EXAMINATION OF ISSUES EFFECTING THE TEACHING AND LEARNING OF LARGE COHORTS WITHIN PRACTICAL BASED SUBJECTS

Abstract

The aim of this work is to advance the teaching and learning of practical based subjects in the Higher Education (HE) sector. Part of the study involved the development of a model that enhanced the teaching and learning of textiles within large groups of clothing design learners. This paper begins by reviewing current literature regarding adult learning. The middle section discusses the findings of a previous study conducted in HE over a period of three years, which focused on promoting autonomous learning within the domain of textiles/materials. The current investigation examined the use of active learning strategies within practical based subjects for large cohorts of level 4 (NQF) undergraduate learners. The study measures the effectiveness of active learning through a practitioner reflective journal, descriptive statistics obtained through learner formative evaluation, engagement and attainment. It was concluded that active learning was a successful strategy to promote; the development of metacognition, effective progression to autonomous learning and the enhancement of employability skills.

1.0 Introduction

With the continual increase in cohort numbers many Higher Education institutions are required to address and monitor effective teaching and learning strategies, and the demand on the resources required (Kember, 2000; McGill & Beaty, 2001). In past years the rise in cohort numbers has resulted in practical

based subjects being presented to the clothing design learners in a passive form or alternatively being watered down significantly in terms of class contact hours. Recent studies conducted internally have proven that this is not the most effective teaching and learning strategy and moves have recently been implemented to conform to an active learning format for a selection of learners. This involved the promotion of metacognition through problem solving activities resulting in the pooling of information between peers. If this teaching & learning strategy is introduced to large cohorts it will have a significant impact regarding the number of repeats for each practical seminar and thus implications for staff teaching hours. It is therefore proposed to fully examine the most effective method to deliver practical based subjects within large cohorts, maximising the learning experience and contact hours of the group and minimising the number of repeats of any one seminar. If this trial is successful the findings will benefit many practical subjects within HE and contribute to the development of the learners' key/professional skills (in relation to autonomy). The previous active research that was conducted over a period of three years has already had positive implications in terms of the teaching and learning of textiles (fashion materials) across the fashion design programme and has resulted in many learners actively engaging more with other university resources (library), thus promoting autonomous learning. This supports Blumberg and Michael's (1992) study, where it was found that students taught using a problem based learning (PBL) approach borrowed more library material than conventional students. In addition it was proven that attendance improved generally when an active learning strategy was implemented and a positive link between learning and

engagement could be established, through mapping attendance with academic achievement.

2.0 Teaching in HE

Many authors have acknowledged that there has been a considerable amount of research and development within HE over the last 25 years in respect to effective teaching and learning (Knowles & Associates, 1984; Cannon & Newble, 2000; Somekh, 2006; Greasley & Ashworth, 2007; Ha-Brookshire, 2008). An important study by Pascarella & Terenzini (2005) highlighted two themes for research in US HE, the first being, the central role of other people and the stimulation they provide for learning. The second, the amount of learner effort and educational reward. Other authors (Downing et al, 2007; Greasley & Ashworth, 2007; Downing et al 2009) have acknowledged that one factor that influences learning is the educator, Cannon & Newble (2000) summarised this as a "two-way bargain" it is the lecturer's responsibility to create a stimulating environment to promote interaction and a learner's responsibility to actively engage. The current HE climate promotes lifelong learning and widening participation, resulting in a diverse learner population. This climate promotes the study of andragogy & metacognition to formulate a knowledge and understanding of how adult learners learn (McGill & Beaty, 2001).

2.1 How learners learn

A study conducted by two Swedish researchers shifted the general understanding of learning in HE by concluding that individual learners can comprehend knowledge differently depending on their learning style (Marton & Saljo, 1976). Later work in the 90s expanded this understanding by using two methodologies, phenomenography and phenomenology, it concluded that a distinct factor which influenced learning was indeed the individuals approach to study (Greasley & Ashworth, 2007). Cannon & Newble (2000) summarised this by suggesting that learning can be influenced by a number of factors, one of these was learner characteristics. There are three general principles to which Piagetian theorist agree Driscoll (1994): The first is that the learning environment should support the activity of the learner. The second is an acknowledgement that interactions with peers are an important source of cognitive development. The final is to promote an instructional strategy that makes learners aware of conflicts and inconsistencies in their thinking to enhance cognitive development (problem solving). It is important to identify with and understand the needs of the learners especially within the diverse HE population were learners may be from non-traditional entry routes or a variety of different cultures. Knowing your learner and utilising their prior knowledge and experiences contributes effectively to creating and sustaining a supportive learning environment that actively promotes a deep learning approach (Piaget, 1977; Von Wright, 1992; Mayes, 1998; Downing, 2001; Downing et al, 2007; Downing et al, 2009).

2.2 Metacognition

Metacognition has been described by many authors as the thinking about thinking (Flavell, 1999; Downing et al, 2007; Downing et al, 2009). However in reality it reaches far beyond the thinking stage involving planning, reflection, analysis and summaries to be drawn. It is much broader than understanding and creating an awareness of a task; it encompasses knowledge and the ability to direct thinking, hence putting into practice what has been learned. Metacognition differs from cognition by focusing on the process of problem solving (Marchant, 1989). It is widely accepted that in order to problem solve, students should have some understanding of how they perform cognitive tasks. Research has shown that if students feels confident in the ability to problem solve they tend to perform better in assessment (Cornoldi, 1998). Downing et al (2007) acknowledged that the development of skills of metacognitive and self reflection were vital prior to building controlled metacoginitve strategies. 'In our rapidly changing world, the challenge for teachers is to help undergraduate students develop skills that will not become obsolete. As such, metacognitive strategies are essential for the twenty-first century because they will enable students to successfully cope with new situations, and challenges of lifelong learning' (Downing, 2007, p.11). This is a view supported by an earlier study where it was found that students taught by PBL developed strategies that would allow them to learn well in later professional development (Hmelo et al, 1997).

The deficiency of any andragogical model is that the learning is very much driven by a need to know, to perform some aspect of a task. Hence, there is a risk that not all the subject contents will be learned, but perhaps this is outweighed by understanding of the process. Providing a mid point in terms of

introducing the learners to a process model within a supportive framework (Downing et al, 2007; Downing et al, 2009) is essential at the early stages of HE to enable the learners to explore different learning styles in a safe environment, prior to progressing to the level of autonomy expected at Honours Level. Active learning was one important strategy identified to promote the transition from dependant learners to independent learners within the process model (Kember, 2000; McGill & Beaty, 2001; Kelly, 2004).

2.3 Active learning models

Historically action projects were used more in industry than in academia since they are geared to achieving action targets or goals. This involves defining the necessary tasks in an investigation to increase the working group's knowledge of the problem. Knowles (1980) suggested in the early 80s that if educational components are included in the initial action this approach to solving a problem could be a suitable format for learning. Two useful active learning models were identified as part of Knowles study (organic and operational). Generally the organic model defines the goals (or objectives as they become within education) but it is up to the learner to work out a suitable plan to achieve them, this can perhaps be associated with the modern learner centred approach in teaching and learning. The second model (operational) provides a more supported approach to learning. The learner is active in the task but is working within a given framework (providing some element of order). Active learning by its very nature is more suitable to smaller group teaching because of the amount and nature of activity. Cannon & Newble (2000) associate these

activities to individual working and small groups of 2-4 persons. However, later they acknowledge that active learning strategies can be utilised quite successful in large groups and provide examples which all tend to fall into Knowles operational model. Hence, it is more practical with large groups to manage the active learning within a contained framework.

3.0 Problems with large cohort teaching

The problems associated with large cohort teaching often revolve around the lack of opportunities for participation and the lack of learner interaction (McGill & Beaty, 2001). Generally speaking large cohort teaching does not fit with the active learning approach (Boud, 1981; Neary, 2002; Cannon & Newble, 2000). When teaching large learner cohorts, difficulties are experienced with class interaction, and quite often the temptation is to revert to traditional lecturing techniques (Cannon & Newble, 2000). One of the key factors to maximise learner interaction opportunities is to create a safe/secure environment, which a large cohort by its very nature does not promote, individuals may not be confident enough or comfortable expressing personal views (Neary, 2002). This therefore inhibits discussion/interaction and perhaps minimises learning. The challenge in this research is to devise methods of inspiring and stimulating large cohorts of learners through effective use of active learning and to promote the development of metacognition.

3.1 Diversity of learners

There is a government drive to widen participation and lifelong learning – motivated by a Green Paper (DFEE, 1998). In addition internal HE policy often promotes an increase in the number of international learners. This presents a whole new dimension to teaching and learning in HE. Large cohort sizes combined with non-traditional learners and a relatively high proportion of international learners. This provides a challenge for the active learning strategy, in terms of meeting the needs of the individual learners with culturally different backgrounds, knowledge and educational experiences. It is essential that within the active framework, previous learner experience is utilised effectively to enhance learning (Piaget, 1977; Von Wright, 1992; Mayes, 1998; Cannon & Newble, 2000; Kember, 2000; Downing, 2001; McGill & Beaty, 2001; Downing et al, 2007; Downing et al, 2009).

4.0 Previous work

Active Research conducted over the period 2003-2006 examined the benefits of introducing active learning with elements of PBL into the textile/materials curriculum for large cohorts (Power, 2007). The research was split into four phases, initially evaluating a traditional based passive approach to lecturing a large group of fashion and clothing learners (100+ learners). The second phase determined if cohorts of similar academic disciplines (clothing and fashion) required different approaches regarding the content and delivery of the curriculum. Phase three of the research implemented an active learning strategy to a cohort of fashion learners (group size 50) and monitored its effectiveness through learner opinion, practitioner reflective journal,

engagement and attainment. The final phase of the research made recommendations for implementing the active learning strategy to larger cohorts (70 - 80 learners). The findings of the four phases are summarised in the paragraphs to follow.

4.1 Summary of the previous active research study (2003-2006)

The first phase of the active research conducted in 2003/2004 was evaluated using four methods, a practitioner reflective journal, learner formative feedback; attendance and attainment (level 4 learners). Various teaching and learning strategies were utilised throughout the year beginning with a traditional lecture format and moving into more interactive approaches all based within a fixed seated lecture theatre. It was concluded through observation that there was less engagement when using a traditional format to deliver the curriculum. Even introducing small windows of opportunities for interaction (such as a series of questions or small activity) greatly improved the learning. However, it could be argued that the fact that there was increased two-way communication just made it easier to identify that learning was taking place. The entry behaviour (in terms of prior knowledge) of the two learner groups (group one consisted of fashion marketing learners and group two was a combination of fashion and clothing learners) evaluated in this trial varied significantly, what was interesting was that both groups preferred the interactive teaching methods rather than the traditional passive lecturing approach (Power, 2007).

4.2 Importance of entry behaviour

Within phase one it became apparent that the fashion marketing learners entry behaviour in terms of textile/material knowledge was vastly different to that of the fashion and clothing learners (where over 2/3s of the class had previously studied textiles in some form). This resulted in a new unit being devised for the marketing learners, which had a higher concentration of basic textile knowledge and much more interaction opportunities. Phase two of the action research focused on identifying if the clothing and fashion learners (previously grouped together) had different requirements in terms of teaching and learning. This resulted in two learner groups, the smallest, being slightly over 50 learners. During the traditional lectures more opportunities for interaction were introduced within the teaching to all groups. It was found through the practitioner journal that there were significant differences in the learning styles. The fashion learners were very interactive, engaging readily in all the activities but preferring the discussions focused around textiles in the context of fashion design. The clothing learners in the same activities excelled in problem solving and preferred the discussions to focus on more specific information regarding the properties of the material to enable them to assess the materials constructive value. It was noted that in all groups the learners preferred interactive styles of teaching and the problem solving activities (Power, 2007).

4.3 Active learning plan

Phase three of the active research focused on introducing a significantly higher concentration of practical activity within the smallest learner cohort (55 level 4

fashion learners), there was a strong push within the HE sector regarding the promotion of autonomous learners and the active learning strategy was identified as the most suitable approach in terms of the teaching and learning of textile/materials. A three-stage approach was adopted (which fitted into the principles of cognition described by Driscoll (1994)); firstly the lecture environment was changed from two hours in a fixed seated room (which promoted a traditional lecture), to a single hour in fixed seated accommodation (to deliver theory) and 2 hours practical seminar (in a less formal setting) with the group split in half. Secondly a unique practical approach was adopted during the seminars, which encouraged peers to pool information. Hence, all the learners were given the same tasks in groups of around 6, but each group focused on a different material specimen - a chart on a white board allowed them to write up their findings and intense group discussion occurred at the end of each seminar to ensure all the information was correct. Hence, not only were individuals responsible for their own learning, but for the entire group and class. Finally the assessment strategy was changed to a portfolio of assessment enabling the learners to produce an individual learning resource supporting each class session with self-study, rather than a final assignment demonstrating knowledge in a limited area of textiles. The whole dynamics of the learning shifted, the learners had many opportunities of fulfilling the learning outcomes, rather than the traditional format of accrediting marks based on 1 final assessment.

4.4 Phase 3 of the active research study (2003-2006)

The effectiveness of the practical seminar sessions were evaluated by the practitioner reflective journal, learner evaluation, attendance and engagement, this is discussed in some detail in a previous publication (Power, 2007). The general findings are presented in Table 1. It was concluded that autonomous learning and metacognition was actively promoted through a range of problem solving activities under the umbrella of active learning. This provided the backbone to various topics and enthused the learner to participate in further investigation through independent study, thus reflection was occurring. The new assessment strategy encouraged the learner to engage in the activities, thus, participating in the expansion of their personal knowledge and improvement of their understanding of the fashion/textiles relationship. A combination of short lectures followed by practical activity enabled interaction to occur between the lecturer and learners thus identifying quickly any misunderstanding or gaps in the individual/group's knowledge in relation to the activity undertaken. Learners were actively engaging by asking questions thus taking full responsibility for their own learning. The pooling of information amongst the groups enforced further accountability to be taken by individuals regarding the accuracy of the information obtained. Throughout the practical activities intense discussion was promoted and the lecturer filtered between various roles, expert, facilitator, and technician. Many learners not only supported their learning through secondary research, they actively pursued further sources of information through primary research. Thus, providing further evidence of the development of autonomous leaning. The portfolio method of assessment enabled monitoring of learning and understanding to occur at various intervals. All the learners developed a wider command of technical

language through the high level of communication and feedback throughout the sessions. Most of the learners benefited from the new portfolio style of assessment and engagement/commitment to their studies appeared to increase. One major disadvantage of this teaching approach was that the learners were still heavily reliant on the lecturer to devise the activity and source the material samples. Thus, suggesting that there is further justification to investigate active learning strategies and methods of supporting the transition to complete autonomous learning.

Table 1

Summary of the active learning strategy (2003-2006).

4.5 Phase 4 of the active research study (2003-2006)

It can be seen from the findings presented in Table 1 that the active learning strategy was promoting the transition from dependant learners to independent learners. However there are still many issues to be considered prior to adopting an active learning model to a larger cohort. To conclude the 2003-2006 practitioner active research, a plan was drawn up consisting of a number of bullet points outlining areas for further consideration prior to implementation of an active learning strategy to a larger cohort.

- Devise practical activities using problem based learning and methods of monitoring the level of interaction for larger group sizes.

- Examine timetabling to ensure all learners are allocated weekly time for seminar activities.

- Evaluate the learning outcomes and the assessment strategy, to maximise the learners' opportunity of fulfilling the learning outcomes.

- Relate part of the learning to other modules – specifically design, focusing on specific fabrics.

- Focus on promoting autonomous learning and the development of metacognition skills.

- Monitoring attendance, unit satisfaction, achievement of learning outcomes and engagement with scholarly activity.

- Establish industry contacts specific to recent textile innovations.

- Through a new curriculum promote knowledge and understanding in textiles and raise the learner's awareness regarding the relationship between textiles and clothing.

5.0 Active learning strategies to promote autonomy in large groups

Despite the success of the active learning strategy's in the earlier study (2003-2006) a new approach was required to facilitate active learning within a larger cohort (70-80 learners). In order to fully promote autonomous learning there needed to be a move away from a controlled framework; hence, the academic should assume the role of facilitator. If this approach was adopted, the obvious model to implement would be the organic active learning model as previously described (Paragraph 2.3). However, this strategy needs to be approached with caution since it relies on the learners driving the project through to completion

and that requires the learners to have developed high levels of self-directed learning skills and discipline prior. Since this curriculum was intended for year 1 (level 4 NQF) undergraduate learners with varied entry behaviour it is essential that the necessary support was in place to facilitate the transition to autonomous learners (McGill & Beaty, 2001; Downing et al, 2007; Downing et al, 2009). Therefore, adopting an organic approach within an operational model would appear a more sensible strategy, since this approach can lend itself well to practical groupwork activities.

5.1 The organic approach to active learning within an operation model

If the large cohort (70-80 individuals) was split into smaller groups and the groups are working within an action learning operational model (framework), it would be possible for the lecturer to assume the role of procedural technician and resource person or coach (Knowles, 1980; McGill & Beaty, 2001). Within each group an organic approach could be adapted. For example a weekly task may be allocated and the learners are asked to discuss the actions required to achieve that task (thus promoting an organic approach within an operational model). By breaking the cohort into groups to some extent the lecturer can address group concerns directly, thus, creating student centred learning. The large cohort can be reformulated weekly to reflect on the actions of the previous week and how these relate to the new tasks (thus, promoting skills of metacognition). The previous action learning trial was a success in terms of learner engagement, satisfaction and the development of metacognition. However, one of the problems identified was that it did not provide the support

necessary to enable the learners to progress fully to autonomous learners since all the activities and textile materials were devised and provided by the lecturer (hence, skills such as problem solving and the subject knowledge were increased, but perhaps so was the reliance on the lecturer for guidance). Therefore, perhaps this is not the most effective model to expand out to larger groups. If autonomy was to be promoted in large groups within HE, then best practise would be to encourage active learning in groups grounded in the process operational model (controlled framework) with windows of opportunity for the organic model (student centred - enabling the group to make key decisions to progress along a series of tasks). This would move the lecturer into a facilitator role, which would reduce the material resources required. The aim of the new model was to deliver the same curriculum content but change the active learning model. Hence, to provide a journey of discovery the learners were provided with key information to aid their learning and influence the selection of practical activity on a weekly basis, but it was up to the group to conduct the activity and assess the outcome in relation to their own group project and find the evidence to support this.

6.0 The project

The model illustrated in Figure 1 was used as the base of the active learning. Each group of eight/nine members (randomly selected) was provided with an individual garment, each produced from a different; raw material (fibre), yarn construction method, fabric manufacturing technique, and textile finishing method. The project involved providing the learners with a series of instruction

to enable them to dissect their garment, in order to identify at various stages how their garment was constructed and the reasoning behind that decision (see Figure 1). The (1 hour) lectures became a series of instructions to alert the learners to the choices in terms of tasks related to each of the topics, the practical sessions (see Figure 1, supportive framework) were split between 3 staff members (1 academic, 1 academic assistant , 1 technician) which equated to 1 hour per group, to support, a) the task preparation (indicated in the light grey boxes), b) the task (indicated in the dark grey boxes), and c) monitoring and supporting the development of metacognition (indicated in the black boxes). The assessment strategy was a group portfolio analysing how a garment was manufactured (in terms of materials) supported intensively with evidence of self-study. In addition each group had to disseminate their findings back to their peers via a PowerPoint presentation (which was written up and included as part of the portfolio assessment).

Figure 1

Active learning operational model for larger cohorts.

7.0 Evaluation methodology

The evaluation strategy included four methodologies; the practitioner journal, learner feedback, attendance records and assessment. The practitioner journal was a combination of, a) informal observations based on discussions and activities with each group on a weekly basis (completed by the academic) and

b) formal interviews with the groups on a weekly basis (completed by the academic assistant). The journal was cross referenced for common themes over a twelve week period. Learner feedback was obtained at week 12 via a formative feedback questionnaire which focused directly on issues related to learning, teaching and general aspects of the unit. The questionnaire was modified from an existing format and used a Likert scale response. The feedback sheets were analysed using SPSS software. Most of the questionnaire focused around closed questions, asking the respondent to agree, disagree on a scale of 6 (strongly agree, agree, neutral, disagree, strongly disagree and not applicable), However, some questions were open ended and were coded to enable common themes to be established. Attendance was taken weekly during the lecture and at each 20 minute seminar/practical; this was cross referenced with a manual head count. Assessment was recorded and plotted against attendance to assess the correlation.

7.1 Summary of the practitioner reflective journal

The reflective journal was a document built up on a weekly basis by the academic over the twelve weeks of teaching. The document contains two aspects, informal observation and discussion in relation to the study of metacognition, this was mainly obtained from the academic and technician's observations during the practical seminars; and the more formal monitoring of the groups by the academic assistant, this was a weekly interview with each individual group, a series of questions were devised covering three broad

categories (understanding of the tasks, application and planning, and content knowledge). At the end of twelve weeks the first four weeks of the practitioner's reflective journal was analysed to obtain a series of themes. These are presented in Table 2, the reflective journal was then re-analysed using the established theme codes to identify the frequency. Using the active learning model illustrated in Figure 1 the most prominent theme was the development of autonomous learning skills, this was demonstrated through a range of actions including the learners understanding, interpretation and activity within the weekly tasks, The second most common theme was the development of employability skills, demonstrated through the management, communication, and reflection of the groups activities. There appeared to be less emphasis on subject understanding and knowledge as the learners focused on the process rather than the product. Of course not all the groups engaged or worked well, indeed some of the groups did not progress to the required level of autonomy expected and group communication broke down at various stages. The operational model however, provided the academic team with some element to intervene to prevent the project failing. If an organic approach (as described in Paragraph 2.3) had been utilised some groups may not have fulfilled the units learning outcomes or developed any skills of autonomy. It was concluded from the practitioner reflective journal that the operation model may not develop all learners to the same level of autonomy as the organic model. However, it supports the transition and provides a safety net by enabling the learners to achieve small quests whilst developing the necessary skills of metacognition, as they become more comfortable with the active style of learning, it also enables intervention at an early stage to prevent the projects failing. It could be argued

that external intervention goes against the autonomous learning strategy, however in such large groups it is essential that engagement is maintained to prevent learners becoming despondent. At the end of the twelve weeks it was concluded from the practitioner reflective journal that most of the groups had developed some autonomy skills; four groups had excelled to be able to self manage and reflect, three groups had made significant steps to autonomy but still required guidance and clarification, the remaining two groups struggled with the concept of active learning and failed to develop autonomy skills, however, this was in part due to poor attendance and lack of engagement.

Table 2

Frequency of themes identified from the practitioner's reflective journal.

7.2 Learner feedback questionnaires

The unit provided a formative feedback questionnaire for the learners to express their views in relation to the textiles/materials element of the unit. The feedback opportunity was provided on the last day of teaching (the learners peer presentation day), which ensured maximum attendance. The questionnaire was split into three sections enabling the learner to express views regarding; learning, teaching, and general comments. 40/74 learners completed the feedback (54%) and the data was analysed using the SPSS software package. The majority of the questionnaire focuses around closed questions using a

Likert scale; however, some questions were open ended, in these cases the responses were coded to enabling common themes to be evaluated.

Perception of "learning"

This was evaluated using a series of 9 closed questions with the opportunity for the learners to comment further in relation to groupwork, attendance and wider reading. 80% of the learners agreed (with 17.5% strongly agreeing) that the unit proceeded at a pace they were able to cope with. 75% of learners acknowledged that the contents of the lecture (with 17.5% strongly agreeing) and assessment strategy (80% agreed, with 15% strongly agreeing) was clearly communicated. 57.5% of the learners either enjoyed or really enjoyed the unit (this was probably down to groupworking which appeared to be a problem for some learners) and 57.5% enjoyed working as a group. Only 50% thought the method of assessment allowed them to display their learning effectively this was perhaps linked to only 52.5% acknowledging that they had developed their self study skills (despite this being actively promoted at every opportunity). When asked if they agreed with the statement "I enjoyed working as a group" the most common feedback was linked to difficulties with group management, yet when the seminars and lecturers were geared to addressing study skills the attendance was poor.

Regarding attendance, the groups were more realistic when asked to comment on their attendance than the previous cohorts. The most common reasons for the reduced attendance level was sickness and learners selectively excluding lessons because they did not relate directly to the assessment. 95% of learners

noted that they had conducted some wider reading; however, only 2.5% of the responses reported that they had read over 20 articles.

Perception of "teaching"

Teaching was evaluated using a series of 6 closed questions. It was found that a high percentage of the group (over 90%) concluded that the teaching team for this unit were effective, well prepared and had good subject knowledge (evaluated over 3 questions). 82.5% of the learners agreed (with 30% strongly agreeing) that the lecturers were easy to approach outside class and 92.5 % agreed that the lecturers provided effective resources for learning (with 30% strongly agreeing). However, only 50% acknowledged that the lecturers provided satisfactory feedback on learning and performance, this was a cause for concern since the seminar process enabled the lecturers to provide verbal feedback on a weekly basis. This highlighted the fact that the learners' interpretation of feedback varied from the teaching teams, since it appears the weekly verbal feedback was not recognised by half of the respondees. In addition the learners were provided with a formal opportunity for feedback at week 6 and only 1/3 of the groups utilised this effectively.

General comments

The final section of the questionnaire comprised of a single closed question relating to the unit quality and 6 open ended questions to enable the learners to express views relating to unit improvement, content, wider implications of unit and autonomous learning. 70% the learners were satisfied with the quality of the unit with 10% expressing very satisfied. 80% of the responses offered

suggestions to improve the unit, which in the main identified problems with the timing of the seminars; this can be interpreted in two ways a) issues with the timetables or b) the learners not engaging with self study. Most of the learners did not offer any examples of the extra topics that they would like to see covered. The most popular lectures were the practical seminars reinforcing the feedback from previous years that more practical activity was required. 50% of the respondees commented that the subject did assist them outside the subject of textiles. Interestingly 72.5% stated that this model of learning (active) would assist them in their employment.

Evaluation from learner feedback

It was concluded from the learner feedback that the majority of respondees were satisfied with the content, pace, teaching and fully understood the assessment requirements. However, less were satisfied with the method of assessment (group portfolio), the development of study skills, the groupworking activity, feedback and the unit delivery structure (lectures and seminars). This is interesting since the study skills support was provided weekly and lectures relating to study skills were integrated directly into the unit, yet the attendance records reveal that these sessions had the lowest attendance. In addition 72.5% of the group recognised in a later question that this style of learning would assist them in their employment. This presents the question; do the findings imply that the learners are not able to evaluate the development of skills of metacognition. Further to this the learners were provided with weekly verbal feedback and a formal opportunity for feedback halfway through the unit and only 1/3 of the groups utilised this effectively. Again this presents a question:

Do learners understand the different types of feedback and the relevance of each? Finally in the general comments, annotations were made in relation to timetabling of the seminars as apposed to the actual unit delivery. Therefore, it can only be concluded that the learners were not satisfied with the waiting between seminars. However, this does present a question of why they were not utilising this time effectively as self study. It was concluded that the operational active learning model was an effective strategy to deliver a practical based subject to a large cohort. The findings from the learner formative questionnaire revealed that more emphasis needed to be placed on study skills (group working, independent research, autonomy, time management, effective communication, understanding and interpreting the types of feedback) to ensure seminars and practical activity are utilised successfully. In relation to the number of repeats of any seminar (practical/laboratory class), it is unavoidable that the lecturer contact time will be increased to facilitate small group experimentation, however, repeated seminars will be avoided by enabling the learners to work within the organic active learning model within the seminars (hence, enabling student centred learning).

7.3 Attendance

Figure 2 presents a chart plotting the unit attendance for the same unit over a period of 4 consecutive cohorts (any private study weeks have been omitted). It can be observed that year on year (with the exception of the 06-07 the attendance level showed signs of significant improvement, averages for each cohort (over all teaching weeks) are 03-04 49%, 04-05 59%, 05-06 76%, and

06-07 58.8%. For cohort 06-07 the teaching was moved from the first term into the second, which caused confusion regarding the timetabling at week one (hence the significantly low numbers (20%). If the first week was excluded from the calculations the average attendance for cohort 06-07 was 62.8% (see Figure 2) which would indicate that the attendance pattern is stabilising and the general attendance pattern (fluctuating) reverted back to the pattern seen in the earlier two years (03-04 and 04-05) not the steady decline illustrated for cohort 05-06. It should also be noted that the HND course which was included in the results presented in Figure 2 changed to a foundation degree in cohort 06-07, which did effect the overall averages. It was concluded that the operational active learning model did not significantly improve the overall attendance or individual attendance generally if compared to previous cohorts.

Figure 2

Attendance figures for four consecutive cohorts.

7.4 Assessment (quality of self directed study)

Figure 3 presents a chart illustrating the correlation between attendance and academic mark. It should be noted that there is a positive correlation for each successive cohort between 2003-2006. However, it should be noted that due to the marking criteria utilised during 2006 there is an almost true correlation between attendance and mark. The active learning model enabled the academic team to monitor engagement during the year, the mark was awarded

for the group portfolio in relation to the learning objectives and a proportion of the mark was lost if the learner did not participate in the active learning seminars and group presentation, (hence, the learners that did not contribute to the group portfolio or participate in the peer presentation were awarded 0%). Interestingly the group that was awarded the highest academic mark did not have the best attendees. The group with the best attendees however, was acknowledged through the practitioner journal to have developed skills of metacognition early in the study and was engaging and functioning effectively as a group. The peer presentations enabled the staff to comment regarding any errors or misconceptions in the evaluation of textile products and therefore feedback was provided verbally prior to the portfolios being submitted (although it was acknowledged by the learners that this had not been interpreted as feedback, since there were similar errors in the final submission).

Figure 3

Correlation between attendance and academic acheivement.

8.0 Evaluation

Key findings from the practitioner reflective journal and learner feedback clearly indicate that the active learning model is a successful strategy to deliver a practical based subject to a large cohort. It provided the structure to enable the majority of students to progress at a suitable pace and was found to promote scholarly activity and the development of skills related to, metacognition,

autonomy and employability. The active learning model presented in Figure 1 was found to be particularly effective since it focused on developing a strategy based around the general principles of metacognition to enable progression to the autonomous style of learning. The framework or scaffolding as described in Downing et al's (2007; 2009) later work was identified as a key factor in promoting PBL which clearly supports the findings of this study. Interestingly the findings from the learner formative feedback questionnaire revealed that more emphasis needed to be placed on the development of study skills at an earlier stage to ensure seminars and practical activity were utilised successfully. Despite the effort to address study skills there still appeared to be some confusion relating to learner expectation and reality, particularly in the area of feedback (perhaps this requires re-branding). In relation to the number of repeats of any seminar (practical/laboratory class), it is unavoidable that the lecturer contact time will be increased to facilitate small group experimentation however, repeated seminars will be avoided by enabling the learners to work organically within the devised framework. Assessment grading was reduced significantly by introducing the group portfolio assessment; however care must be taken to ensure the learners are fully aware of how the results are being derived. In the case of this trial the learners were fully informed during the early weeks and understood the implications of non-engagement. Despite the individuals awarded grades being linked to participation in the active learning, it was concluded that the new framework did not significantly improve the groups overall attendance or the individuals attendance (if compared to previous cohorts). However, it was found that the groups that developed skills of metacognition early in their studies achieved the highest academic mark (This

supports the findings of Cornoldi's (1998) work), even though they did not necessarily have the highest attendance. The portfolio did promote many opportunities for the learning outcomes to be achieved and as a result enabled the assessment to cover a higher percentage of subject content. When the spread of grades were compared to previous cohorts it was found that individual grades were higher. The assessment criteria had no method of evaluating if each group member had acquired the same level of knowledge. However, it could be argued that a traditional assignment only enables a small amount of the curriculum to be graded effectively and therefore has a similar disadvantage. In addition to the portfolio assessment, each group had to defend their findings through a peer presentation with questions. This provided the opportunity for the lecturer to determine understanding across the group and therefore the group portfolio was considered a more effective measure of learning. The study concluded that active learning is a successful strategy to promote; metacognition, effective progression to autonomous learning and the development of employability skills. However, it requires careful planning, organisation and monitoring if utilised in large group numbers. It was found that for year 1 (level 4 NQF) undergraduate learners, an operational model which provided a supportive framework was particularly successful in enabling progression to the autonomy required within Higher Education.

9.0 Recommendations for future action

There are six identifiable areas for further consideration. This trial evaluated a set of level 4 HE learners, but made no attempt to sub-divide the group into

those from non-traditional background and international learners. It would be interesting to explore these learner groups separately in relation to active learning and compare the findings. Secondly a greater emphasis needs to be placed on how study skills are branded. The trial identified that the study skills lectures were poorly attended, yet the learner feedback at the end of the unit concluded that more guidance was required. Further to this the learners acknowledged that they missed lecturers that they did not associate directly with assessment. Therefore, there is justification to remove the labelling of study skills and re-brand the lectures as assessment guidance or disguise it within the course content. In addition to this the learners' perception of feedback and lecturer's communication of feedback needs to be evaluated. Despite the active learning strategy providing feedback in various forms throughout this investigation, the learners failed to recognise some of the communication methods. This study evaluated the effectiveness of active learning using assessment as a key factor of success. More recent studies (Downing et al, 2007; Downing et al, 2009) relating to PBL have evaluated metacognitive development utilising LASSI (Learning and study strategies inventory). In further work it would be interesting to incorporate this into the evaluation strategy for active learning. Finally each group worked in isolation throughout this study, further exploration is required where the groups are given the opportunity to engage and communicate with other groups. This was one of the differences between the 2005/2006 trial (with 50 fashion learners) and the current study. It would be interesting to examine if this significantly improved attendance and the development of metacognition as it did in the prior study.

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