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Changing the Assessment To Promote Deeper Learning

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Abstract

The Dublin Institute of Technology is one of the largest multi-level higher education providers in Ireland. The Institute's traditional mission has always been focused on teaching and learning in the field of advanced technical vocational education and training (TVET), and one of its agendas is to foster and encourage changes in teaching practice and methodology in order to enhance the student learning experience.

This paper is a result of the ever changing process which shows the evolution of the assessment process to its current format. It was driven by the fact that we as lecturers realised that the assessments promoted surface learning. Earlier assessments did not allow for a demonstration of knowledge but instead relied purely on memory recall. Topics were so vast and assessment questions so specific; this led to students having to memorise everything.

The questions we asked ourselves were: By giving students exam papers and asking them to recall facts and information, are we really just testing their memory? How do we know what they have learned and more importantly do they understand what they have learned?

A change was needed to promote deeper learning and to give students a better understanding of each topic. The students have to be given the opportunity to demonstrate their acquired knowledge. As external providers of a prescribed curriculum, its content was beyond our remit, so instead we had to focus on the assessment process.

Our remit: To carry out research as to whether 'changing the assessment would promote deeper learning'. Research was carried out, focusing on groups of Apprentices in Cabinet-Making, in the final stages of their apprenticeship. The study was conducted over a number of years and primarily focused on the theory assessments. By acting upon my research findings, I was able to change the layout of the theory paper to promote deeper learning.

Keywords: Assessments, Memory Recall, Knowledge, Understanding.

1 INTRODUCTION

The apprenticeship system in Ireland is governed by an external authority. It is based on "a standard-based" model whereby apprentices must reach a certain standard as laid down by that authority in order to continue with their training and qualify in their chosen trade.

Apprenticeship training consists of seven phases, both on-the-job with employer and off-the-job with a Training Centre or Educational College. Phase 1 (on-the-job): is a basic introduction to apprenticeship, with emphasis on safe work practices, working in industry and the basic skills of their chosen trade.

Phase 2, 4 and 6 (off-the-job): gives the apprentice the opportunity to get full-time skills training and related education, and also brings all the apprentices onto a level footing by getting training in areas that they might not get in their various employments.

Phases 3, 5 and 7 (on-the-job): gives the apprentice the chance to improve and further develop the skills learned in the off-the-job phases by putting them into real life practice and experiences.

1.1 Background

The current apprenticeship curriculum and assessment methods are controlled by the external authority. DIT provides the service whereby, the apprentices are taught, according to and within the controls of the external authority. With such a predefined and at times outdated curriculum it is hard to keep students engaged. We as lecturers find ourselves teaching the students material that they will probably never use and yet they will be assessed on. Instead of lecturers teaching outdated methods and material use we should be keeping students up to date on new methods and innovative materials which we see as being of more benefit to them. The problem arises when the students realise that they will not be assessed on this new material. So while being of more benefit to them, they do not need it for the test and question why they are learning it.

While there have been periods of curriculum review and new material has been added nothing ever gets taken out. This is very similar to the type of curriculum highlighted in 'The Sabre Tooth curriculum' by J.Abrer Peddiwell (1939) [1] because there are many topics included under the heading 'they have always been taught so why leave them out'. The ever increasing volume of topics results in making the syllabus very difficult to teach to any great depth. In my research I have found this view expressed by many.

> On many apprentice courses the syllabus could be described as being 'a mile wide and an inch deep'. Finding time to cover the syllabus in an interactive and facilitative way may be difficult. (Sneyd, 2004) [2]

1.2 Surface Learning

Surface learning occurs because there are too many topics being taught, and with some topics, the breadth of the subject is just too wide to cover it in any depth. Ensuring that all topics are covered becomes more important than ensuring that the students understand them. Gardner sums this point up;

> The greatest enemy of understanding is coverage – I can't repeat that often enough. If you're determined to cover a lot of things, you are guaranteeing that most kids will not understand, because they haven't had time enough to go into things in depth, to figure out what the requisite understanding is, and be able to perform that understanding in different situations. (Gardner 1993, as cited in Biggs & Tang, 2007, pg 40) [3]

These students are only subjected to summative testing and rarely get summative feedback. The only formative feedback these students receive is if the lecturers in question decide to address this problem themselves. The earlier types of summative assessment encouraged a surface approach to learning as the students tended to memorise what they thought would be asked in the test. This was a fault of the module having too much content, which in turn then forced the teachers to spend more time on covering the content rather than expanding on the students' depth of knowledge. Another fault was that the assessment paper only assessed the surface learning or memory recall of the students. It did not give the students the opportunity to declare what knowledge that they had gained.

1.3 Assessing memory recall or knowledge

Students were aware that past papers only assessed memory recall so the students spent most of their time trying to memorise everything instead of spending time trying to understand. This in turn led to students having a surface approach to learning.

If the assessment is designed to explore what knowledge the students have gained rather than trying to catch them out on what they have forgotten, then students will engage better and perform well in their exams. I believe that changing and using an improved method of assessment can have a better impact on the students than they way we teach them. Others have conducted research into how assessments relate to learning.

Black & Williams conducted research into how assessment drives the learning. Through their research into assessments they concluded that knowing how you are going to be assessed can influence your learning up to twenty percent in the difference.

Authors such as Biggs 2002, [4] 2003 [5]; Biggs & Tang 2007 [3]; MacFarlene 2004 [6]; Brown & Knight 1994 [7] and Black & Williams 2001 [8] believe that assessments shape the way we learn. Brown & Knight 1994 make some valid points regarding assessment;

- Students are motivated by assessment: students study and learn towards their exams and tend to only concentrate on what will be assessed in the exams.
- Assessment is learning: It is inconceivable not to assess a students learning.

(Brown & Knight, 1994 pg 33) [7]

Having changed the layout of the assessment papers, I now use past papers as a learning and teaching aid. By getting the students to complete the questions on past papers, correcting the answers and providing formative feedback, the students learn to answer the questions correctly. The students are often presented with past paper questions on topics not yet covered and are expected to research the answers to these questions on their own. This task promotes self directed learning and encourages deep learning, which was previously unheard of with similar past students.

2 FAIRNESS

I spent many years trying to turn the assessment papers for Phase 6 Cabinetmaking from a surface type assessment to one which tests the knowledge that the student has gained rather than what they can remember on the day. I have always been restricted with marking criteria of 'Correct or Incorrect' for each question. The 'External Authority' have never used percentages and although have been asked for years to change this unfair marking scheme, they have stuck with it regardless.

Students were expected to recall all information given to them in order to pass the theory paper. Phase six students have to get seventeen out of twenty correct (85%) for a credit or fourteen out of twenty correct (70%) for a pass. These percentages are quite high when compared to other modules across the colleges, that require forty percent to achieve a pass in each module.

Another major part of the criterion is that all of the model answer must be correct in order to get a correct mark for each question, which in turn means that the student did not receive any marks for having a large percentage of the question correct. The student had to get all of the answer correct in order to achieve full marks. For example a question awarded one mark for getting all five required elements correct and nothing if only four were correct.

3 EARLIER ASSESSMENT THEORY PAPERS

The earlier theory papers for Cabinet-Making appeared to be flawed as they did not give a fair representation of the learner's abilities, as witnessed by lecturers' firsthand. The very first 'Theory Assessment' was a prime example of this, whereby a very high percentage of a class failed to reach a pass level simply because they did not have "word for word" the model answer provided. An assessment forum was called and the flaws in the paper were highlighted, the major one being, expecting a student to get a "word for word" model answer correct. Apart from the fact that we deemed some of the model answers incorrect to begin with, there was also an issue with the way some of the questions were asked which could have been misleading, which of course would also deviate away from the model answer.

The external authority refused to change the marking criteria to a percentage type paper. The lecturers involved “proved” this method to be fairer when we used it as an alternative in marking the first theory paper, where nearly everybody failed, as it gave a fairer representation of the class’s abilities with results ranging from pass to credits.

The actual percentage of questions that the student has to get correct in order to pass is quite high at seventy percent. The external authority governing apprentice cabinet-makers have refused over the years to lower this pass rate which means that the only option left was to try and change the layout of how the questions would be asked.

These views are echoed by Race & Pickford.

> .....too often assessment is not ‘fit for purpose’. Too often, the actual assessment processes and instruments which we use cannot be considered the most sensible ways to measure students’ achievement of the intended learning outcomes of their programmes. Too often, historical precedents continue to influence our design of assessment. For example time-constrained, unseen, written examinations only manage to measure a shadow of students’ actual learning, as filtered through their pen-and-paper communication in exam rooms. (Race & Pickford, 2007, pg 113) [9]

3.1 Assessments: What did they assess

We as lecturers are not permitted to keep personal data on our students, we correct and correlate the assessment results and forward them onto the external authority, and as a result I cannot supply statistics for my students.

We realised that the assessment results did not reflect the students’ abilities, with many bright intelligent students failing exams, as the assessment at the time didn’t allow for a demonstration of knowledge but instead relied purely on memory recall. The questions we asked ourselves were:

By giving students exam papers and asking them to recall facts and information:

> Are we really just testing their memory?
>
> How do we know what they have learned?
>
> Do they understand what they have learned?

Having studied the student’s answers in their theory assessments and I came to the conclusion that the questions and model answers were very specific. This meant that they could only be answered by memory recall. The students were not been given a chance to show their knowledge.

3.2 Changing the assessments

Still keeping within the restrictions I started making changes to the layout of a couple of questions. For example to overcome the problem of all or nothing marking I split a number of the questions into four parts. In the model answer I then requested that to achieve the full mark the student had to get three out of the four parts correct thus enabling me to award a mark for the student getting seventy-five percent of the question correct. Thus the student received recognition for his/her answer where as in a previous paper they wouldn’t have received any marks.

This style of questioning enabled me to access the learner’s depth of knowledge, because instead of asking one question on a topic, I was splitting that topic up into three or four parts, thus giving the students the opportunity to show how much they knew about this topic.

3.2.1 Example of earlier type of question

Name four Asian hardwoods.

The module on trees is also a large topic - this question promotes surface learning and only assesses if the student can recall the names of trees from one area in the whole world. By asking a question to cover a larger area of this vast topic and also including a choice, students were given a better chance at expressing their knowledge.

3.2.2 Example of revised question

Answer any two of the following questions in relation to Trees:

1 Name four home-grown hardwood trees.

2 How would you identify a softwood tree.

3 Name four tropical hardwood trees.

This question covers more than just one area of this topic and allows the student to choose which questions to answer.

3.3 Knowledge of topic

The topics can be at times very large for example “History of Furniture” the learning outcome for the learner is stated as “history outlined correctly” for the following:

The history of furniture from the year 1450 to the year 1850

Outline the age of the “Designer Period” in furniture history from 1745 to 1806

Outline the history of furniture from the year 1800 to present

This huge area is assessed using two questions, approximately eight minutes each. The time dedicated to teaching this topic in class would be up to six hours. Lectures have to decide what they think is relevant for the students’ to learn. As this area is so vast, we find that lectures across the many institutes would put different emphasis on different designers, so at times, questions would arise on designers that were not even covered in class.

3.3.1 Example of an earlier type of question.

Michael Thonnet was famous for a certain type of furniture making. Tell what you know of this man and his work.

This question promotes surface learning and again only assesses recall, it also depends on whether the student studied this individual.

3.3.2 Examples of revised question types

By asking a question to cover a larger area of this vast topic and also including a choice, the students can showcase what they have learned by drawing many different designs for any of the given designers or items listed.

Example 1 Make a neat pictorial sketch of a chair designed by one of the following designers:

- Rennie Mackintosh
- William Morris & Co.
- Michael Thonnet

Example 2 Make a neat pictorial sketch of a one of the following items.

- Rent table
- Breakfront bookcase
- Throne chair

3.4 Tables

I found that using tables was a fairer method of examining topics that had a broad range of knowledge within them. It seemed unfair to concentrate on a particular area of that topic when the fairer option would be, to expand the question to cover as much of that topic as possible. This assesses the broad range of knowledge of this topic.

Referring back to the earlier question given in example 3.2.1 that assesses the student's knowledge on one individual, I found that a fairer question to assess this area would be using a table and requesting that students match the names of the given designers with those items listed in the table below. This question covers the broader spectrum of this topic. (see Table 1)

3.4.1 Example 1 of revised question using tables

From the list of designers given, match each designer to each item of furniture in the table below, each designer matches only one item.

Eileen Gray
Thomas Sheraton
Thomas Chippendale
Aero Aarnio
Michael Thonnet
George Hepplewhite
Philip Webb

Table 1

Lyre Games Table	
Ball & Claw Cabriole Leg	
Bent wood Furniture	
Bibenddum Chair	
Gothic Style Bookcase	
Bubble chair	
Shield Back Chair	

3.4.2 Example 2 of revised question using tables

For this question students were expected to put the different examples of manufactured board under the correct heading, showing that they could identify the material composition of each board. (see Table 2 below)

Identify correctly the material composition of each of the manufactured boards in the table below by placing a tick √ in the appropriate box.

Table 2

Boards	Core Board	Particle Board	Fibre board
Peg board			

Flexi ply			
MDF			
Lamin board			
Batten board			
Stout core ply			
Chipboard			
Hard board			
Oriented strand board			
Marine ply			

3.5 Problem based learning (PBL)

Students love questions on problem solving and by asking questions with the words, " What would you use and give reasons for your choice" it again lets the students show their depth and breadth of knowledge by thinking about what they would do and their reasons for carrying out their actions. It motivates them into thinking about problems and how to solve them. Sometimes these students need to be motivated by thinking, as Edward De Bono says 'Because thinking is a skill that can be learned, practised and developed. But you have to want to develop that skill' (De Bono, 1995) [10]

These types of questions give the students a chance to declare their knowledge, as Black and William highlight students should be given a chance to express their understanding in learning so why not in the assessment too. "Opportunities for pupils to express their understanding should be designed into any piece of teaching, for this will initiate the interaction whereby formative assessment aids learning ". (Black & William, 2001, pg 7) [8]

3.5.1 Example 1 of PBL question

Choose one of the finishes (from two or three) and describe how you would apply it.

This question gives the student a choice as to which part of the question he/she wishes to answer. This style of question also allows the student to show their depth of knowledge, as they would have to rely on their practical experiences as well as their knowledge of finishes to give a good answer in response to this question.

3.5.2 Example 2 of PBL question

Suggest a suitable finish for each of the following, and give one reason for each choice:

a) A solid walnut kitchen worktop

b) Wardrobe doors

c) A solid oak floor

Students would also be expected to give a valid reason for their choice of finish. Each item requires a special type of finish, therefore personal experience of finishes is being assessed in both example questions 1 & 2.

3.5.3 Example 3 of PBL question

This PBL question asks the students to showcase their knowledge in carrying out simple repairs to different items.

Pick any three of the following. Give a brief description of how each of these repairs should be carried out on antique furniture.

a) A loose joint with a damaged tennon

b) A split saddle seat on a chair

c) A broken club foot (front of toe is missing)

d) A few worm holes in a table leg (damage left by furniture beetles)

PBL allows the student to apply what they have learned to different situations. In order to carry out this task and solve these questions, the student needs to develop a deeper understanding of the subject matter. Biggs & Tang are great promoters of problem based learning, as are many others.

> "They (students) may have less declarative knowledge, but use what they have to reason more effectively and to apply the products of their reasoning; they have greater self-awareness and self direction; and they enjoy learning more, as indeed do their teachers" (Biggs & Tang, 2007, pg 160) [3]

Biggs, 2003 [4]; Brown & Knight 1994 [7] both talk about types of learning and understandably promote the deeper approach to learning as illustrated by Brown & Knight below.

> 'Surface' learning is seen as relatively passive. 'Deep' learning, on the other hand, involves a quest for understanding and involves an interaction with the new information, which is substantially reworked in the learning process. It has been said that this information will then be better remembered and that the learner will be more able to use and apply it, to evaluate its strengths and weaknesses and to see directions for further learning. (Brown & Knight, 1994. Pg 30) [7]

4 CONCLUSION

By manipulating and changing the theory assessment paper this way, I was able to engage the students in a deeper approach to learning. The students realised that they need to understand each topic more, rather than just remembering parts that might come up in a test. The students could see the link between what they were learning in class and what they were expected to know for their assessments. As Cambridge puts it "If students see the direct learning benefit of an assessment, they are more likely to put forth their best effort in engaging with it". (Cambridge, (2010) pg 88) [11]

As a direct result of the assessment change, the students spent less time trying to memorise everything and more time understanding.

The students welcomed the formative feedback that they received through participating in each past assessment. Completing assessments in their own time and correcting them during class time, became part of their learning. The students stayed engaged during class time and asked more questions as a result. "There is a close relationship between learning and assessments contexts. In other words, assessment is embedded naturally in learning. This makes assessment more natural for the learner". (Gagné, Wagner et. el. 2005, Pg 266) [12]

Result: Changing the assessment promoted learning and understanding thus enhancing the student's learning experience to promote deeper learning.

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