

Peer Assessment in Medical Science: An exploration of one programme's approach to peer assessment, including staff and student perceptions*

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Abstract

Assessment in Higher Education (HE) is widely accepted as fundamental to the learning process. The assessment strategy employed in a programme plays a major role in how, what and when students engage and as such influences the depth of learning that occurs. A well-structured holistic approach to assessment within a programme can be of a major benefit to both students and academics. The use of Peer Assessment (PA) and other more formative tools assists in the development of self-directed independent learners. A critical evaluation of the effectiveness of programme assessment strategies and methodologies involves the analysis of the current practice and the perceptions of all involved. As a starting point in the development of a framework for the cohesive inclusion of PA in the B.Sc(Hons) Medical Science degree programme in GMIT this paper presents an exploratory review of the current assessment methodology in use. Methodologically, following a documentary analysis approach, the programme's module descriptors were reviewed for content related to assessment methods in use. Staff and students of the programme were both surveyed to gain an insight into current practice and to document students' perceptions of their experience of assessment and of peer assessment in particular. The main findings demonstrated a marked lack of transparency and detail in relation to assessment strategy in the module documentation. Staff are using diverse assessment methods in this programme, including PA, albeit at individual module level. Students' perceptions and experiences of assessment and PA is overall positive. The programme and the students would benefit from a more structured programmatic approach to the inclusion of PA.

Keywords: Peer assessment; programme assessment; medical science

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1. Introduction

It has been widely demonstrated that assessment is a key driver of learning (Brown, 2004; Boud and Falchikov, 2006; Bloxham *et al.*, 2011; Race, 2014). Assessment methods used in a programme will shape the learning of the students and have a strong effect on student engagement, therefore changing assessment design and delivery can have a major effect on teaching and learning (Rust, 2002; Gibbs and Simpson, 2004; Carless, 2014; Carless and Zhou, 2015). Peer assessment (PA) is described as a method that can both increase student engagement and also offer students the opportunity to develop skills in evaluation and critical thinking. The inclusion of this assessment method in a programme's assessment strategy could be a major benefit to students (Topping, 1998; Tighe-Mooney, 2016). The importance of having a structured and programmatic approach to assessment design has been demonstrated by Jessop and Tomas (2016) in their review of 73 programmes in the UK.

The B.Sc. (Hons) Medical Science degree programme in GMIT is a professionally validated programme and is one of four such programmes available on the island of Ireland. Medical Science graduates are highly skilled and can practice in clinical laboratories providing a comprehensive range of laboratory testing for diagnosis and monitoring of disease. In practice Medical Scientists are routinely required to make decisions based on evaluation and critical reflection of a situation. To prepare Medical Science students for professional practice they should be offered the opportunity to develop these skills through both our teaching and our assessment strategy. While there is extensive published literature on assessment in higher education the assessment practices in Biomedical/Medical Science and specifically Medical Science education in Ireland have not been widely published.

As a starting point for a more programmatic approach to assessment and inclusion of more formative approach to assessment this paper reports an exploration of the assessment methodology in one professionally accredited programme in the area of Medical Science in Ireland. The aim of this exploratory research is firstly to review the assessment methods in the programme's module documentation and to compare this to the methods actually in use with particular interest to the documentation transparency and to the practice regarding the use of PA. Secondly, this research sought to gain an insight into the students' perceptions of PA.

A mixed method design was utilised. The systematic review of the GMIT Medical science programme assessment was carried out in 3 phases. Phase 1 was a document audit with the aim of quantifying the assessment methods visible in the module descriptors, similar to that previously performed within the Irish context (Guerin *et al.*, 2012). Phases 2 and 3 explored the practice, views and attitudes of academic staff and students of the programme collected via online surveys. The results from each phase were used to inform the design of the following phases, employing a sequential design as described by Creswell (2013).

This paper is structured as follows: firstly, the context of the current study is presented and a literature review on assessment and PA in HE is provided, the research methodology is then outlined, followed by findings, conclusions and recommendations.

2 Medical Science and the context of study

The four professionally validated programmes in the area of Biomedical Science on the island of Ireland are validated by either the Irish professional body, The Academy of Clinical Science and Laboratory Medicine (ACSLM) or the UK's Institute of Biomedical Science (IBMS); in some instances programmes are validated by both bodies. Graduates of these programmes have a level of competency, skills and knowledge that make them eligible to enter the profession of Medical Science. Practical skills and competency in the laboratory are core areas in the education of Medical Scientists in fact, clinical placement is an essential element for professional recognition.

Historically, similar to many professions, Medical Scientists were educated following an apprenticeship type model with more time spent 'at the bench' than in the class room (White and Mac Lellan, 2014). Apprenticeship training is described by Falchikov as "characterised by activity and social interaction within a context" and quotes Collins as this being the "natural way to learn" (Boud and Falchikov, 2007). Over time the education of the profession moved to educational institutions. In the education of future Medical Scientists, educators must try to recreate the learning as close to the apprenticeship model as possible (Sambell *et al.*, 2012). The programmes must deliver an appropriate balance of theory and practice and the assessment methods used must be aligned to both the professional and academic requirements (Schuwirth and Van der Vleuten, 2011).

The UK QAA Subject Benchmark Statement for Biomedical Sciences (2015) states that a learning, teaching and assessment strategy must be designed so that students can develop the necessary knowledge and skills, the aim being that as students' progress through the programme they will become more independent learners. The statement goes on to state that the assessment methods used should be "...both formative and summative and may include self and peer assessment. They provide evidence to employers of graduate attributes". Summative assessment will indicate the academic standards achieved. Formative assessment can be used as a tool to engage students, enhance the learning and assist in the development of the independent learners (Bloxham and Boyd, 2007). Peer assessment is an example of one such assessment tool. A programme needs to have a balance of both summative and formative assessment and a programmatic approach to assessment is therefore warranted (Schuwirth and Van der Vleuten, 2011).

In order to critically evaluate a programme's assessment strategy and to develop a more formative approach to assessment the current assessment methods must be analysed. Presented in this study is an exploration of the assessment methodologies in one professionally validated Medical Science programme. There is little published in the area of Medical Science education in Ireland and therefore as a starting point this initial research examines the current practice in one programme, the findings will serve as a basis for the design of future research and development into the area of assessment in the Medical Science discipline.

3 Assessment in Higher Education

Assessment is an integral part of programmes in Higher Education (HE) one of the main roles it plays is the demonstration of the maintenance of academic standards; as such assessment strategies are used as part of an institute's quality assurance scheme. However, assessment has changed over time from where it was used purely in the decision for progression within a programme to the current advances in the use of assessment as a tool for and as learning (Boud, 2003; Bryan and Clegg, 2006; Taras, 2008; Hernández, 2012; Bloxham, 2015). It is accepted that assessment and feedback play a major role in the type and effectiveness of the learning that occurs during a period of study. Taras, (2008) states that assessment and learning are in competition with each other for the position at the top of the educational experience and Biggs and Tang (2011) refer to assessment being the 'senior partner in learning and teaching'.

Students view assessment as what is important and will use 'cues' to direct their learning (Gibbs *et al.*, 2003; Bryan and Clegg, 2006; Race, 2010). It has been shown that the assessment methods used shape the learning of students, that is, that students' approach is reactive to the assessment methods employed (Rust, 2002; Carless, 2014). The method of assessment not only needs to be aligned with the learning outcomes of a module and of the programme but also needs to ensure that the student's approach is of a suitable depth. A programme's assessment strategy should assist in the use of appropriate learning i.e. that a deeper and higher order level of learning results (Scouller, 1998). Students do better in modules that have increased coursework (Gibbs and Simpson, 2004) and as such continuous assessment has become an integral part of the majority of modules in Irish Higher Education (Hernández, 2012). The use of varying assessment methodologies can also assist in ensuring the inclusiveness of all students (Scouller, 1998; Bloxham and Boyd, 2007; Hernández, 2012). A programme's assessment strategy therefore will not only provide evidence of educational standards but plays a key role in the learning process. The programme's assessment strategy can be used to develop and enhance the learning that occurs. The theme of programmatic assessment and the need for a cohesive and holistic approach to assessment is currently emerging in the literature. (Jessop and Tomas, 2016). The Irish Teaching and Learning National Forum enhancement theme 2016-2018 is focussing on assessment for/of/as learning and includes a focus on programmatic assessment.

The National Strategy for Higher Education, (2011) reports that there is a need to contextualise learning. Contextualised learning requires contextualised assessment. This report recommends the use of appropriate tools that would create a significant learning opportunity, such as case studies or problem based learning, the goal being that HE Institutes will develop lifelong learners capable of self-evaluation and reflection (Boud and Falchikov, 2006). If educators are to adopt this approach in teaching it is necessary that they match this with appropriate assessment methodologies (Sluijsmans *et al.*, 1999; Bloxham, 2015). Students need to develop the skills while in HE to be able to reflect and

monitor their own performance, as this is an attribute that will be expected in the workplace (Boud and Falchikov, 2007; QAA, 2015). An example of an assessment tool that can be used to help develop these skills is Peer Assessment (PA).

PA is described as an assessment tool that can both increase student engagement and offer enhanced learning to the student (Topping, 1998; Tighe-Mooney, 2016). In PA students learn the skills to be able to measure the worth, level and value of work submitted by a class mate (Topping, 1998; Topping, 2009). The use of PA is increasing in HE for a number of reasons such as enhancing student engagement and developing assessment skills (Casey *et al.*, 2011). PA is reported to increase interactions between students and to increase interactions with teaching staff (Casey *et al.*, 2011). If executed correctly PA offers the possibility of enhancing the learning experience for the student (Wen and Tsai, 2006). PA can help in the development of independent, reflective and active learners coupled with the skill of being able to evaluate and assign a mark (worth) to the work of others which can explain the value of PA within HE (Ballantyne *et al.*, 2002).

Some of the negative aspects associated with PA include student's lack of assessment literacy, lack of confidence in marking work, the time needed for the activity and ensuring that the activity is fair; these can all be overcome in how the activity is planned and implemented (Topping, 2009; Casey *et al.*, 2011; Kearney and Perkins, 2014). Lack of confidence in assigning a mark can be dealt with by running pilot marking sessions and by the provision of exemplars (Orsmond *et al.*, 2002; Kearney and Perkins, 2014). Reinholz (2016), describes the importance of preparation and student involvement in the generation of assessment criteria, a theme that is repeatedly cited in the literature (Orsmond *et al.*, 2002; Gibbs, 2010; Race, 2010; Race, 2014; Bloxham, 2015). Although PA can be used for students to develop the ability to assign a mark to a piece of work this may be a challenge as the literature is rich describing deficiencies in marking and emphasises the importance of both training and student involvement in assessment criteria (Rust and O'Donovan, 2003b; Bloxham *et al.*, 2011; Li *et al.*, 2015).

Effective and timely feedback is a key element to the success of any formative assessment activity (Brown, 2004; Race, 2010; Scott and Fortune, 2013). In PA students review the work of their peers but may also provide feedback, Mulder *et al.* (2014) described the unexpected learning that took place for students when writing reviews as part of a peer assessment activity. PA can assist in developing the students into reviewers and in delivering effective feedback to their peers.

The literature reports student perceptions of PA as mixed; students generally prefer the activity to be anonymous, like to see how their peers approached an assignment and generally appreciate peer feedback (Hughes, 2001; Stepanyan *et al.*, 2009; Casey *et al.*, 2011; Mulder *et al.*, 2014).

Presented in this paper is an exploration of the assessment strategy of one programme, the use of PA on the programme and the students' perceptions of this activity is also included. This is the initial stage of a more detailed research project into the development of a programmatic focused formative assessment strategy.

4 Research Methodology

In this small-scale study, which is part of a larger research project into the development of more formative assessment in Medical Science, a mixed method design was utilised. Mixed methods were deemed the most appropriate methodology for this exploration into the programme's assessment methodology as both quantitative and qualitative data was gathered and analysed, offering a balance between the two techniques (Tashakkori and Teddlie, 2010). The design of this research was an adaptation of the Transforming the Experience of Students through Assessment (TESTA) model as described by Jessop and Tomas (2016). The systematic review of assessment in this Medical Science programme was carried out in 3 phases. Phase 1 was a quantitative audit of the module descriptors. Phases 2 and 3 consisted of online surveys of the academic staff and students of the programme respectively. The results from each phase were used to inform the design of the following phases, employing a sequential design as described by Creswell (2013). The use of online surveys allowed easy and efficient gathering of data however, there was no room for deeper discussion, these results do give an initial indication of emerging themes and the data gathered can be used as for a starting point for further studies.

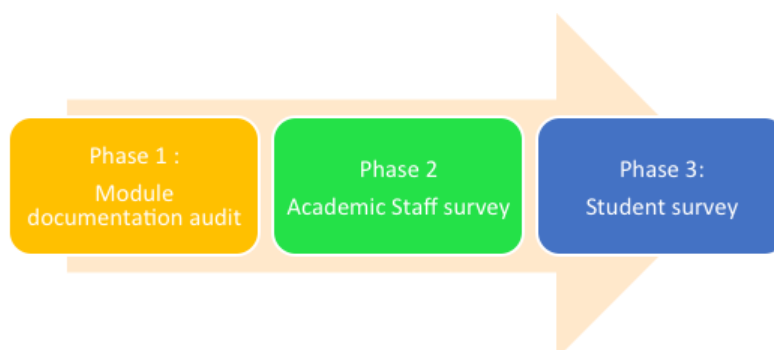


Figure 1 Schematic of research design

The audit of the module descriptors (n=33) involved recording the assessment methods listed for the programme. Note was taken if there was mention of peer assessment and if the module was assessed by 100% coursework or 100% final exam. The latter data illustrates the programmes overall approach to assessment and if traditional summative assessment prevails. For the majority of modules, the actual assessment methods used was not detailed, a statement similar to the following is included in the document: "Mixed assessment methods will be used that may include..." this is then followed by a number of possible assessment methods. As the actual assessment method is unknown this was recorded as Unspecified.

To gain an insight into current assessment practice a brief survey was devised and distributed to all academic staff (n=17) involved in the delivery of the programme. Responses (n=13) were collected anonymously using SurveyMonkey^R. The survey consisted of questions gathering information such as the length of time delivering modules on this programme, the number of modules staff deliver, the assessment methods they employ and whether or not they use peer assessment. If using PA staff were asked to give details of their PA activity; how they use it and in what year of the programme it is used (Appendix A).

Separately all students registered on the programme (n=115) were invited to complete an online anonymous survey using *Google forms* (Appendix B). The results from Phase 1 and 2 were used in the design of this survey. Students were asked what assessment methods they had experienced, based on the staff responses to the assessment methods they employ. Students responded to further questions e.g. if they had carried out PA, what PA activity they had experienced and asked to give their opinions of same. In total 79 students responded to the survey.

5 Research Findings

The following is a distillation of the main findings of this exploratory research into assessment and PA in this programme.

Phase 1 – Review of module descriptors:

The total number of modules reviewed was 33, assessment methods detailed in the descriptors were noted and the evidence of PA documented. It was also recorded if the module was assessed by final exam only or by continuous assessment only.

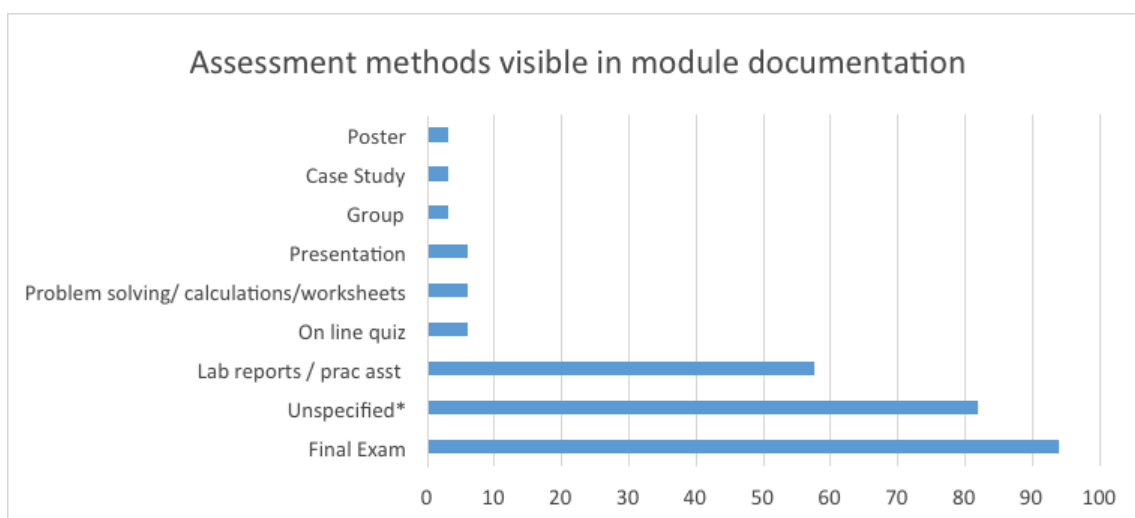


Figure 2: % of modules with specific assessment methods listed.

There is a strong emphasis on laboratory report generation and on the assessment of practical skills and knowledge. This review shows that it is difficult from the documentation to know exactly what assessment methods are actually being used, for the majority of the modules it is obvious that there is a broad range of assessment methods available for use but details of use are not given. It is also not obvious from the documentation of the link between assessment methods and specific learning outcomes. The documentation review did not reveal any mention of PA. There is no module assessed by final exam only and 2 (6%) of the modules are assessed 100% by coursework meaning that 94% of module have the traditional final exam as part of the assessment strategy.

Phase 2: Survey of academic staff.

Of the 17 academic staff involved in the programme 13 completed surveys were received, representing a response rate of 76%, all survey responses were included in the following analysis. The majority of the respondents (77%) had greater than 6 years' experience in the education of Medical Scientists and 30% of respondents are involved in the delivery of 5 or more modules in the programme, demonstrating a wide variety of experience and depth of involvement in the programme. Staff on the programme were asked to indicate the assessment methods they use, if they use PA and if so at what year of the programme. A brief description on the PA activity was requested and staff were also asked if their PA activity was a summative or formative assessment.

The assessment methods identified identified by these academics are displayed below:

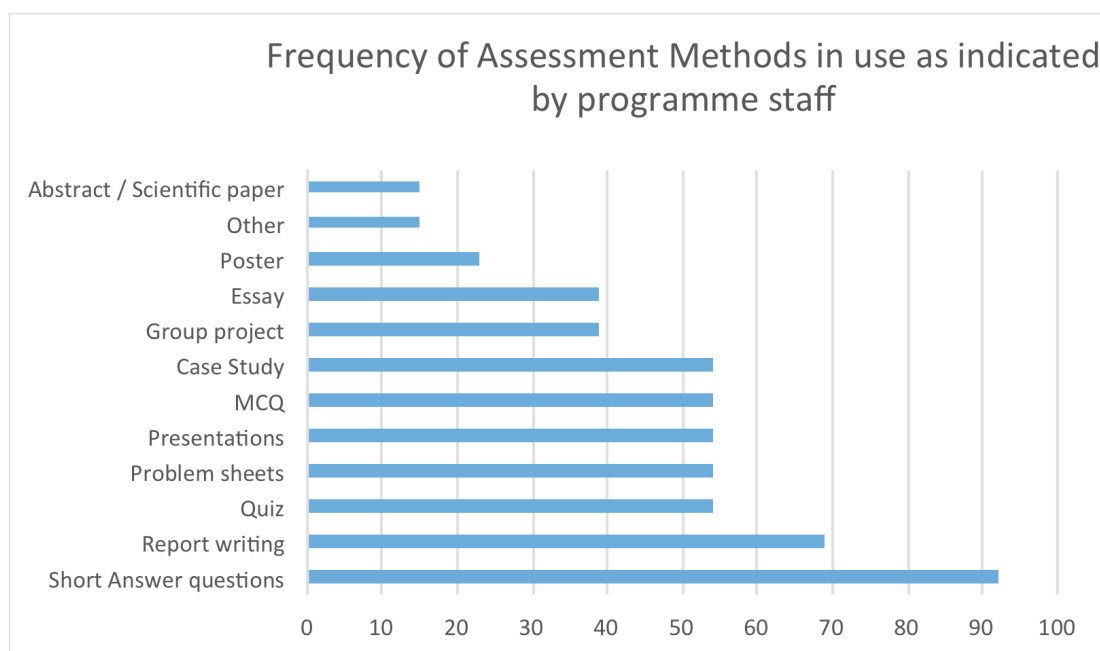


Figure 3: Assessment method employed in the programme as indicated by staff.

Similar to the module documentation review the survey revealed that there is strong emphasis on the assessment of the skills and knowledge relating to practical aspects of the programme with report writing, case studies and problem sheets among the most frequent methods listed. 'Short answer questions' is the assessment method used by 92% of the academics surveyed, presentations and MCQ assessment methods are also frequently used.

There appears to be broad diversity of assessment methods in use and in contrast with the documentation 61% of the staff survey respondents use PA in their modules. The use of PA varies as to the year of study it is employed in and how it is applied. The survey demonstrated use of PA in more than 1 year of the programme by 44%, with 22% using PA in year 1 only. The respondents implement PA in a number of different ways; students peer assess posters, presentations, group work and maths problem sheets. The role of PA in generating and receiving feedback was used in the description of PA activity by some staff members, as evidenced by this quote from the survey "...peers receive the benefit of deciding on assessment mark and presenters benefit from peer comments as well as those from lecturer. All students get to see where their skill point is at from both a peer and lecturer standpoint." Some staff members did describe their PA as a summative "...have students work on maths journal sheets, I require them to peer assess every two to three weeks in their journal/tutorial group. I input this mark into Moodle using the Moodle grading rubric so they get feedback..." The involvement of the students in the designing of the assessment criteria and what preparation and training that students undergo prior to the activity is not currently known and will be an area for further study.

Phase 3: Survey of students on the programme.

There were 79 completed surveys from the 115 students registered on the B.Sc. (Hons) Medical Science programme which represents a response rate of 68% and all survey responses were included in the analysis. There was a relatively equal distribution of responses from the 4 years of the programme, with the % of respondents for each year as follows - year one 22%; year two 25%; year three 29% and year four 24%.

Similar to the academic staff responses there is evidence of diversity in the assessment methods experienced by students.

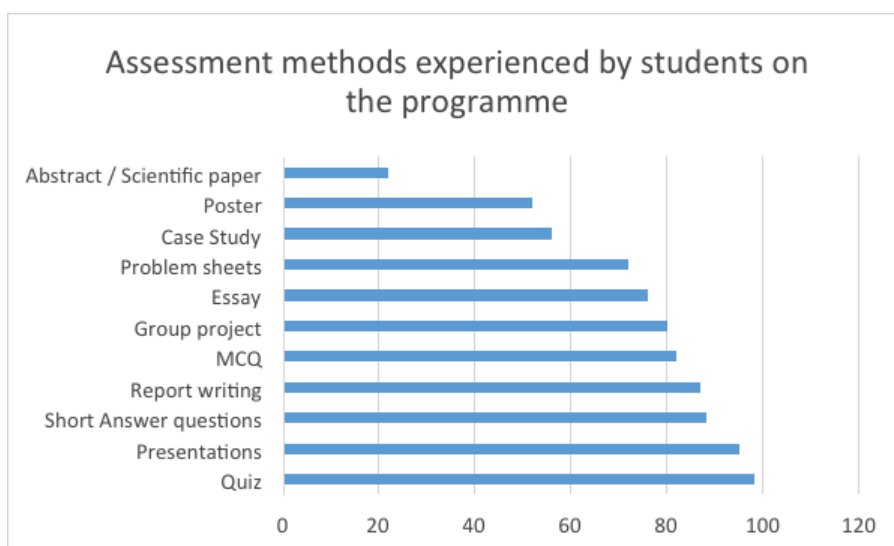


Figure 4: Assessment methods and % of students indicating having experienced this method.

When asked if they had carried out a PA activity, 96% of the students that responded indicated that they had experienced PA. The PA activities as described by students included maths problem sheets, presentations, laboratory reports, group work and posters, comparable to the staff responses. Students reported positively that PA allowed them to see other's work and to view different ways of approaching an assignment, that peer feedback can be more relevant than that of the lecturer and that it made them work harder as peers were reviewing the work. The student responses indicated engagement with the PA activity "Makes you think more critically about your own work" and demonstrated evidence of the learning benefits of PA

"You're able to learn from your peers especially by seeing the approach that they take on a lab report"

"It's often easier to understand what could have been done better".

Some PA activities required students to assign a mark and there is evidence that some found it challenging to do so on peer's work,

"I struggle with critiquing other people's work. It can be subjective and I find it hard to mark people down."

Others felt it could be a popularity contest, and that they find it tough to assess "Could be seen as a popularity contest. It is difficult to assess friends." If the PA activity was anonymous this difficulty could be overcome, this may be more difficult to do for some formats of PA than others e.g. marking of Maths problem sheets as used by one staff member.

In relation to peer feedback 72% of students stated that they found the feedback they received from peers useful and that the feedback would have a feedforward effect

"It helped me for future assignments as it gave me things to work on."

However, a minority of students did express negative comments:

"I'm not qualified to grade anyone's work."

Demonstrating a lack of confidence in their own or their peers' ability to assess and give feedback "I learn more from a teacher than from a student."

The next section of this paper discusses these findings in line with the literature and outlines recommendations and plans for further study in this area.

6 Analysis and Recommendations

This review of this programmes' assessment strategy demonstrated a diverse range of assessment tools in use with specific emphasis on practical skills and knowledge assessment. There is a lack of transparency in the documentation reviewed regarding the details of assessment methods in use. With regards to the inclusion of PA there is an obvious gap between the module documentation and practice. The main findings are summarised in Table 1.

| Phase 1 Documentation audit | Phase 2 Staff Survey | Phase 3 Student Survey |
|---|---|--|
| <ul style="list-style-type: none"> •Diverse assessment methods •No Evidence of PA •Lack of evidence of alignment of assessment with LO •Reliance on summative assessment | <ul style="list-style-type: none"> •Diverse assessment methods in use •61% use PA •PA- various formats and in all stages of programme | <ul style="list-style-type: none"> •Diverse assessment methods experienced •96% experienced PA •Perceptions of PA overall positive |

Table 1 Summary of main findings from the exploration of this programme's assessment strategy and practice.

The review of the module descriptors in phase 1 demonstrated the availability of comprehensive and diverse assessment methodologies, however, the documentation demonstrated limited information on the application of these assessment methods. In general, the information in the documentation lacks detail regarding assessment; the type and the timing of the assessment activities are not obvious. There is also no obvious link between assessment methods and specific learning outcomes. There are some advantages to this in that the module leader has autonomy in the way they employ, change and repeat assessment(s) during the delivery of the module, giving scope to adapt to the needs of each cohort of students (Bloxxham and Boyd, 2007). However, as assessment drives learning and is what students tend to focus on if would be beneficial for the programme to have assessments mapped to spread workload and encourage engagement (Gibbs and Simpson, 2004; Bryan and Clegg, 2006; Jessop and Tomas, 2016) It is not obvious from the review of the documentation if this is happening. The programme would benefit from a review and standardisation of the documentation to allow increased transparency in assessment methods.

Jessop et al (2014) highlights the need for a programmatic focus on assessment where assessment is structured so that there is a logical flow, this is also suggested by the QAA Integrative Assessment Guide No 2 (2007) stating that as a student progresses through a programme the work / assessment should be cumulative and have a feed forward effect. The recently published National Forum report (Forum, 2016) reiterates the need to have clear and transparent assessment details. The report states the need to ensure there is a balance established between staff flexibility and assessment methods being clearly documented. This will assist in ensuring that assessment is part of a programme and institutions priority. The literature is rich with the theme of constructive alignment and feed forward assessment however the academic discourse on a holistic and programmatic approach to such assessment strategies in the Irish context and in the area of Medical Science specifically is sparse (Rust, 2002; Schuwirth and Van der Vleuten, 2011). This study is the initial step in the development of

a framework for cohesive inclusion of PA as part of a programme formative assessment strategy.

There was no mention of PA in the documentation reviewed, as was similar to the work carried out by Guerin (2012). In contrast to 0% mention of PA in the documentation phase 2 of this research showed that 61% of staff respondents stated that they use peer assessment in their modules; PA is used in more than year 1 and almost all of the student respondents have participated in a PA activity. PA is being more widely applied than would appear from the programme documentation. There is an obvious gap between the documentation and practice which was akin to that demonstrated by Guerin *et al.* (2012) in their study. This study demonstrates that lecturers are using PA as an assessment method to enhance student engagement and to develop an awareness of criteria, although it is not visible in the documentation.

A more qualitative exploration into PA and its application is needed. Brown (2004) states that academics should include innovative assessment methods in their practice even if the institutional approach is more traditional. Carless (2015) supports the introduction of small changes to assessment to monitor effect. These are occurring in this programme albeit at individual module level. The use of PA is in an unstructured fashion and the programme would benefit from a more cohesive approach to the use of this methodology.

The student's perceptions of PA were mixed and in line with the literature (Hughes, 2001; Casey *et al.*, 2011; Mulder *et al.*, 2014). Generally, students liked seeing the work of others and comparing how their peers approached a particular assignment to their own approach. PA was seen as a form of revision, with one student stating that it "kept me engaged, a change from the norm", clearly demonstrating engagement with the activity. Students also made reference to an appreciation for marking criteria, which is a very positive outcome "I found it hard to determine the correct score" and "Didn't know how to mark properly" (Brown, 2004; Gibbs, 2010). Students did also express some negative comments regarding PA and in general they were related to what can best be described as a lack of self-confidence in reviewing the work of peers, a lack of confidence in peers' ability to review their work or concern over how peers approach the activity: "might not be fairly marked" these concerns are also in line with findings reported in the literature (Sluismans *et al.*, 1999; Stepanyan *et al.*, 2009). For PA to be successful it is essential that the participants are sufficiently prepared for the task (Orsmond *et al.*, 2000; Orsmond *et al.*, 2002; Reinholz, 2016). These issues raised by students warrant deeper discussion, Topping, (1998) highlights some of these issues in his review of PA and includes e.g. the importance of anonymity when designing a PA activity.

When describing their PA activity, peer feedback was mentioned by 2 members of staff. 72% of students reported finding peer feedback of use. Deeper discussion into the receipt and generation of peer feedback will be included in the next phase of this research.

From the staff survey (phase 2) 62% using PA do so to compare student marks to those of the academics. This may be a 'natural' starting point if we think of assessment as a tool of measuring what has been learned. It may be easier to 'mark' work in some modules, e.g. maths calculations, than

others. Challenges with this application of PA comes when we get into the need for 'tacit' knowledge and subtleties in understanding assessment criteria. The literature is rich describing deficiencies between markers and the limitations of 'scoring' work (Rust and O'Donovan, 2003a; Bloxham *et al.*, 2011). As previously mentioned for the staff that use PA it would be interesting to evaluate the preparation and training they carry out with students before the PA activity and if the students were involved in establishing the assessment criteria. All of these factors will influence the significance of marking differences (Topping, 1998; Orsmond *et al.*, 2000; Li *et al.*, 2015). Future studies will include discussions with staff on the practical and pedagogical issues associated with assessment and PA in particular.

7 Conclusion

Assessment in HE can have both a summative and formative role and a programmatic approach to assessment will help in balancing these roles. PA is a formative assessment tool that has the potential to assist in the development of key skills in students. The findings presented here are for one programme and while they can be used to inform and design the assessment strategy for this programme they will also serve as a foundation for deeper research into the area of assessment in Medical Science discipline area.

This review demonstrated that:

- The module documentation is lacking in detail and transparency in relation to the assessment strategy employed.
- Although there is a reliance on traditional summative exams individual programme members have introduced more formative assessment methodology, albeit, at module level only.
- PA is being used in this programme by academic members of staff but this is not visible in the documentation.
- Students viewed PA positively and reported peer feedback as useful.

This is the initial stage of a wider review of assessment strategies in this and similar programmes. To obtain a more thorough understanding of the experiences and perceptions of assessment, academics and students on this programme will be interviewed. The link between assessment and curriculum design coupled with the pedagogical reasoning for assessment choice will be analysed leading to the development of a structured framework for the inclusion of PA in these programmes.

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Appendix A**Sample of Staff Survey Questions.**

Thank you for taking the time to complete this short survey regarding assessment methods in Medical Science. The survey should take no more than 4 minutes to complete

How long have you been involved in the education of Medical Scientists?

- less than 1 year
- 1-5 years
- 6-10 years
- greater than 10 years

How many modules in the Medical Science programme are you involved in?

- 1
- 2
- 3
- 4
- 5
- >5

Please indicate the assessment methods that you use in these modules:

- MCQ
- Quiz
- Essay
- Short Answer Questions
- Case Study
- Problem Sheets
- Report Writing
- Abstract / Scientific paper review/writing
- Poster
- Group projects
- Presentations
- Other (please specify)



Do you use Peer Assessment in any of your modules?

- Yes
- No

At what stage of the programme do you use Peer Assessment?

- Stage 1 only
- Stage 2 only
- Stage 3 only
- Stage 4 only
- 1 Stage (please specify)

A solid black rectangular box used to redact information.

Can you briefly describe the Peer Assessment activity you employ?

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When you use Peer Assessment is it?

- As a form of formative assessment only i.e. no marks are attached to the activity
- As part of a group activity to adjust individual marks
- Used to compare students' marks to that of the lecturer

I agree to allow this information be used as part of research study into assessment methodology in Medical Science.

- Yes

Appendix B**Sample of Student Survey Questions.**

Are you?

- Male
 Female

What year of the Medical Science programme are you in?

- Year 1
 Year 2
 Year 3
 Year 4

How would you describe your overall attendance at college?

- I miss class / lab only when I am sick (>90 % attendance)
 I attend most classes and all labs (60-90%)
 I attend most classes and most labs (40- 60%)
 I don't have very good attendance at classes / labs. (<40%)

During your time in Medical Science what assessment methods have you experienced?

- Quiz
 MCQ
 Short Answer questions
 Essay
 Poster
 Group Project
 Problem Sheets
 Presentations
 Case Study
 Report Writing
 Abstract writing
 Other:

Have you ever carried out a Peer Assessment activity?

Mark only one oval.

- Yes
 No

What was the Peer Assessment activity(ies) that you took part in?

What did you like about Peer Assessment?

What did you not like about Peer Assessment?

Did you receive feedback from your peers?

- Yes
 No

Did you find the peer feedback useful?

- Yes
 No

Why did you or why did you not find peer feedback useful?

I agree to allow this information be used as part of a research study into assessment methodology in Medical Science.

Thank You

- Agree