INTEGRATING WORKSHOP EXERCISES WITH CLASS BASED LEARNING IN AN EFFORT TO PROMOTE UNDERSTANDING

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Abstract
A standards based craft apprenticeship in Ireland is characterised by block phases of both on the job and off the job training. Typically phases 2, 4 and 6 are off the job training and occur in a training board and an Institute of Technology. Phase 6 is the penultimate phase and incorporates theory and practical examinations. An analysis of the Phase 6 theory paper indicated a consistent pattern of poor results regarding the screen printing unit. Over a three-year period 75% of the exam questions were answered incorrectly. This was a cause for concern in an exam compromising of 30 questions and where the threshold for achieving a pass was set at 70%. This meant 21 questions need to be answered correctly where typically three questions were asked about screen printing. In an effort to engage the apprentices in a more conceptual understanding of the material the lecture format was changed. The learning unit was moved from the classroom into a workshop in an effort to engage the apprentices in an interchange of information rather than simply a delivery of information. Preliminary results are positive with an improvement in the results for the unit.

Keywords: Standards based craft apprenticeship; lecture format.

1 INTRODUCTION
This paper will explore a different approach to the teaching of a particular module – screen printing – on the Phase 6 of the Irish Standards Based Apprenticeship programme. The Irish Standards Based Apprenticeship is accredited by Solas who are the ‘Irish state organisation with responsibility for the funding, planning and co-ordination Further Education and Training in Ireland’ [1]. The Irish craft Standards Based Apprenticeship involves the completion of seven phases that are divided among block release periods alternated with on the job training provided by the employer. As the programme is a standards based one it means that throughout all phases there are assessments that have to be undertaken by the apprentice.

Phases 1, 3, 5 and 7 are work based and the assessments are delivered by the employer. Phase 2 is a twenty week block off the job training in an Education and Training Board (ETB) and usually focusses on the introductory tasks associated with the early stages of an apprenticeship. Phases 4 and 6 are both 10 week blocks delivered by an Institute of Technology (IT). An IT is an institute of higher education that delivers programmes from Level 6 (undergraduate) to Level 10 (post graduate) and also delivers advanced modules as part of multiple apprenticeship programmes in the Republic of Ireland.

Both authors deliver Phases 4 and 6 to apprentice painters and decorators. This short paper will focus on a module delivered in Phase 6. Phase 6 is a ten week block and is the penultimate phase of the apprenticeship. As such there is usually additional pressure on the apprentices as they are coming to the end of their apprenticeship and the stakes with regards to assessment are high. A fail at this point could stop their apprenticeship for anything from 3 months to 9 months. This is because of the amount of time required to organise a repeat assessment. It is also fair to say that the ten weeks allocated for Phase 6 is restrictive and pressurised as much material must be covered. In the ten week phase there are a total of six assessments that have to be carried out. Four are practical and one is a technical drawing exam and the last is a theory test comprising thirty short answer questions which must be answered in three hours.

The phase six theory test takes place in week ten. The three hour test comprises of thirty short answer questions covering thirteen separate theory modules. The pass mark was set at 70% meaning that 21 questions had to be answered correctly to pass and 26 to achieve a credit. In addition there is a three hour technical drawing test and four practical tests which vary in time from 4 to 7 hours. This curriculum and exam is set by Solas and we are effectively service providers to Solas. This means...
that we are contracted to deliver the curriculum and assessments they have already set and as such the institutes and indeed the lecturers have no control over it. This paper will focus on issues that arose with the Phase 6 theory test paper.

2 A PROBLEM IDENTIFIED

As mentioned previously there are thirteen theory modules in the Phase 6 block release. This paper will focus on a problem that was identified in the screen printing module. To begin a short background on screen printing will be provided.

Screen printing is the process of forcing ink, by pressing on a squeegee, through a mesh or netting on a screen onto the object being printed. The screen is made of various materials such as silk, organdie or steel and this screen is suspended in a wooden or steel frame. The non-printing areas of the screen are protected by the stencil. Once a screen is created it enables fast and accurate repeat prints to be made and through the use of a variety of inks there are many different types of substrates that can be screen printed. For example, glass, fascia signs and clothes can all be screen printed. In a sense the screen printing predates modern desktop computers.

Over the last number of years the painting and decorating curriculum had changed. Originally the screen printing module had a significant practical element where apprentices had to create their own screen and then screen print various objects. Apprentices were required to design and draw and then cut their stencils and apply them to a screen. This provided a very strong link between the practical elements and the theory elements of the same module as both elements were run concurrently. As the curriculum has changed and indeed printing technology has changed also there is less need for painters and decorators to utilise screen printing. As such, the screen printing machinery that was in use is no longer available for use. While the practical element of screen printing is in evidence much less the theory element has continued to be part of the curriculum. This is an issue that we are actively trying to address with Solas.

As part of our own self professional development we decided to analyse previous results of the Phase 6 papers to identify any areas that apprentices were consistently falling short in and through that perhaps identify areas where we were falling short also. An analysis of the answer papers over a three year period showed a consistent trend in apprentices answering the questions on the screen printing module incorrectly. Typically, three questions on screen printing were asked in each exam and over the three year analysis it could be seen that 75% of the questions on screen printing were answered incorrectly – see Table 1. Following discussions among the authors and reviewing relevant literature it was decided to change the format of the lecture dealing with screen printing in an effort to foster and encourage a more conceptual understanding of the module.

3 CHANGING THE LECTURE

It is a concern with us both that the Phase 6 short answer theory test drives a surface approach to learning. Marton and Saljo [2] classify two different levels of learning processing as surface level processing and deep level processing. Smith and Colby [3] indicate a surface approach to learning as a process that involves a minimum interaction with the task, a focus on memorisation and procedures that do not consist of reflection. The time limit of the course means that there is no time for reflection and memorisation is a requirement due to the newness of the content being covered. Screen printing is not covered or even mentioned at any time before the Phase 6 block release and it is fair to say the in industry there are virtually no painting and decorating contractors carrying out screen printing. The questions on the test are short answer questions and are quite specific leaving no room for conceptual answers. Surface learning is also indicated by an intention to achieve a bare pass (ibid). From our analysis it appeared that the apprentices were not even engaging at a surface level with the screen printing material.

In an effort to change the lecture from a delivery mode to a more interactive mode the lecture was moved into the workshop. It has been argued that being active is better than being inactive when learning is taking place [4] [5]. The workshop is where the hands-on work is carried out and both authors noted the difference in approach from the apprentices when in the workshop. As the workshop reflected the workplace more accurately than the classroom it could be seen that apprentices preferred the tasks carried out in the workshops. Indeed the quantity of written material to be covered in the classroom often proved daunting for our craft apprentices many of whom had opted for an apprenticeship as a means of exiting the formal school system. The setting in the workshop also
primed the apprentices to expect more active learning as they rarely had time to be idle once workshop activities began.

A table was laid out with all the components that constitute the screen printing process. This included various meshes and both timber frames and steel frames for the screens. Inks and various tools were also laid out as well as old screens that were found in a store room. Completed screen printed posters were also laid out. All of the components were listed on a flip chart as well as key terms from the theory notes. The list was written very randomly to assign no greater importance to any one item. The apprentices were told that all the materials and tools on the table would enable a screen to be drawn and then printed. They were encouraged to handle and in particular smell the inks as different solvent-based inks were extremely pungent. On a portable whiteboard in the workshop were three headings – manufacture, tools, process. Each item on the table was then explained in a broad manner while the apprentices stood around. The absence of anywhere to sit was deliberate to avoid any long periods of low level activity which has been linked to diminishing of the learning and also to attention decrement [4].

The apprentices were split into pairs, given writing materials and asked the following questions:

1. How is a screen made?
2. What tools are used to make a screen?
3. What is the process for screen printing?

The questions were presented one at time and the class were given time to consider their answer. They were encouraged to write down anything that came to mind and to discuss their answers out loud. We wanted to avoid any potential competition or conflict that might arise where whispering and covered up pages were evident. Each question was dealt with in turn and we ensure that all apprentices got involved in the answering rather than just one or two of the more extrovert types. We allowed a free flowing general discussion to follow each question while trying to steer them in the right direction. We attempted to turn it into a bit of a game by dropping hints as the apprentices became more engaged. This appeared to be effective as the level of engagement was good with no pair staying silent or not contributing. We were attempting to get the apprentices to engage with the learning to promote deeper learning as this can occur when a student is personally and actively engaged [5].

3.1 Follow up

The workshop session was lively and the class appeared to enjoy it. We spent approximately two hours on the workshop exercise. We did not want to run it for too long in the event that it became too onerous for the apprentices. We then took a short break and went to the classroom. The three headings of manufacture, tools, and process were written on the blackboard and the apprentices were asked to answer the three questions posed in the workshop. This was an individual exercise and their answers were collected for review by us both.

From our review of the answers provided in class it was evident that the apprentices grasped the fundamentals of the process. However, it has to be said that they did not fully grasp the correct terms for each stage. This was more than acceptable to us as it meant that before we delivered the lectures covering this module they at least appeared to have some understanding of complexity of the topic. The normal lectures were then delivered and it became very evident that the levels of engagement with the material were high. Our experience of delivering the lectures was very different than previous experience as the attention of the class was very much focussed on the topic.

We discussed the efficacy of this initiative and agreed to continue with this approach. We then repeated this method of delivering this module through workshop activities supporting the lectures with a further two groups of Phase 6 apprentices.

4 RESULTS

Following the changing of the lecture format our analysis of the subsequent exam papers showed significant increase in the correct answering the screen printing questions. In total three groups of Phase 6 apprentices took part in the workshop lecture on screen printing. At the end of the 10 week block release each Phase 6 group then sat their theory exam paper. Our initial analysis of pre-workshop activities showed that 75% of the questions were answered incorrectly. From the post
workshop analysis of the 12 questions from the subsequent theory tests it could be seen that only 25% of the questions were answered incorrectly – see Table 1 for a comparison of the results. A total of 12 questions were asked over the course of the three subsequent theory tests and from those twelve a total of nine were answered correctly and three were answered incorrectly. The quality of the answers also improved with a marked increase in the depth of the answers versus pre workshop lecture answers. This was incredibly satisfying for us both at a professional level and also for the apprentices. As indicated previously the Phase 6 theory test is a high stakes exam and it appeared to become more manageable for them.

Table 1. Comparison of results.

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>Correct</th>
<th>Incorrect</th>
</tr>
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<tbody>
<tr>
<td>Pre-workshop</td>
<td>24 questions</td>
<td>6</td>
<td>18</td>
</tr>
<tr>
<td>Post workshop</td>
<td>12 questions</td>
<td>9</td>
<td>3</td>
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5 CONCLUSIONS

Following the workshop exercise our experience of delivering the lectures for this module was very different. As lecturers with almost 40 years’ experience between us we have compared the current standards based apprentice with the previous time served apprenticeship system. The current system of block release means that the apprentices are engaged in a lot of classroom time over that block release period of time. Typically, the apprentices would be in the classroom sitting for at least two hours every day. Construction apprentices are normally working in a highly active environment and this system is different to their ordinary everyday experience in the workplace. The previous apprenticeship system, of which the both of us are products, involved weekly day release over a four year period. The time spent in the classroom was equivalent but was spread out over a longer period of time so did not feel so stifling. The day this research was carried out involved minimum time in the classroom and the change in attitude of the apprentices was evident. They enjoyed the active element of the day.

When running this module previously apprentices had often referred to it as history lesson. We heard no apprentice referring to it in a derogatory manner. Indeed, this time some apprentices were talking about screen printing as a small side project they could potentially engage in. From a learner’s perspective there is no doubt that it proved effective. From a teachers perspective it is satisfying to see an increase in the numbers of apprentices answering the assessment questions correctly. Such a small innovation has had a major impact on the apprentices as there are less failing their Phase 6 theory module. As mentioned previously the pass rate is set at 70% or 21 questions to be answered correctly to achieve a pass. Having the confidence and knowledge to answer the questions on the screen printing module relieves some of the pressure the apprentices feel as they approach the end of their apprenticeship.

We have both undertaken a further analysis of the results to identify other weak areas that apprentices may have. We are keen to adapt and change as required in order to provide a more rounded and enjoyable learning experience for the apprentice. Undertaking such an initiative was seen to relieve some of the pressure that we would have previously seen in other classes as the theory test approached. There may well be other areas that could be changed in order to facilitate deeper learning also. Of course, there is a deeper issue regarding the actual curriculum and its inherent components. We are both working towards resolving those issues if possible but seeing as the curriculum is implemented nationally by Solas we are unsure of the impact we can have when pushing for change.

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REFERENCES


