Conference papers   Dublin School of Architecture (Former DIT)

2012-08-30

A JOURNEY THROUGH ASSESSMENT: FROM MEMORY RECOLLECTION TO KNOWLEDGE DEMONSTRATION

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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 assessment results did not reflect the learners' abilities, with many bright intelligent learners 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 learners exam papers and asking them to recall facts and information, are we really giving them a fair assessment;- does it reflect what they have learned, or is it just testing their memory?

A change was needed to needed to allow this fairer reflection of student ability. 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 I had to focus on the assessment process.

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.

Keywords: Fairness, Assessments, Knowledge Understanding, Memory Recall.

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. At times this can prove difficult as the curriculum is predefined and sometimes appears outdated. This results in lecturers teaching outdated methods and material use, as well as keeping learners up to date on new methods and innovative materials which we see as being of more benefit to them. This approach could be compared to the type of curriculum described in 'The Sabre Tooth curriculum' by J.Abrer Peddiwell (1939) as most definitely there are many topics included under the heading 'they have always been taught so why leave them out'.

1.2   Surface Learning

With too many topics being taught, and students not knowing which ones are of more importance they can become overloaded and this may result in the student taking down or highlighting areas or points from each topic instead of taking the time to understand each topic. 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, p. 40)

The huge amount of topics in turn promotes surface learning. The problem then arises in that the learner will only be assessed on the given curriculum which means that we have to devote more time to teaching outdated topics and focus more on teaching them how to pass their exams. Instead we should be promoting a greater depth of knowledge which will give them a better start to working life. Only their surface learning is tested as Biggs states "Students learn what they think they will be tested on. This is backwash, when assessment determines what and how students learn more than the curriculum does". (Biggs, 2003, p. 140)

1.3 Assessing memory recall or knowledge

Assessment shapes the way we learn. Authors such as Biggs 2002, 2003; Biggs & Tang 2007; MacFarlene 2004; Brown & Knight 1994 and Black & Williams 2001 have similar beliefs. 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, p. 33)

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.

In my own practice, I have witnessed for years the apprentice standards based assessments resulting in students having a surface approach to learning, indicating that the method of assessment we use can have a better impact on the students than they way we teach them. If the assessment is designed to explore what knowledge the students have gained rather than trying to catch what they have forgotten, then students might engage better and do better in their exams.

Some types of summative assessments can encourage a surface approach to learning as the students tend to memorise what they think will be asked on the test. This can be the fault of the module having too much content, which then forces the teachers to spend more time on covering the content rather than expanding on the students' depth of knowledge. Another fault is the assessment paper that only assesses the surface learning or memory recall of the 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, which 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.

Race & Pickford concur when they state;-

> .....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, p. 113)

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 giving them a fair assessment?

Does it reflect what they have learned?

Are we really just testing their memory?

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

After a few early theory paper fiascos I was asked by the external authority in charge if I would deliver the assessments for cabinet-making. I was then in the unique position of having to deliver the curriculum to the learners while also being able to create and change the assessments within certain constraints to reflect the actual capabilities of the learners that we taught in our school. This took a number of papers because I could really only make a few changes at a time with each paper otherwise the complete layout would have changed dramatically, and as stated previously the external authority were not prepared to let that happen.

3.3   Duration

The first change I made was to give the learners the maximum time allowed for their theory exam so I brought the time allowed up to 3 hours from 2 or 2.5hrs, and went about setting questions whereby the learner could express themselves. The extra time allowed the learners a chance to breathe, take stock of what they were being asked to do and allowed them to elaborate more on the answers or be more creative with their sketches and drawings.

3.4   Knowledge of Topic

Still keeping within the restrictions of twenty questions, 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. Therefore 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.

3.4.1   *Example of earlier type of question*

Name four Asian hardwoods.

The module on trees is 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.

3.4.2   *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.

3.5   Choice

By giving a question whereby the learner is given a choice as to which part of the question he/she wishes to answer.

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

This type of question gives the learner a number of options as firstly I wasn't dictating to the learner that he/she had to describe the application of one particular finish but also by asking how they would apply it allowed the learner to think and describe from actual experience how they would apply the different finishes. This would 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.

This type of question gives the learner a chance to show 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 & Wiliam, 2001, p. 7)

3.6   Knowledge of large 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.

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.

3.6.2   *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

3.7   Sketching

Learners are encouraged to express themselves by sketching a wide range of items from hand tools to fittings and furniture. In the real working environment when clients ask these cabinet-makers to create some item of furniture for them, the first thing that the client would want to see is a sketch or drawing of what the finished article would be. So we as teachers would see this skill as essential to their learning, but it is not readily taught because it is not assessed on its own.

Sketching as a communication tool, can go a long way in helping to achieve full marks. So when asking a question about where certain items would be found I always include the words, "sketches can be used to support your answer".

3.8   Visual

Early assessments were written using plain text and learners were given a number of lines on which to write their answers. This in itself can be quite boring and non stimulus for learners taking the test. I tried to break the monotony of text and lines by giving drawings of sections through items and getting learners to name the parts. In some questions I removed the lines and asked the learners to draw or sketch the answer instead.

I introduced some questions whereby the learners had to identify pictures and provide more information on each item. The learners were able to demonstrate the knowledge that they

knew about each item rather than been asked to recall its name only. Marks were awarded for correctly naming two out of three or three out of four correctly.

This might be considered a memory recall type of question, but I found that as they just had to write the name of the item under the picture, that they were able to come back to this question as many times as they needed throughout the whole assessment. Also this is a question that can be answered very quickly and the extra time not used by this type of question could be used in answering a more detailed or sketching question.

3.9   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 3.6.1 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)

3.9.1   *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	

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			

3.10 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, De Bono would argue 'Because thinking is a skill that can be learned, practised and developed. But you have to want to develop that skill' (De Bono, 1995)

PBL questions give the students a chance to declare their knowledge, Black and William would suggest 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, p. 7)

I introduced some small PBL type questions, for example I would list some items of furniture or surfaces and ask the students to tell me what glue or finish that they would use on each of these and their reasons for their choice. I would get some really good intelligent answers whereas in prior assessment papers if they were asked to list some natural or synthetic glues or finishes they would struggle to remember the correct names.

3.10.1   *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.

3.10.2   *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.

3.10.3   *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 (2007) are great promoters of problem based learning, they believe that students taught by problem based learning think differently from those taught by traditional methods.

> "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, p. 160)

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 learners realised that they should understand each topic more, rather than just remembering parts that might come up in a test. The learners could see the link between what they were learning in class and what they were expected to know for their assessments. They spent less time trying to memorise everything and more time understanding. "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, p. 266)

Biggs, 2003; Brown & Knight, 1994 both discuss different 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. P. 30)

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

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