University of Wollongong in Dubai - Papers   University of Wollongong in Dubai

2017

Innovative assessment strategies in higher education

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INNOVATIVE ASSESSMENT STRATEGIES IN HIGHER EDUCATION

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Abstract

Assessment is an integral part of academic practice models and by no means the easiest from a pedagogical perspective. Assessment can change the student's perception and attitudes towards learning and consequently the way in which they manage their curricular expectations and further career development. Learning outcomes indicate what is expected of students, help staff plan the delivery and provide students and employers with descriptors of the levels of knowledge and skills achieved. The challenge of any assessment method is to measure with rigour and fairness the level to which learning outcomes have been met. This communicates to students and employers, a sound mechanism for comparing the quality of the educational experience. The research aimed to design and implement an assessment model that recognises individual contributions of students within a team based on the work of the International Personality Item Pool (IPIP). The question being asked in this research was: "can the work of the International Personality Item Pool which measures Personality and Other Individual Differences be used to express an innovative, rigorous and fair assessment process of individuals and teams so that students are better prepared to develop their own careers mirroring the way individuals work in teams". The methodology proposed recognises, measures and rewards the contributions of individuals, teams and teamwork efforts associated with engineering and technology business tasks as part of a career development and employability program. The research showed that through empirical and scientific methods that the proposed principles are a sound representation of an innovative assessment model that is rigorous and fair as it is based on scientifically proven constructs by the scientific

community which enables academic practitioners to enable students career development within their academic study.

Keywords: Employability, Career Development, Lifelong Learning, Critical Thinking, The Apprentice, Student Confidence


Introduction

The Career Development and Employability (CDE) framework is an innovative academic practice concept for teaching, learning and assessment of undergraduate students' career development and employability skills within a unit of study, (Ponciano & Koh, 2016). The CDE concept is designed to provide students with knowledge and understanding of the theory and practice of project management and develop students' career skills ready for the employment markets. Project management techniques are applied to the development of engineering and technology projects. Students work in teams and develop both individual, team and business task personality traits. Alongside this, students develop their ability to think critically and with emotional intelligence coupled with behavioural interviewing techniques. The rigorous assessment of CDE is also determined by the demonstration of soft skills such as those defined by the emotional intelligence quotient, for example, critical thinking and interpersonal skills. These skills fit into the 'how to think' category and are comprehensively more challenging to assess in a student. The social context of CDE in academic practice, proposes an innovative and motivational framework for the development of students' CDE skills which is based on the reality TV show, The Apprentice ™, and was outlined in (Ponciano & Koh, 2016).

Assessments, from a student's perception, affect them in their learning life, and yet most of the students agree that they are in the dark on what goes in the minds of their examiners or assessors. As such, not having total understanding on the assessment process may affect students perception and attitudes towards the learning process, and in some cases, affect the way in which they manage their curricular expectation and further career development.It is the ability to develop a confidence in the learning outcomes that will enable a student to apply for certain careers as s/he will possess the necessary knowledge and understanding of a particular academic area.

Many Higher Education Institutions (HEI) use Outcome Based Education, (Memon, et al., 2009) (Quality Assurance Agency, 2000). The learning outcomes philosophy involves the specification of academic programmes that are compliant with, subject benchmarks, and the local HEI policies. At a lower level, learning outcomes indicate what is expected of students, help staff plan the delivery and provide students and employers with descriptors of the levels of knowledge and skills achieved. The challenge of any assessment method is to measure with rigour and fairness the level to which learning outcomes have been met. This will help students and employers to reach a common understanding on the assessment mechanism for comparison of the quality of the educational experience.

The assessment of career development and employability is also about choosing appropriate assessment techniques that will engage and motivate the students in the learning activity. However this process is of a very challenging nature (Knight, 2008). The assessment of the hard skills (IQ) is a logical process which concentrates on evaluating 'what to think' to determine if a student has acquired the necessary knowledge structures of a subject discipline. The idea of the assessment is illustrated in Figure 1.
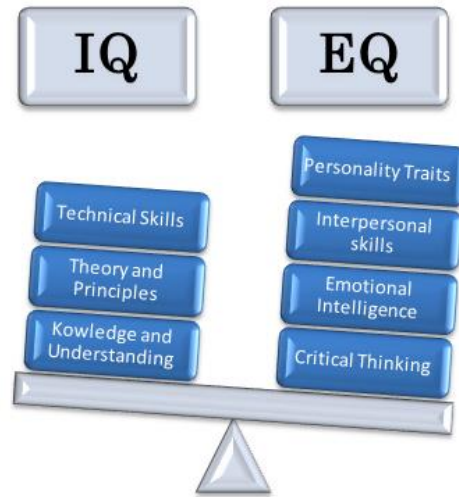
Figure 1: Employability and soft skills vs hard skills

Available literature and (Clayton, et al., 2003) propose four key models for the assessment of employability and career development summarised in the following Table 1.

*Table 1: Models for the Assessment of Employability and Career Development*

Assessment Model	Description
Inferred	Evidence of CDE skills is inferred from performance in technical subjects.
Parallel	CDE skills are taught and assessed separately.
Separate Tasks	Not only are the assessment tasks separate, they are specific to the CDE skills in question.
Integrated	Inference is drawn from across groups of subjects

While the models presented are indicative of how to go about planning assessment they are not suggestive of the techniques to employ, however, they help the academic practitioner make some early decisions on how to apply the CDE stimulus to their subject discipline.

A wealth of assessment techniques that are relevant to CDE are reported in the work of (Knight, 2001). However, in order to decide which methods are best suited to their cohorts of students, practitioners need to identify which model of employability their HEI is using – as best institutional practice can be more resource efficient; evaluate which model of employability best

matches their subject discipline or programme learning outcomes and finally which techniques will stimulate and motive students' learning.

The decision of whether to use formative or summative assessment for each technique is one that should be taken on the basis of the balance of the full assessment diet of the programme and level of study. Although summative assessment is often taken more seriously than formative, the key is to create meaningful dependencies between formative and summative assessment that will enable full engagement in assessment by the student. While routine assessment techniques, such as examinations, are best suited to asses IQ skills, because they assess knowledge and understanding, EQ skills develop slowly with the individual through a set of behaviours. As we see the shift towards a more EQ based CDE assessment practices we need to include techniques that can reflect the acquisition of skills for lifelong learning.   These techniques currently include, among others, personal development plans, portfolios and self-assessment. Figure 2 shows and overview of the CDE assessment process Philosophy.
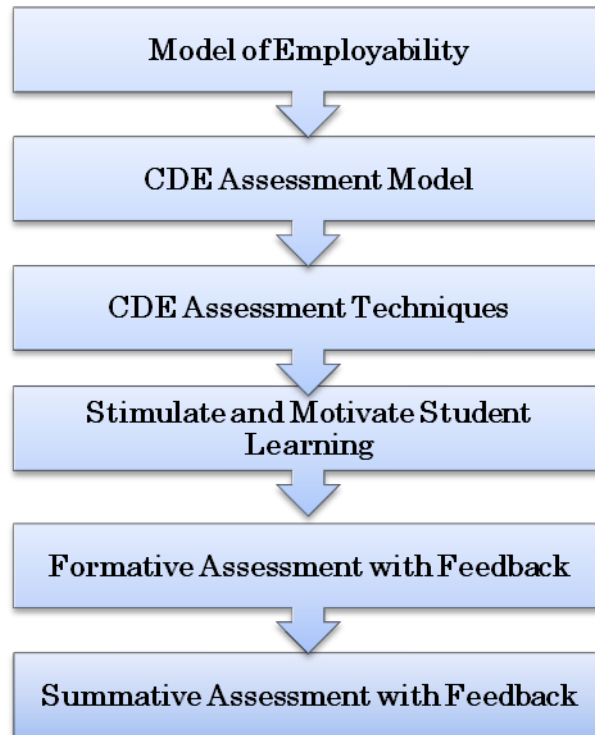
Figure 2: Overview of the CDE assessment process Philosophy

Feedback is instrumental and non-differential to the assessment of both IQ and EQ skills and independent of the mode of assessment. In Employability and Assessment (Knight, Employability and Assessment, 2001) feedback has been identified to have the following characteristics. Purposeful, that might include correction of errors, development of understanding, promotion of generic skills, development of metacognition and the maintenance of motivation. Related to the degree of achievement of the set learning outcomes, that helps learners to see the goodness of fit between judgements and their work. Timely so that students

can respond to it with the work fresh in their mind and in time to act on it before tackling another similar task. Appropriate, in relation to students' conceptions of learning, knowledge and the discourse of the discipline. Understood, to help students' development of their IQ and EQ skills.

This research work follows an innovative and motivational framework for the development of students' CDE skills based on the reality TV show, The Apprentice ™. A rigorous and fair assessment model that recognises individual and team based contributions to teamwork, based on work of the International Personality Item Pool (IPIP), is presented. The research work carried out follows an action research philosophy with ethnographic and phenomenological components. Both the CDE framework and the IPIP based assessment model study are qualitatively and quantitatively evaluated from a sample of 58 participants in the context of the student experience. The validity of the methods in academic practice and their substantial contribution is asserted to enhance the student experience by increasing student motivation and engagement as well as the open systems approach of the methods to fit with other academic subject disciplines

Assessment and Feedback

Through an analytical process of staged selection we have contracted the index of 204 labels for 269 IPIP scales into 24 personality scales and catalogued them into three categories addressing areas of development required by current career development and employability criteria. This was an empirical process based on current job and person specification trends. The CDE chosen 24 personality scales and traits are shown in Figure 2. The personality scales selected describe accurately The Individual, The Team, and The Business Task categories in the context of teaching and learning Engineering and Technology undergraduates. For every personality scale used, the IPIP item descriptors were adapted to avoid duplicate descriptors and to reflect the application within the CDE themes through the model of The Apprentice™. The descriptors of each scale are presented in terms of the positive and negative behaviour patterns by a variable number of items.

The IPIP is a scientific collaboration for the development of advanced measures of personality and other individual differences (Goldberg, et al., 2010).   Two scales, "+keyed" and "-keyed" are used, where items '+keyed' describe positive patterns of behaviour present in the category whereas items of '–keyed' describe negative patterns of behaviour or that the behaviour is not present in the personality.   For example, the Conscientiousness scale used to define individual behaviour is described synoptically in Table 2.

Table 2: IPIP Scale for Conscientiousness

+ keyed	– keyed
• Accomplish my work on time.	• Neglect my duties.
• Do things according to a plan.	• Put off unpleasant tasks.
	• Am often late to work.

Figure 3: CDE Personality Categories and Traits

## The Likert's Scale and CDE Points

The assessment process for each personality scale is via in-class observation between the individuals within a team and the facilitators. A group of three facilitators observe the identified behaviours according to the defined personality scales during the observation stages of every business task. Each facilitator specialises in a single CDE category throughout the Business Tasks.

During the Observation Sessions the facilitator, who is knowledgeable about the items that define the positive and negative tendencies of the personality scales assesses the level of propensity of the Individual, the Team or the Business Task towards a single rating on a Likert's style scale for every personality scale.

The assessment of the Business Tasks uses a scale from -2 to 2 where:
-2   =   strongly disagree to the concept
-1   =   somewhat disagree to the concept
 0   =   undecided, behaviour not evidenced
 1   =   somewhat agree to the concept
 2   =   strongly agree to the concept

The Likert's scores are converted into points for every Individual, Team and Business Task and designated as Career Development and Employability points. The maximum CDE points accrued by the three personality categories that describe the Individual, the Team and the Business Task are as follows.
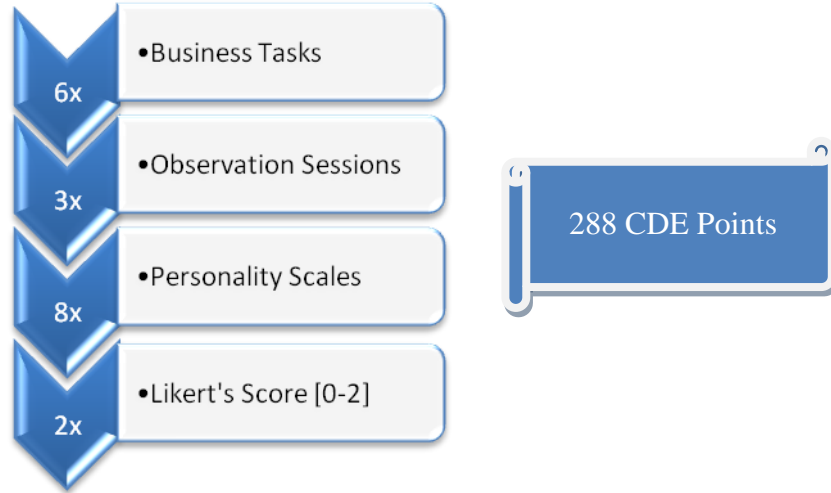
Figure 4: Method of calculating CDE points. Students Develop 6 business tasks, during 3 observation sessions, using 8 personality scales and receiving points on a Likert scale from -2 to 2.

There are 288 CDE points for each of the category; hence 864 CDE points will be collected.

Assessing the Individual

Week upon week individuals can/should improve their scores by reflecting on their behaviours of work and modifying these as appropriate to their personal and professional development. For example students can improve "reflection" by showing the '+keyed' traits: "I can demonstrate that I reconsider previous actions, events and decisions or that I am careful to collect people's opinions". The CDE points assigned to the individual category are unique for each individual in accordance with the IPIP scales used.

Assessing the Team

The personality scales used to measure the behaviour of the team are reflected as group CDE points. This means that all individuals will score the same CDE points against a particular item on the Team personality scale. We have assumed, as the team is a body of individuals that share the same goals that we can treat it as an individual body and thus talk about its personality and derivative behaviours.

The total scores associated with this category and with the Business Task category are added to show the weekly team performance and to stimulate competitiveness between teams.
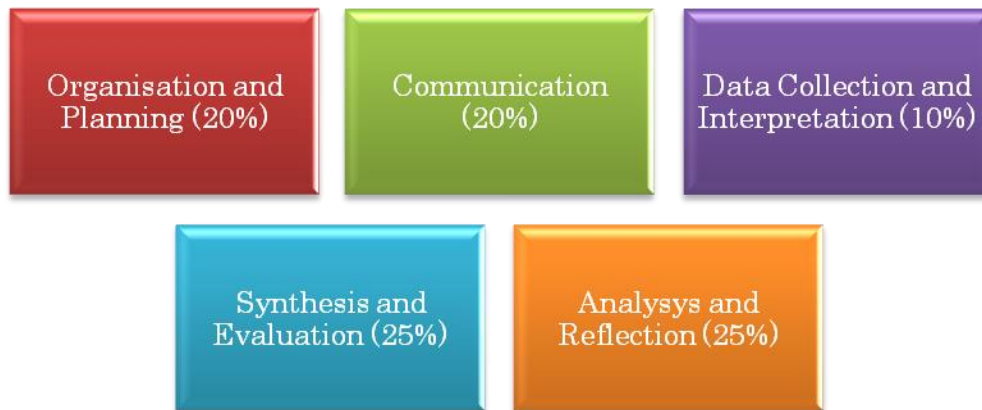
Assessing the Business Task

The assessment of a Business Tasks is identical to that explained for both the individual and the team but assigned on a team basis for every IPIP scale defined as part of the Business Task. As there is no such thing as the personality of the Business Task, what the facilitator is looking for is the levels of success in the planning and execution of the user requirements.

The personality scales have been carefully chosen to represent items that are relevant in assessing a business task. In a nutshell, as the Business Tasks are planned and executed by teams of individuals and we can talk about the personality of an individual, transitively we infer that the personality scales can be used to analyse the success of the planning and execution of a business task.

The Job application Process

The Job Application process is the first stage of the CDE model. A reality adapted job and person specification is presented to students to recreate a learning environment where students are exposed to recruitment and selection conditions. The Job Application process is defined as a summative learning activity taking place in induction week. The activity is marked using academic criteria aligned with the taxonomy of assessment domains for undergraduate level six study as shown in Figure 5. A flag indicating of short listing is also used to indicate to the student if he/she would have been shortlisted for the position had this process represented a real job application.

Organisation and Planning (20%)

Communication (20%)

Data Collection and Interpretation (10%)

Synthesis and Evaluation (25%)

Analysys and Reflection (25%)

Figure 5: Job Application Marking Criteria

The activity requires the production of four deliverables; a Covering Letter, Curriculum Vitae, an Application Form and a Job Application Statement. Each of the deliverables is aligned with current job application practices.

The Covering Letter exposes the students to the art of writing professional covering letters required by any job application process. This enables students to put into practice, writing to introduce themselves and summarising the motivation and justification for a job application

The Curriculum Vitae sub-activity enables the students to review and improve on their Curriculum Vitae to a professional level that is acceptable by the professions to which they wish to embark upon.

A job application form of the is used in the application process to help raise students awareness to the level of personal and professional detail required in standard job application forms, including an application statement.

The Application Statement is one of the most important parts of the Job Application process. Students write a statement describing how their knowledge, skills and experience meet the job specification and how their personal characteristics integrate within an organization.

A series of digital videos are presented to the students to guide them through what is currently known as best practice of the complete job application process.

Behavioural Interviews

In parallel with students work on their business tasks we introduce them to the Behavioural Interview skills technique. Behavioural Interviewing is increasingly popular with employers and is based on discovering how an individual acts in a specific employment related situation. The rational for the technique is based on the premise that the way individuals behaved to situations in the past predicts future performance. The Behavioural interview CDE training programme starts with the presentation of the technique with a digital video followed by subsequent group practice. A comprehensive list of 165 behavioural interviews questions, of which a sample is shown here, is used by students to interview each other:

- *Which is more important: creativity or efficiency? Why?*
- *What have you accomplished that shows your initiative and willingness to work?*
- *What was the toughest challenge you've ever faced?*
- *What two or three things are most important to you in your job?*
- *Give me a specific example of a time when you used good judgment and logic in solving a problem.*
- *By providing examples, convince me that you can adapt to a wide variety of people, situations and environments.*
- *Describe a time when you were faced with problems or stresses that tested your coping skills.*

This activity is formative and the facilitator gathers feedback from all groups and shares it, in class, with all students. Each group holds up to five students and two interview candidates from the group subject themselves to the process. In one of the interviewing rounds a student is asked to challenge the panel of interviewers in a formal way. This enables the interview panel to experience the difficulties that interviewers face in making the right choice of candidate.

Upon training, students are scheduled to their individual Behavioural Interview. The activity is coordinated by a panel of behavioural interviewers and takes place in 3 stages lasting a maximum of 20 minutes.

In Stage 1 the student presents a 2 minute presentation headed:

"*Solving the challenges Lecturers face in teaching students in higher education.*"

In stage 2 the interviewers will question students for a period of 15 minutes based on their job application using behavioural interviewing techniques. The interviewers aim is to ensure that students are able to demonstrate the technique and given them real preparation for a real interview. In the final stage the panel of interviewers give the student verbal feedback.

The behavioural interview is summatively assessed using the criteria proposed by the job specification as shown Figure 6.

Figure 6: Behavioural Interview Marking Criteria

The taxonomy of assessment domains addressed by the behavioural interview activity are:

|	
Technical Skills	Data Collection and Interpretation
Organisation and Planning	Analysis and Critical Reflexion
Communication	Synthesis and Evaluation

Feedback to Students

In CDE student feedback is designed to encourage participation and the development of technical Engineering and Technology knowledge and skills. The Observation Sessions via the academic facilitator is significant examples of the importance of feedback in CDE. CDE also provides the student with qualitative and quantitative written feedback from a variety of sources, which includes the facilitator.

Every piece of summative work receives written feedback relating to the different marking criteria and a mark in a percentage scale. The Pitch and Boardroom guests' reports are available to all students for consultation. Individuals and Teams are advised to read and reflect on this feedback and to use it throughout the development of subsequent Business Tasks and in the successful individual achievement of the Personal Development Plans (PDP) and critical review assessment.

A final and original way in which the CDE framework provides students with prompt and weekly feedback which stimulates competitiveness through their studies is via the dissemination of charts and reports of indicative performance for individuals and teams. The graphical

feedback provided at the end of every Observation Session is based on the CDE personality scores achieved by Individuals, Teams and the work on the Business Task. At the end of every task students are also sent their personality scales individual feedback. Figure 7 shows an example of the CDE scores achieved by every team at the end of a three week observation cycle. This information stimulates team motivation and competitiveness as teams try to win the task prize.
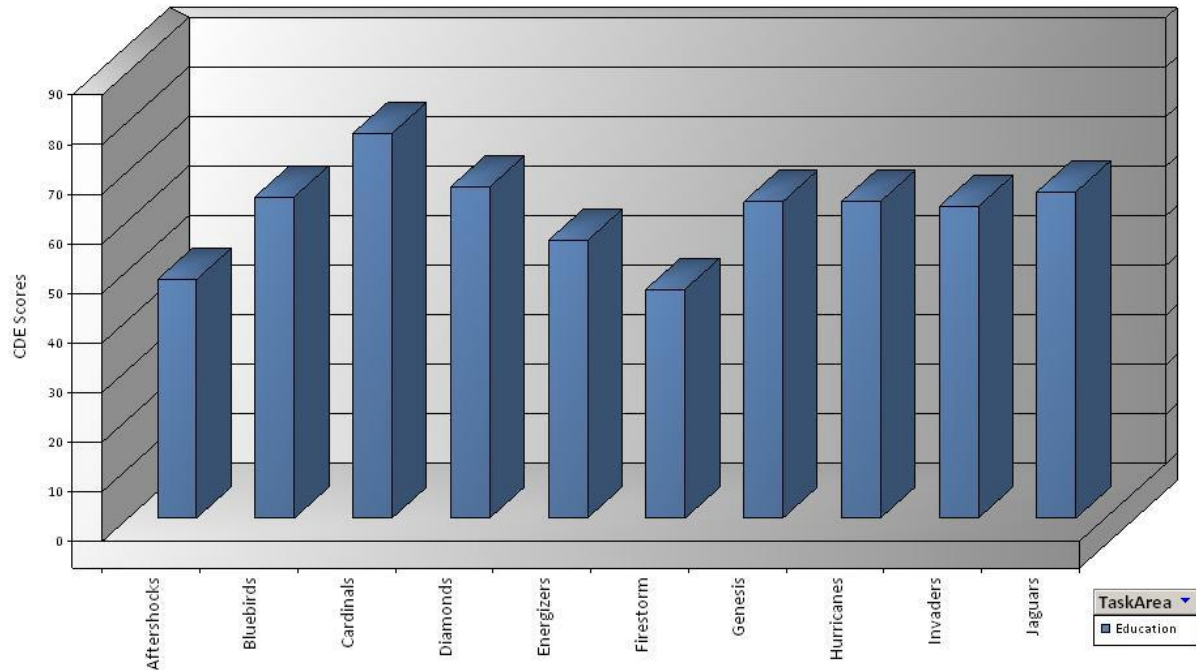
Figure 7: Team Competitiveness chart (Teams names are shown in the x-axis)

The breakdown of the composite CDE score for a particular task is provided against all Team and Business Task personality scales as indicated in Figure 8. This chart provides the student with valuable weekly information of the personality scales scores defined for both the team and the business task. At the end of every week students should reflect on their scores and remind themselves of the personality scale definition in order to improve their scores.

At the end of every task students receive an individual breakdown of their individual personality scales scores. This indicates to the individual student the areas of personality which they must develop over the course of the study. This information is to be reviewed in conjunction with the definitions of the personality scales.
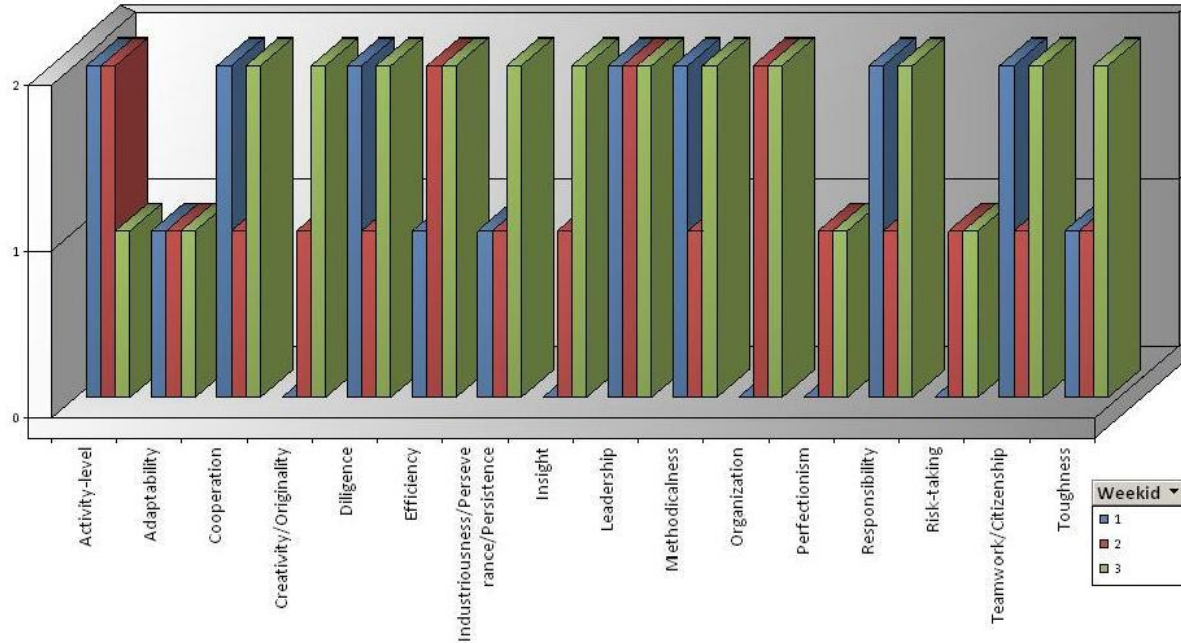
Figure 8: Education Task IPIP CDE Team Scores for team Bluebirds

Conclusion

This study has presented an innovative scheme for the assessment of students which does not focus directly on the outcomes of their work from a course perspective but instead highlights an approach which is based on the set of attitudes towards developing professional work practices. The method presented is about developing the right behaviours to work in professional practice and the need for the cohesive work in teams to improve the productivity of teams in a work environment. CDE focus on the wholistic process that starts with a job application and finishes with an employee developing the self and his soft skills while putting into practice technical skills learnt during an engineering and technology course.

The proposed assessment strategies were described by students as original and commended on the fact that feedback was given at the end of every week of work and in a visual way. The prompt feedback given by this assessment scheme allowed students to make noticeable improvements to their marks on subsequent project assessments within the module of study as they better understood the necessary attributes of employability and project work within a team.

References

Clayton, B., Blom, K., Meyers, D. & Bateman, A., (2003). *Assessing and Certifying Generic Skills.* St. Adelaide: Australian National Training Authority, National Centre for Vocational Education Research..

Knight, P., (2001). *Employability and Assessment.* Lancaster: Lancaster University.