issues for high education is the “workforce development”. As stated “*workforce development is taking on greater importance as employers are once again hiring but they are still having difficulties finding applicants with the needed and desired skills*”. This is not only applicable to USA but also to the rest of the world (Turner, 2011). Workplace readiness skills do not only include personal qualities, technology knowledge and skills, but also professional knowledge and skills (Peary, 2014). For professional knowledge and skills in particular, “job acquisition and advancements” are also of importance (Stewart, 2012). Another words, effective professional knowledge and skills does not only include possessing the appropriate skills sets necessary to performs the required job tasks, but also been able to excel and seek promotion in the future. Incorporating these fundamental issues are the key benefits of collaboration industry with the educational institutions (Turner, 2011). Thus as a part of IOE process, linking industry would allow the ability of graduates not only to do the job better but also excel in their careers.

Furthermore, IOE broadens skills in case of changes or preferences in future employment (Ball, Gleason, and Peterson, 2015). Effective IOE needs to be reflective-based on the required work skills, not only via formal but also in-formal education. The relationship between education and employability is very close (Barrett and Moore, 2011). Effective education through life-long learning updates knowledge and establishes new skills via methods such as “learning on the job” methodology (Barrett and Moore, 2011). Methodologies such as ‘learning on the job’ combines training and education to equip better employees such as medical doctors, nurses, and engineers.

Such professional enhancement tactics not only updates and modernizes people’s skills, but also improves the (professional) community’s productiveness (Irvine, 2012). Although currently such training education is offered by many educational institutions, there are more needs for such training organizations world-wide. This requires the implementation of specific educational modeling which embraces the educational issues of the 21<sup>st</sup> century and beyond (Peary, 2014).

One of the biggest advocates of IOE and its philosophy was Jacques Delors. In his report, Jacques Delors provides the following explanation with regards to education: *“education must transmit efficiently and on a massive scale, and increasing amount of constantly evolving knowledge and know how adapted to a knowledge driven civilization, because this forms the basis of the skill of the future. At the same time, it must find and mark the reference points that will make it possible, on one hand, for people not to be overwhelmed by the flows of the information, much of it ephemeral, that are invading the public and the private domain and, on the other hand, to keep the development of the individuals and the community as its end in view”*.

Figure 2, provides the generic pillars of education adopted from Jacques Delors Pillars of Education.

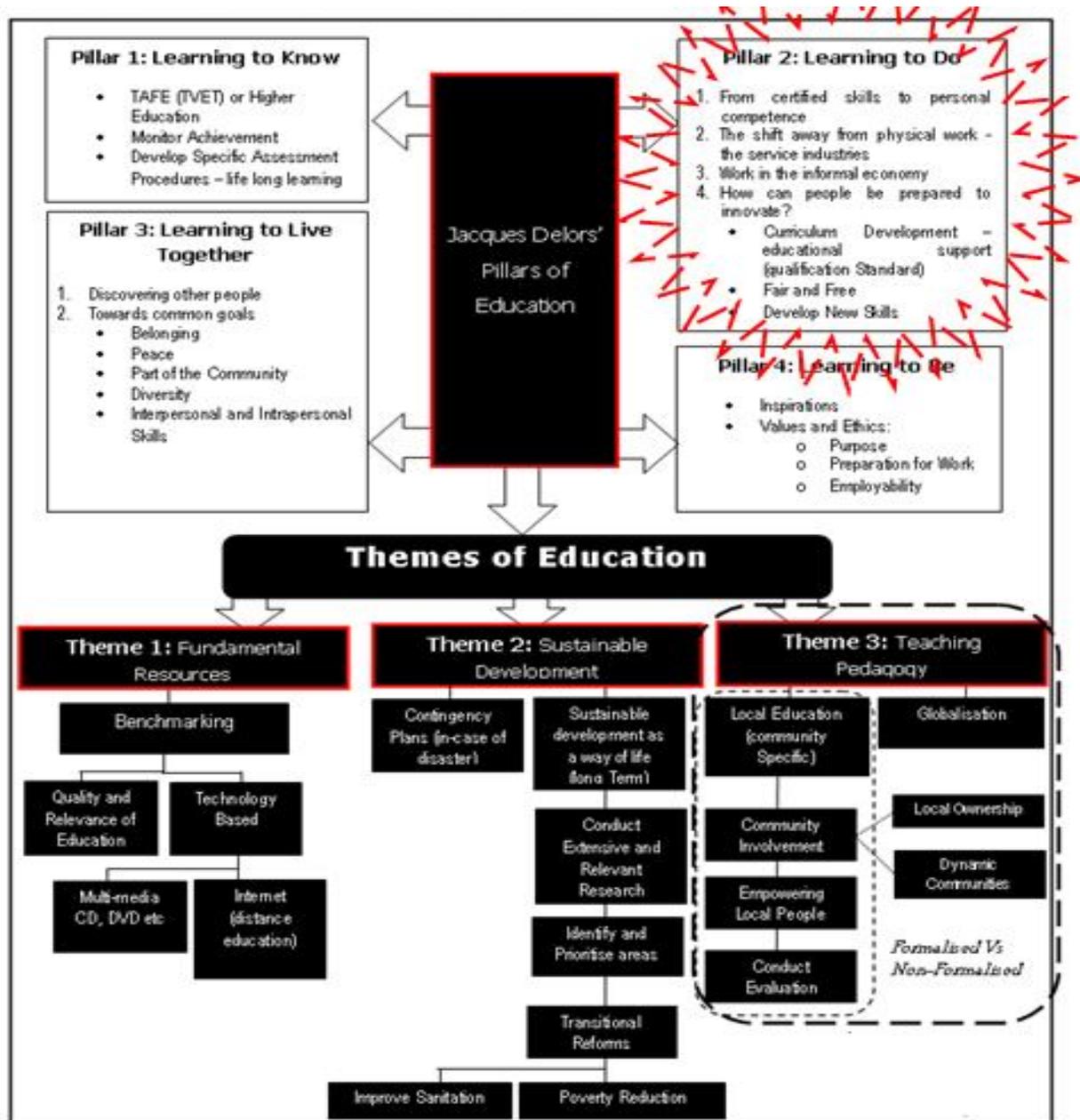


Figure 2: Pillars of Education (Adopted from Jacques Delors Pillars of Education)

As it can be noticed, Jacques Delors's pillar 2 (Learning to Do), provides yet another justification of IOE. In relation to the Pillar 2 (Learning to Do), Jacques Delors states "learning to know and learning to do are to a great extent in-dissociable, but learning to do is more closely linked to the question of vocational training". Tertiary and Further Education (i.e. TAFE in Australia) provide effective vocational training, which is a type of IOE training. This provides a more hands-on approach rather than more traditional theory-based methods taught in the universities. However, even universities have begun to understand the importance of employment readiness in their graduates; hence they offer various vocational based training such as 'Industrial Based Learning' (Schiewer, 2013). As already discussed being work-ready is significant for any economy, and thus the majority of employers prefer their graduate (new) employees to be work-ready, with less time and money required on further training of these individuals. This is important in a competitive economy where the lack of resources is quite high (Hager et al. 2012).

Moreover, Jacques Delors points out, "The function of learning is not limited to work but must respond to the broader objective of formal or informal participation in development. It is often as much a matter of social as of occupational skills". It must be acknowledged that there is no single method of an effective educational delivery system. For nations to be productive, they need to possess flexible educational approaches (Garrison and Vaughan, 2011). This flexibility is important to effectively cope with uncertainty and to share a part in creating a successful future (nation building). Another important element of Delors Pillar 2, includes, curriculum development, which needs to consider qualification standards that are required by the external bodies such as the Institution of Engineers.

In addition, in embracing IOE as an effective teaching pedagogy one needs to investigate this relationship more closely.

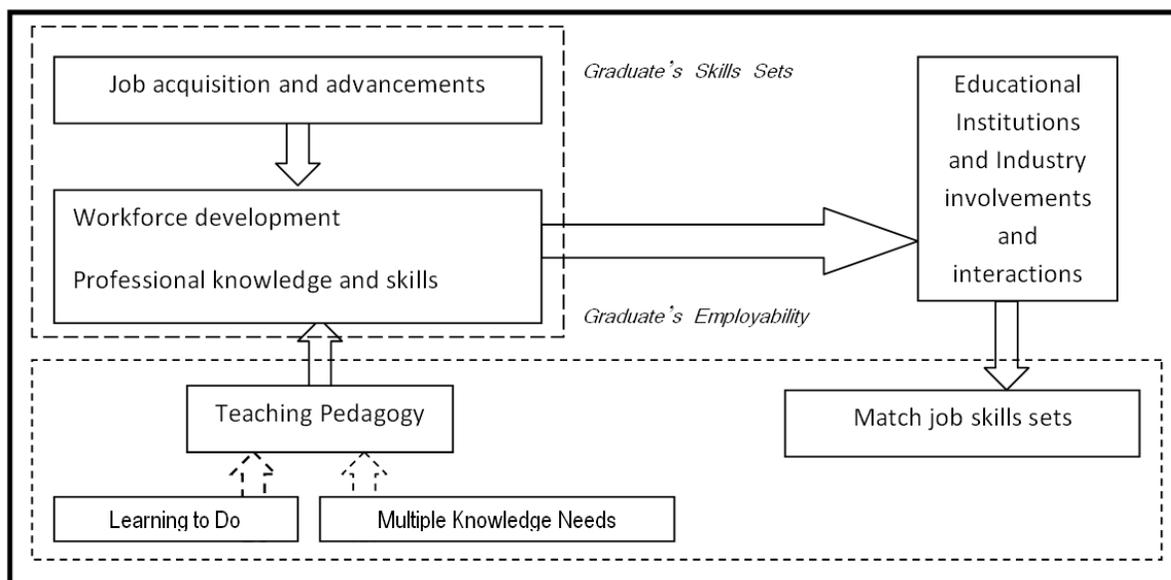
### ***IOE and the Teaching Pedagogy***

Industry links have been part of effective teaching pedagogy for a long time.

Moreover, industry based learning which typically involves three to six months work place tuition have also been utilized as a part of curriculum development for many years. However due to ever changing nature of many industries, the "industry links" are now even more challenging. Generally the industries are shifting rapidly due to new (Goodling, 2014):-

- Inventive design options for various Engineering solutions.
- Pioneering process advancements for various Engineering developments.
- Innovative tools such as new Software for design, modeling and other purposes.

Commonly program and course review occur every three to five years (Burke, 2012). This now need to be occurring every one to two years to keep up with the industries ever changing environments. Thus the "industry links" need to be more rapidly updated to produce work ready graduates. These positions represent the importance of Industry Oriented Education (IOE) amalgamation. The amalgamation of IOE and teaching practices is the fundamental strategy of an effective teaching pedagogy methodology (Ennew, 2012). This collaboration needs to be carefully planned and incorporated, and is a fundamental part of efficient industry links in an effective teaching pedagogy. This association needs to encompass fundamental issues including the Graduate's skills set, and employability as the key focus of the IOE implementation (Hunter, 2012). Figure 3 represents the relationship of the IOE and the Teaching Pedagogy, including the multiple knowledge needs.



**Figure 3: The Relationship of IOE and Teaching Pedagogy**

As it can be noticed, figure 3 has been divided into two main elements, Graduate's skills sets, and Graduate's employability. These two main elements (Graduate's skills sets and employability) are fundamental part of the relationship of IOE and teaching pedagogy. While, the successful pedagogy incorporates 'learning to do' together with the 'multiple knowledge needs' as a Graduate's employability; job acquisition and advancements are also the focal point of Graduate's skills set. In addition, the above figure too incorporates all of the other factors (which were discussed) such as workforce development in to this absolute relationship.

### **Conclusion**

All of the educational institutes are required to maintain strong industry links to preserve current and appropriate qualifications. These industry links should be attained through joint research and educational programs, which also allows students to have the opportunity to be involved in industry projects and gain important work experience.

This paper has discussed various elements of Industry Oriented Education (IOE) such as Graduate's skills set and employability as the key focus of the IOE implementation. Other elements which were discussed in detail included, job acquisition and advancements, learning on the job and employment readiness. Finally this paper also discussed the amalgamation of IOE and teaching practices which is the fundamental requirements of an effective teaching pedagogy methodology. For a teaching methodology to be valuable, this amalgamation creates the solid foundation that is obligatory.

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