Peer assessment in Irish medical science education: Exploring staff assessment literacy and assessment practice

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Abstract
The approach to, and the type of, assessment(s) that a Higher Education (HE) programme employs can be key factors in the effectiveness of assessment as a tool of learning. Peer assessment (PA) has the potential to develop the evaluative competence of students in HE. In the Republic of Ireland (RoI) there are three Institutes that each deliver a professionally validated honours degree programme in Medical /Biomedical Science. The aim of this paper is to report on the experiences and views of the academic staff involved in these three programmes with respect to assessment. Presented here is one aspect of a larger study into assessment practices in the education of Irish Medical Scientists with the overall aim being the development of a framework for the structured inclusion of PA. An insight into the current practices, experiences and views of staff is an essential step in the development of an effective framework. All academic staff (n=80) involved in the three programmes were invited to complete an online anonymous survey. Employing a mixed methods design, the survey incorporated closed questions e.g. subject area, years of experience and formal teaching qualifications, and open questions including staff's understanding of the terminology of assessment, if they use PA, their reasons for choosing PA and any challenges they may have encountered. Thirty-five staff responded to the survey; all three institutes were represented. The thematic analysis of the qualitative data demonstrated that staff generally see assessment as a 'measure' (grade or mark) of understanding and knowledge. The distinction between formative and summative assessment was not clear for all staff; 19/33 staff described summative assessment as an 'end of module' exam and 13/33 staff referred to formative assessment as being 'continuous' or 'ongoing'. There was clear evidence of a lack of use of terms associated with assessment; such as 'assessment as, of and for learning'. Eleven of the respondents use PA in their module(s), they reported the positives and challenges of PA as they experienced e.g. increased student engagement, importance of student preparation. The results of this study confirm the need for, and provides a justification of, building a best practice framework for PA in HE Medical Science education in RoI.

Introduction and Study Context
The link between assessment and learning has been well documented by many researchers (Carless, 2014; Race, 2014; Carless and Zhou, 2015). The approach a programme takes to assessment plays a key role in the learning that occurs during the period of study. It is recommended that assessment 'of, for and as' learning be part of a programme's assessment strategy leading to the development of independent self-directed learners (National Forum for the Enhancement of Teaching and Learning in Higher Education, 2017a). One way that assessment 'for' and 'as' learning can be increased in a programme is to include peer assessment (PA) as part of the assessment strategy. In the context of this paper PA is defined as

Citation
McGrath, M., Scott, L., Logue, P. (2020) 'Peer assessment in Irish medical science education: Exploring staff assessment literacy and assessment practice', *Practitioner Research in Higher Education Journal*, 13(2), pp. 37-56.

students judging and make decisions about the work of others, which is aligned to the definition by Adachi *et al.* (2018). Assessment is used in the broadest of terms i.e. making a decision about the value of work and note that this decision does not always involve assigning a mark. In professional practice there is an expectation that employees have the skills and competency to make judgements about their own and the work of others; PA can assist in the development of these skills (Tai *et al.*, 2017).

Building on earlier exploratory research, presented here are the experiences and views of educators, from three different institutions, with respect to assessment. These institutions are involved in the education of Medical Scientists in the Republic of Ireland. Each of these institutions deliver a professionally accredited B.Sc. (Hons) programme that graduate Medical Science professionals. These graduates are employed primarily in clinical laboratories performing the analysis of clinical samples that aid the diagnosis and treatment of patients. Since March 2019 Medical Science has become a CORU[1] registered profession. The assessment strategy of the educational institutes is required to be aligned with the standards of proficiency published by CORU (CORU, 2019b). PA allows students to develop skills in evaluation, communication and problem solving, some of the skills that are required by CORU of graduates entering the profession (Adachi *et al.*, 2018; Tai and Adachi, 2019). Previous research in the area of medical science education showed that students felt PA facilitated learning and increased engagement (Mc Grath *et al.*, 2017).

Presented here is one aspect of a larger study into assessment practices in the education of Irish Medical Scientists with the overall aim being the development of a framework for the structured inclusion of PA. Therefore, the main aim of this paper is to explore the assessment literacy and assessment practice of academic staff across the three institutions in RoI delivering these programmes.
The two objectives being:

- To gain an insight into the understanding by academic staff of the terminology associated with assessment.
- To explore the assessment practice of academic staff, to determine the inclusion of PA and to establish the experiences of the staff that use PA in these programmes.

Methodologically, data collection involved all staff on the three programmes engaged in the delivery of undergraduate modules during 2017-2018 (n=80) being invited to complete an anonymous online questionnaire. Both qualitative and quantitative data were collected and analysed, a distillation of these findings are presented here.

There is little published in the area of Medical Science education in Ireland and this study will serve to bridge that gap by establishing the current context of assessment in these programmes, from the staff perspective, and will inform the design of a framework for the structured inclusion of PA. This paper reports on staff's understanding of the terminology of assessment and whether they include PA as part of their assessment strategy. The experiences of the staff that use PA are also reported. Following this introduction, the paper presents a review of assessment in Higher Education (HE), the research methodology is outlined followed by the findings, analysis, discussion and conclusion of the study.

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[1] CORU is the Irish state registration body for Health & Social Care Professionals. It comes from the Irish word for fairness – cóir.

Assessment in Higher Education

A review of the literature in the area of assessment in HE identifies several themes with respect to effective assessment practice and implementation of change. This section includes a brief analysis of the literature in relation to programmatic approach to assessment including formative methodology and an emphasis on 'assessment as and for learning'. The barriers and enablers of practice change are identified. The importance of effective feedback including the assessment literacy of all stakeholders are also presented (Winstone *et al.*, 2017; Carless and Boud, 2018).

A programmatic approach to assessment offers several advantages to both students and staff, resulting in an increased emphasis on 'learning' and less focus on the attainment of grades (Jessop and Tomas, 2017). To support students in meeting the Learning Outcomes (LO) and the professional competencies required, a structured programmatic approach to assessment including a balance between summative and formative assessment is required (CORU, 2019a). The horizontal and vertical integration of assessment can allow a balance of assessment of, for and as learning to occur as outlined by the National Forum for the Enhancement of Teaching and Learning in Higher Education (2017b).

The inclusion of more formative assessment will help balance the assessment 'as' and 'for' learning with the assessment 'of' learning (Gibbs *et al.*, 2003). Using PA is one way that this can be achieved. PA allows students to judge the work of others and offer some feedback on its value increasing the development of collaborative learners and critical thinkers (Adachi *et al.*, 2018).   The inclusion of PA has been shown to offer a number of advantages to students however it is also important to note that it is not without challenges (Adachi *et al.*, 2018). Students generally report positive experiences of PA and report that it assisted in their 'learning' (Mulder *et al.*, 2014; Mc Grath *et al.*, 2017; Li *et al.*, 2019). A previous study, of one of the programmes being reported on here, demonstrated that students felt that they benefited from PA but that there were some aspects that they viewed negatively (Mc Grath *et al.*, 2017). While the student voice is prominent in the literature there is not as much published in the area of the staff experiences with respect to PA (Adachi *et al.*, 2018). There is a dearth in the literature with respect to Irish medical science education that this paper is serving to address.

Student surveys generally demonstrate that students are unhappy with feedback and with some aspects of programme assessment strategies such as the timing of feedback or the clarity of assessment criteria. (Carless and Boud, 2018; ISSE, 2018; Deeley *et al.*, 2019). Previously, we reported on the students' experiences of feedback and assessment from these three programmes (Mc Grath *et al.*, 2019). Our findings were in line with other studies and demonstrated a gap between student expectations and practice. Student dissatisfaction has been a key driver of research and practice change in the area. There are several factors that can influence academics to initiate change in their assessment practice. Bearmann *et al* (2017) demonstrated that professional and environmental influences played a key role in how educators designed their assessments. Staff assessment literacy and a shared understanding of the terms of assessment are key to a successful assessment strategy (Davies and Taras, 2016).

How and why academics choose assessment design is complex and not solely (if at all) informed by pedagogical theory. Bearman (2017) outlines the necessity to bridge the gap from assessment theory to practice. Successful innovation in assessment is related to institutional support (Bearman 2017). However as academics are responsible for assessment, small changes can be effective in improving learning (Carless and Zhou, 2015). From earlier analysis of the programme documentation the programmes being reported on here are teaching intensive with a strong emphasis on summative assessment. Identification of the staff views on the implementation of PA in these institutes provides the underpinning knowledge

for the development of a framework for a more structured inclusion of PA (Panadero and Brown, 2017; Adachi *et al.*, 2018).

A key element of effective formative assessment is the feedback that students receive (Pitt and Norton, 2017). Due to the importance of assessment and feedback in student learning, it is important that attention should be paid to the design, execution and timing of all assessment activities within a module and a programme, so that students will receive timely, effective feedback that can have a feedforward effect (Scott and Fortune, 2013). In PA students not only judge the work of their peers, they also provide feedback, Mulder *et al* (2014) described the unexpected learning taking place when students write reviews as part of a PA activity. PA can assist in developing the students into reviewers and in delivering effective feedback to their peers (Nicol *et al.*, 2014).

The assessment and feedback literacy of stakeholders can be one barrier to the implementation of effective feedback. Carless and Boud (2018) outline a conceptual framework to improve student feedback literacy so that students can utilize feedback. Winstone and Nash (2017) discuss the shared responsibility in the engagement and subsequent application of feedback, noting the importance of feedback having a 'feed forward' effect. Forsyth *et al* (2015) demonstrated the variation in staff perceptions of assessment practice and introduced an initiative to support staff assessment literacy as a way of supporting change and innovation in assessment. McDowell *et al* (2009) also refer to the confusion that exists regarding assessment terminology. This was evident when the students of the three programmes under investigation here were questioned regarding their awareness of terms associated with assessment (Mc Grath *et al.*, 2017; Mc Grath *et al.*, 2019).

The analysis of the literature demonstrates that assessment and feedback are complex in nature. An insight into current practice and experiences of stakeholders on these programmes will provide the evidence on which a framework for the structured inclusion of PA can be based. The following section outlines the data collection methodology and methods employed in this study.

Data Collection

Having received ethical approval with respect to all three institutions, all academic staff on the programmes were invited to complete an anonymous online survey. Using Google forms, the survey was emailed to all academic staff involved in the three undergraduate programmes, inviting their participation. The main objectives of the staff survey were to determine the academic staff's understanding of the terminology of assessment, if they use PA and what their experiences in relation to PA are. The survey can be reviewed in Appendix A. Overall a mixed methods approach was adopted for this study with both quantitative and qualitative data being recorded (Tashakkori and Teddlie, 2010). Thematic analysis of the qualitative data was carried out based on Braun and Clark's approach (2006) with the assistance of NVivo 11 software. Excel Office 365(Online) was used in the analysis of the quantitative data.

The survey is divided into various sections, the opening section asked general demographic questions, number of years of experience in the education of medical scientists, main discipline area on the programme and if they have a qualification in teaching, learning and assessment (TL&A). In the next section and in order to explore the assessment literacy of the staff, respondents were asked to explain what 'assessment' means to them and what they understood 'formative' and 'summative' assessment to mean. Quantitative data was also collected on staff views as to whether there is a programmatic approach to assessment in their institution, if their institute supports innovation in assessment and if there is culture of innovation and improvement in assessment.

Academics were asked to report on the assessment methods they currently use and if they use PA in this specific programme. If PA is used the survey continues to determine how this is used, at what stage of the programme, the reasons for choosing and what the academics view as the advantages and disadvantages of PA. The use of PA as a form of summative assessment is also investigated.

Data Findings
The following is a distillation of the main findings from the survey responses. A deeper analysis of the findings is presented in the 'Findings' section of this paper. The survey contained both open and closed questions (Appendix A).   The first section of the survey provided some demographic data on the respondents including: years of experience, teaching qualifications, main subject area. The main body of the survey captured the views of the respondents in relation to assessment; their definition of the terms associated with assessment, the types of assessment they use, if they use PA – why, in what way and what their experiences of PA have been. The views of the respondents regarding their institution's approach to assessment were also captured.

Survey Respondent Demographics
Thirty-five staff across the three institutions completed the survey, 51.4% of respondents have greater than 10 years' experience of involvement in these programmes and 34% have 1-5 years' experience. Table 1 below presents details of the respondents' years of involvement in the education of medical scientists, the number of modules they are involved in and the details of the respondents' qualifications in TL&A.
There was a wide variation in the respondents' main subject area, representing a wide and deep knowledge of these programmes. Of the 18 staff that have a qualification in TL&A there was a variation in the years of experience, 9 have greater than 10 years of experience, 7 have between 1 and 5 years and 2 have 6-10 years' experience.

Table 1. Survey respondents' demographics (n=35).

Years of experience in Medical Scientist undergraduate education			
	Number of years	Number of respondents	%
Years of Experience as part of this programme	Greater than 10	18	51.4
	6-10	12	34.3
	1-5	5	14.3
Number of modules respondents are involved in on the programme			
	Number of modules	Number of respondents	%
Number of modules involved in on the programme	1	10	29.4
	2	6	17.6
	3	6	17.6
	4	2	5.9
	5	2	5.9
	Greater than 5	8	23.5
Details of staff qualifications in TL&A			
	Number of respondents	Number with a teaching, learning and assessment qualification	Details of qualification
Teaching, learning and assessment (TL&A) qualification	25 staff responded to question	18 (12/18 respondents gave details)	PhD – 1 Masters – 2 PG Diploma -6 Higher Diploma – 1 PG certificate – 1 Adult education course -1 (unsure of accreditation)
Module in Assessment completed		11/18 that have completed a TL&A qualification reported completing a specific module on assessment	

Staff reported on using diverse methods of assessment in their modules as displayed in Figure 1 below. The assessment method used by 94% of staff was 'Final Exam' indicating a strong presence of summative assessment on these programmes. Short answer questions (SAQ), Multiple Choice Questions (MCQ) and reports are each used by over 60% of staff. The least frequent assessment methods reported were scientific paper writing, other, poster and essay writing.
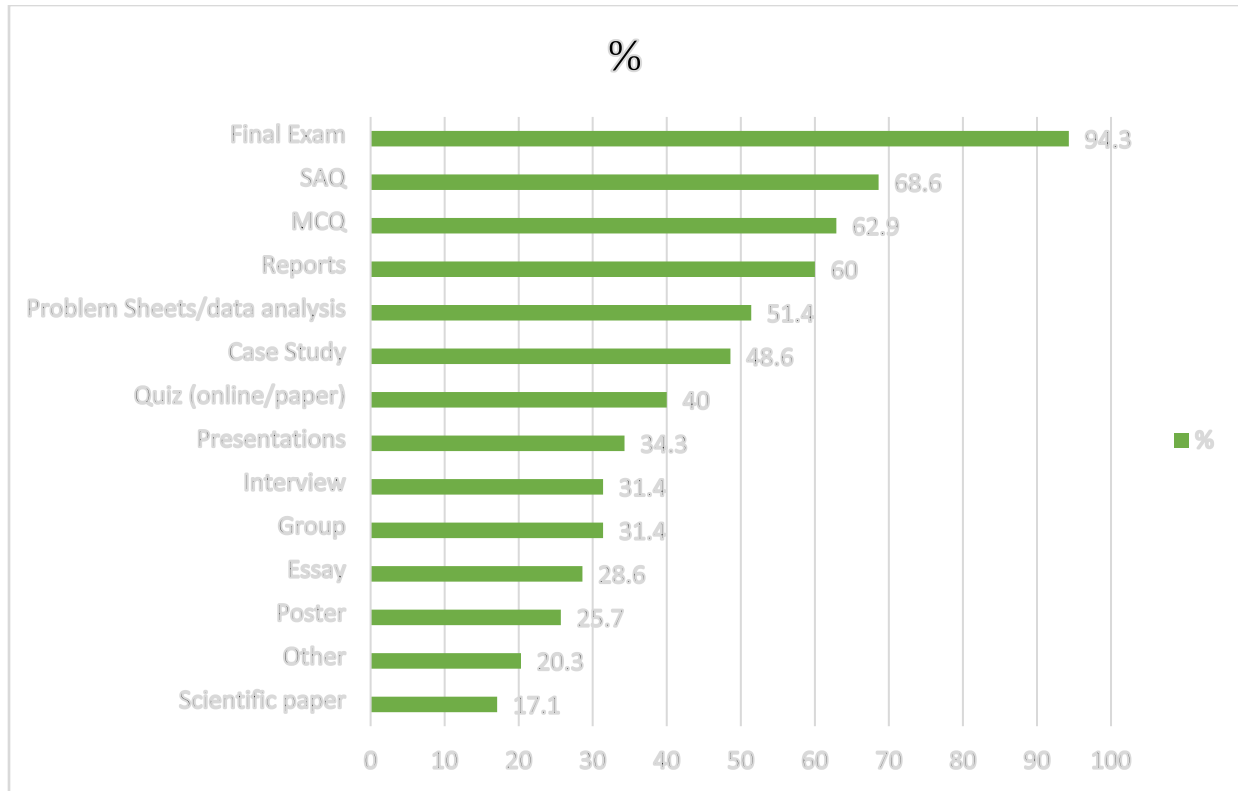
Figure 1. The % of staff reporting use of specific assessment methods.

Staff were asked if they were familiar with their institution's policy on assessment and if they agreed that there is a programmatic approach to assessment in the programme for Medical Scientists that they are involved in, the results are presented in Fig 2.
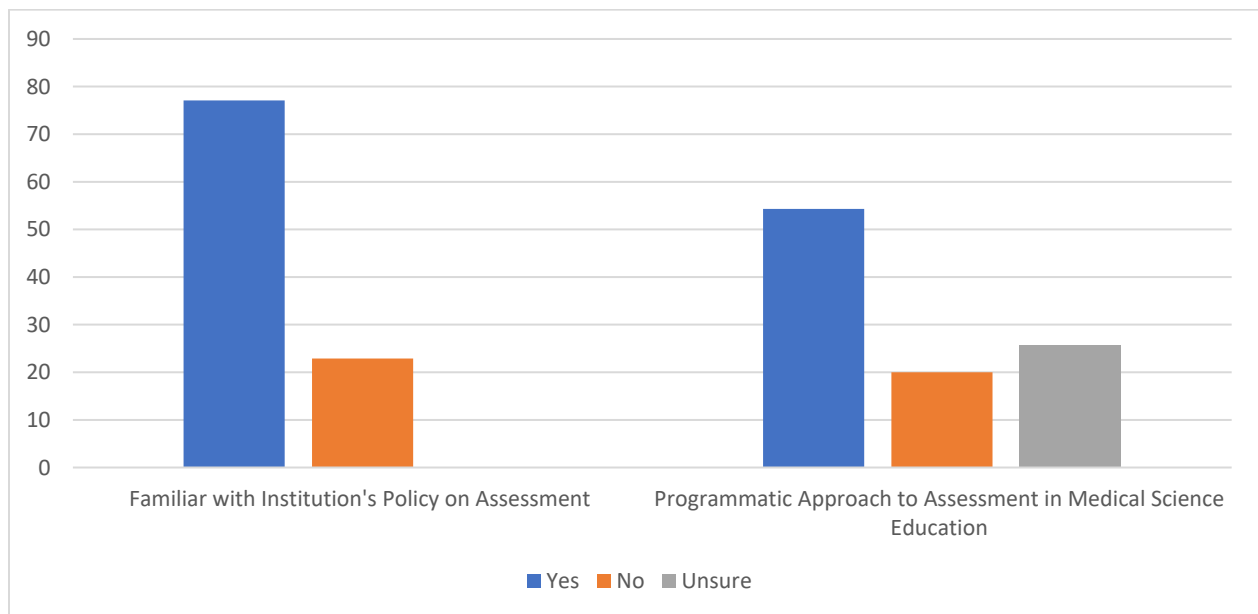

Figure 2. Assessment Policy and Programmatic Assessment: staff responses.

Figure 2. demonstrates that there was a high % (77%) of respondents that were familiar with their institute's policy documentation on assessment. For the 23% that were not familiar all three institutions were represented. When asked if there is a programmatic approach to assessment in these programmes 54% (n=19) answered 'Yes', 20% (n=7) 'No' and 26% (n=9) answered Unsure (Fig 2); the 16 (46%) staff that answered 'No' or 'Unsure' are from the three institutions, have varied experience and the group contains staff that have completed a TL&A qualification (8/16) with 5/16 having completed a specific module in Assessment. All 3 institutions are represented by the 19 staff that answered 'Yes'.

Staff were also asked to express their view on 2 statements regarding their institution and innovation in assessment. Selecting from a scale ranging from strongly agree to strongly disagree staff expressed a view on whether there is a culture in their institution of encouragement when it comes to assessment and if they felt that their institution's policies support innovation in TL&A, results are presented in Fig.3.
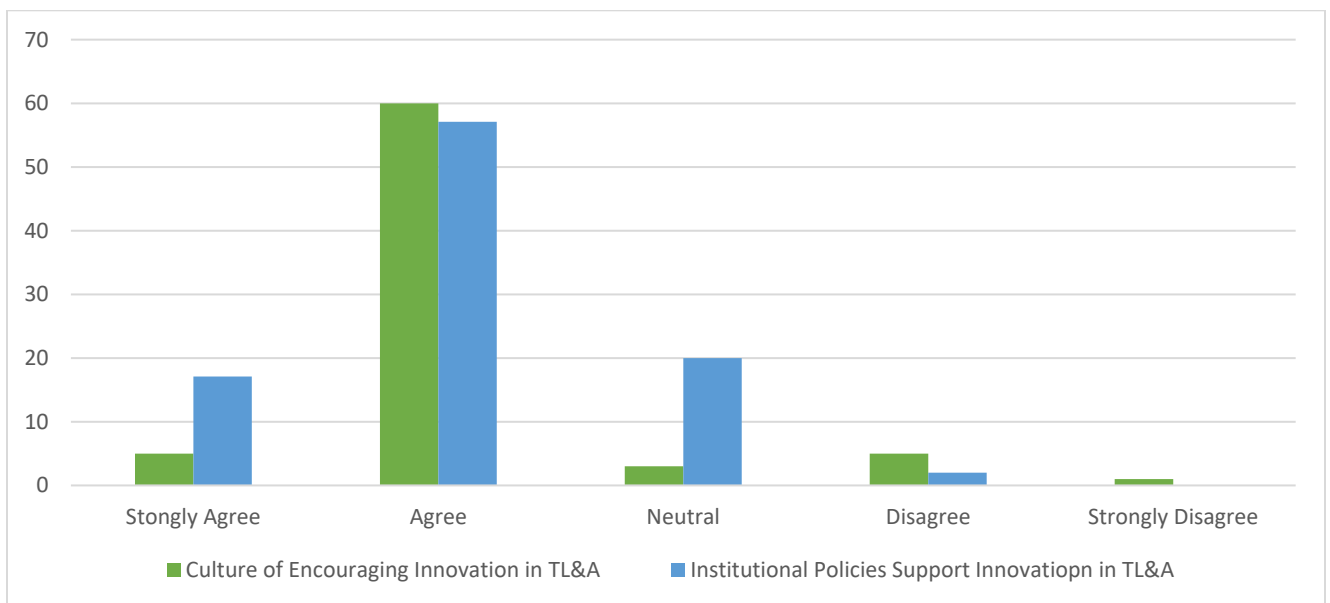

Figure 3. TL&A Culture and Policies: Staff responses.

Generally, as can be seen in Figure 3 respondents responded positively regarding the culture in their institutions in encouraging and supporting innovation in assessment with the majority, 26/35 (74%) of staff either agreeing or strongly agreeing with this statement. One member of staff 'strongly disagreed' with the statement; they have 1-5 years' experience and do not teach a core Medical Science subject, this respondent is not in line with other staff, which could be due to their limited HE experience and limited involvement in the programme. There was also 74% of staff agreeing or strongly agreeing that there is a support in the institutional policies to be innovative in teaching, learning and assessment. Seven (20%) were 'Neutral' on this and 5 of these were from one institution.

The findings outlined above demonstrate the demographics of the staff and their views on the current landscape of assessment in both their specific programme and specific

institution. The main body of the survey contained questions regarding the staff's own understanding of the terminology of assessment (Objective #1) and the use of PA in the programme (Objective #2), the

findings of which are presented in the next section and analysed in the 'Analysis and discussion' section of this paper.

Findings addressing staff understanding of terminology of assessment (Objective #1).
The following are the findings establishing the assessment literacy of the staff. Firstly, staff were asked to "briefly explain what you understand assessment to mean". Twenty-three staff (66%) completed this question, 12 (34%) respondents chose not to answer. Assessment was primarily described as a means of measuring' students' knowledge, "*methods to measure student learning*" or understanding "*assessment ensures that the learning objectives have been met*", "*testing to see whether an individual's understanding of a topic, or ability to perform a task, meets a specific predetermined standard*". Assessment 'of' learning was a key theme seen in the data. Some staff referred to assessment criteria and the role of measuring skills and competencies. Overall the summative application of assessment was clearly visible in the responses with one respondent explaining assessment as "*how we determine what the students have learned*"

The role of assessment as a tool of learning was not clearly obvious from the descriptions of assessment given. Below are two quotes demonstrating a minority of staff have a clear understanding of the role of assessment in the learning process, both quotes are taken from staff that have post graduate qualifications in TL&A:

> I like to see my role as setting up victories for the students and the assessment is the opportunity to show themselves how much they have achieved. I also believe it is important to get things wrong and learn from mistakes and assessments are also a great opportunity for this

> The title of my module in teaching and learning explained it well - assessment for learning - and I understand assessment in its best form to contain formative as well as summative elements, from which the student can learn

There is a wide spectrum of understanding of the role of assessment by the staff respondents, ranging from some staff not answering the question outlining their understanding of assessment to some very articulate in their description, as shown above.

When asked to explain their understanding of the terms 'formative and summative assessment' the findings demonstrated that some confusion exists. For the 33 staff that answered these questions, there was an association between the meaning of the term and the timing of when the activity occurred. Summative was described as 'end of module' by 19/33 staff and 13/33 staff referred to formative assessment as being "*continuous*" or "*assessment during the module*", "*continuous assessment with feedback*" being examples of answers to this question.

The role of feedback was a strong theme seen in the staff understandings of formative assessment. Some of the staff that reported having completed a TL&A qualification used language linking assessment with learning and stressing the role of feedback as demonstrated by the following response: "*student progress on a particular learning goal is determined, feedback gives student a sense of their progress and guides students on methods/strategies on how to improve their learning. The assessment is for learning*". This is one of only three staff that referred to 'assessment for learning' when describing formative assessment.

Predominately formative assessment was seen as ungraded work and has a role in offering feedback for students to improve. As one participant put it *"formative assessment is assessment with no grading/marks allocated to it that contribute to the overall result for the module"*.

The role of formative assessment being used to inform and direct the activity of the lecturer was also seen in a small number of replies (n=4). The following two responses demonstrate how these staff use their formative assessment approach to adapt their teaching in a way to support student learning:

> Assessment such as presentation completed during a module to allow feedback to inform future teaching

> Tailoring teaching styles to make sure students are keeping up with learning material as you go through a module, or continuous assessment

Staff predominantly described summative assessment as assessment that is graded, like formative assessment there was also an association with the definition of the term and the timing of the activity *'summative assessments are usually formal assessments that contribute to the final grade and ensure learning outcomes have been met'; 'assessment carried out when the module is completed'*, *'assessment to rank or grade students'*. It is evident that there is a need for clarity and consistency on the meaning of these terms. The following section of the paper presents the findings in relation to the use of PA by the respondents.

Findings establishing the inclusion of PA in these programmes and the experiences of the staff that use PA (Objective #2).
Eleven of the respondents use PA with their students. One respondent referred to PA in relation to their own work not to assessment of students, this response was omitted from analysis. PA is used for presentations, reports, group work, math's journals, MCQ. One staff member reported using a software programme (Peerwise) allowing students to build and review MCQs. Overall PA is being used in the lower years of the programme with only one of the respondents stating that they use PA with final year students. The cited reasons for the inclusion of PA was to increase student engagement and participation in group activity; to increase students' awareness of assessment/marking criteria; the development of the learning resulting from generation of feedback, the opportunity for students to learn from each other. One staff member specifically commented on 'formative and self-reflective development' as a reason for including this assessment activity. Ten of the eleven staff that employ PA assign a mark to the activity, marks are given for participation or combined with staff marks to compile an overall mark.

The main positives of PA reported by staff was in agreement with the reasons they had given for introducing PA such as; increasing student engagement, "encourages engagement, ownership and reflection of the learning"; increasing students' awareness of criteria *"…marking criteria inform student of relative …transparent marking, once there is clear criteria"* and "*the students get to see how marks are allocated and the need to pay attention to each element of the assignment when they are completing future assignments themselves*" and the self-directed learning that can occur, *"there is both a learning and assessment aspect"*

Challenges that staff reported with PA included gaining student 'buy-in' *"the student may not always see the value in it straight away and see it as 'extra work' that isn't worth anything if not graded"*, issues that can arise when the activity is not anonymous and issues with trust in assigning marks "*nervous students may be intimidated by peers. There is always a risk of bullying even at third level"*, and the time or effort

needed to prepare for the activity to be a success. Below are examples of the challenges that two academics expressed in relation to PA:

> Students' judgement on achievement of the criteria can be skewed; sometimes students can't discriminate and award everyone the same mark. Peer pressure from friends to give better marks or a willingness to be liked by classmates. In a group scenario one member can become targeted. Students want an expert to grade their work and feel cheated by being judged by peers.

> No real disadvantage but takes a little practice and training to set up the templates and get students used to the process. Once the rules and process established it works very well as the students get feedback every two weeks and discuss their work with a peer.

The next section of the paper discusses these findings in relation to the literature and contains suggestions for further investigation.

Analysis and Discussion

Assessment is key to learning and the use of more formative assessment methods can assist in the development of self-regulated independent lifelong learners (Scott and Fortune, 2013; Carless, 2014; Race, 2014) . PA is one such formative method that has a role to play as an authentic assessment method (Kearney and Perkins, 2014). A programmatic approach to assessment offers the advantage of increased focus on learning and a move away from the 'grade' focus that exists in many HE institutions (Heeneman *et al.*, 2015). The results presented here are part of a larger study with the overall aim of developing a framework for the inclusion of this formative assessment in the undergraduate education of medical scientist professionals. For an effective framework to be developed it is necessary to establish the current status of assessment in these programmes.

To initiate effective change in a programme's assessment strategy there is a need for all stakeholders to be invested, Medland, (2016), describes the barriers and the enablers for assessment change in the UK. The National Student Survey (NSS) scores are a driver at institutional level to initiate a cultural shift from assessment 'as measurement' to the inclusion of assessment 'for and as' learning. Policies must be research informed and there needs to be clarity regarding the language and process of assessment. The professional development of the staff will be key to this change (Price *et al.*, 2012; Medland, 2016). Therefore, in the development of a change framework it is of interest to establish the current situation. The results presented here document the assessment literacy of the respondents and the experience of those that have implemented PA. The experiences of students on these programmes has previously been published (Mc Grath *et al.*, 2017). The student perspective was very much 'grade oriented' when it came to assessment and there was evidence of a gap in student assessment literacy. This paper explores the assessment literacy of the academic staff and their assessment practice.

From the data the respondents represented a wide distribution of experience, subject area, and professional development qualifications in the area of TL&A (Table 1). Although there is evidence of diversity in assessment methods (Fig 1) there is an emphasis on the use of 'final exam' demonstrating the grade orientation that appears to exist in these programmes. These programmes are 'teaching intensive' and the grade orientation of staff (and students) aligns with previous findings (Tomas and Jessop, 2018).

With 18/35 staff (Table 1) having a qualification in teaching, learning and assessment; there is evidence of professional development in these programmes. This is an important enabler in the introduction of innovation in assessment, encouraging a move away from assessment 'of' learning and towards

assessment 'for and as' learning. There is room for improvement as there are an equal number of staff members that do not have a qualification.   In addition to staff development, institute polices and the culture that exists are also important supports in introducing change – as was described by Bearman (2017) and from the data reported here these are not seen as major barriers in these institutions (Fig 2. and Fig 3.) (Forum, 2016; Bearman *et al.*, 2017).

Objective #1 – To gain an insight into the understanding of terminology of assessment by the staff on the undergraduate Medical Science education programmes
Assessment literacy has been demonstrated to be a major influence on the success of an 'assessment as learning' strategy (Price *et al*., 2012; Forsyth *et al*., 2015; Davies and Taras, 2016) Staff and students must have a shared understanding of the language or the terminology of assessment. It cannot be taken for granted that both stakeholders are familiar with and have a similar understanding of the terms or the process of assessment. As demonstrated by McDowell *et al.* (2009) the understanding of the term 'assessment' and differentiation between formative and summative assessment causes confusion for academics and this cohort is no exception (Davies and Taras, 2016). The findings presented in the 'Findings' section of this paper show 23/35 staff responded to the question describing what assessment means to them (12 staff did not respond, the reasons for this may be that they were unclear or unable to clearly define the term). The main theme that emerged from this data was that assessment is seen as a *measure* of learning or knowledge, this is very much in line with the student perspective (Mc Grath *et al.*, 2017; Tomas and Jessop, 2018), the students' 'grade orientation' also appears to be the view held by staff. The role of assessment as a tool of learning is not obvious from the data, similar to the findings presented by Bearman (2017) there is an absence of the language of assessment. It is obvious that staff are using diverse assessment methods but the reason for this is not clear and will be researched deeper in staff interviews that will follow this phase of the study (McDowell *et al.*, 2009; National Forum for the Enhancement of Teaching and Learning in Higher Education, 2017c)

When defining formative assessment staff appear very aware of the role of feedback. Students in both the UK's NSS and the Irish Survey of Student Engagement (ISSE) have previously reported poor satisfaction with feedback (ISSE, 2018).   There appears to be a gap in the practice or with the students' satisfaction of the process, this may be due to lack of student feedback literacy or poor ineffective practice, it is planned to unpack this further in staff interviews (Mulliner and Tucker, 2017; Carless and Boud, 2018).

With respect to summative assessment, staff definitions of this term reinforced the definition of assessment 'of' learning. Generally, when discussing assessment there was an obvious lack of use of the terms 'assessment of, for and as learning'. In order to change the approach to assessment in any programme it will be necessary to restructure how we perceive assessment and how we discuss this with our students ensuring that all stakeholders have a common language with respect to assessment (Forsyth *et al.*, 2015; Medland, 2016).

Objective #2 - To establish the inclusion of PA in these programmes and the experiences of the staff that use PA
The use of PA has been widely reported as having many positive aspects in relation to student learning (Ashenafi, 2017; Li *et al.*, 2019). The findings presented in the 'Findings' section of this paper illustrates that PA is in use in these programmes but not in a very structured fashion, there is a mixture in the application and the activity is used mainly in the lower years of the programmes, similar to the literature (Orsmond and Maw, 2011). The reasons for using PA varied but were in line with previous publications (Adachi *et al.*, 2018). Although not all staff that use PA have a qualification in TL&A the reasons for introducing PA were in line with the advantages previously published, showing evidence that staff want

to encourage student engagement, one staff member mentioned the importance of students being aware of assessment criteria. Although staff do not directly refer to the literature or pedagogical theory their responses are aligned with same, similar to the findings presented by Bearman (2017).

One possible concern may be the use of PA as a summative tool, 10/11 staff use PA in a summative manner. In such a case the positive benefits of formative assessment may be lost. The evaluative skills developed from a PA activity align with CORU's professional standards of proficiency e.g. professional development, problem solving and effective communication. Use of PA as a summative tool could potentially enhance some of the negative aspects associated with PA, e.g. lack of trust in peers assigning marks and reinforce 'assessment of learning' and a 'grade orientation' view.

There is some work to be done to encourage more formative use of assessment and the inclusion of 'assessment as and for learning' in these programmes. The challenges associated with the successful implementation of PA reported by staff (Findings section of this paper) are also in line with the literature and will be used to inform the development of a framework for the more structured inclusion of PA (Ashenafi, 2017; Adachi *et al.*, 2018).

Conclusion
This paper reports on the experiences and views of the academic staff involved in the education of Medical Scientists in the RoI with respect to assessment.   The two main objectives of this paper were firstly, to gain an insight into the understanding of the terminology of assessment by the staff on the undergraduate Medical Science education programmes and secondly, to establish the inclusion of PA in these programmes and the experiences of the staff that use PA.

The data from this study demonstrates that there is a gap in the fluency of the staff with respect to the language of assessment and the use of 'assessment as and for learning' is not obvious. The academic staff of these programmes employ diverse assessment methods but predominately in a summative manner, this results in the focus of assessment as a measure 'of learning' and in the 'grade orientation' of both staff and students.

PA is in use though not in a cohesive or formative manner, there is not an obvious link between the use of PA and pedagogical theory. There is a need to clarify for all staff the meaning of the terminology of assessment and to outline a framework that can support student learning using more formative assessment such as PA. The staff believe they are supported by their respective institutions in introducing innovative assessment so the introduction of a framework for the structured inclusion of PA in a more formative manner would be expected to be supported in these institutions.

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Appendix A Staff Survey

Staff Survey - Biomedical Science Assessment Methodology
I would be very appreciative if you could complete this survey on assessment in Medical/Biomedical Science undergraduate education. The survey should take no longer than 10 minutes of your time. All responses are anonymous.
Thank You
Mary

1 I agree to allow this information be used as part of a research study into assessment methodology in undergraduate Medical Scientist education. I understand that my participation is voluntary and I can withdraw from the study at any time. *
Mark only one oval.
Agree

Demographical Information
2. In which educational institute are you part of the undergraduate Biomedical/Medical Science programme team?
Mark only one oval.
CIT/UCC
DIT
GMIT
Other:

3- How long have you been involved in the education of undergraduate Medical Scientists?
Mark only one oval.
less than 1 year
1 - 5 years
6-10 years
> 10 years

4. How many modules in the undergraduate Medical/Biomedical programme are you involved in? Mark only one oval.
1
2
3
4
5

5- What is your main subject area on the undergraduate programme?
Mark only one oval.
Blood Transfusion Science
Biochemistry
Biology
Cellular Pathology
Chemistry
Clinical Chemistry

Haematology
Immunology
MathslStats
Microbiology
Molecular Biology/Genetics
Physics
Other:

6. Do you have any formal qualifications in education {Teaching, Learning + Assessment)? *Mark on/y
one oval.*
Yes *Skip to question* 7.
No *Skip to question 9.*

Qualification in Teaching, Learning + Assessment.

7. Can you give brief details of your qualifications in education;

8. Did you complete a specific module on assessment / assessment practice? *Mark only one ova/.*
Yes
No

Assessment
9. Can you briefly explain what you understand 'Assessment. to mean.

**10. In your modules on the Medical/Biomedical Science undergraduate programme please indicate the
assessment methods that you use.**
Check all that apply
End of module exam
Multiple Choice Questions (MCQ)
Quiz (online / paper)
Short Answer Questions (SAQ)
Case Study
Problem Sheets/ Calculations / data analysis
Report Writing
Abstract/ Scientific paper writing
Poster presentation
Group project work
Presentation
Essay
Interview/Oral examination
Other:

11. What do you understand 'formative assessment means?

12. What do you understand summative assessment means?

13. Do you use Peer Assessment in any modules? *Mark on/y one oval.*
Yes *Skip to question 14.*
No *Skip to question 21.*

Peer Assessment
14. How would you describe the Peer Assessment activity/activities that you use.

15. At what stage of the programme do you use Peer Assessment?
Check all that apply
Stage 1 only
Stage 2 only
 Stage 3 only
Stage 4 only
> 1 stage - please give details below __ ___ Other:

16. Can you outline your reasons for choosing Peer Assessment as an assessment tool

17. Do you allocate marks to the Peer Assessment activity or it is a formative assessment only? ('Formative assessment only' is not included in module mark) *Mark only one oval.*
Formative only *Skip to question 19.*
Marks are used *Skip to question 18.*

Peer Assessment Marks
18. Can you describe how you allocate marks to the Peer Assessment activity?

Peer Assessment Continued
19. In your opinion what are the advantage(s) of Peer Assessment?

20. What would you describe as the disadvantage(s) of Peer Assessment?

**Please answer these last few general questions on assessment in
your institution:**

21. In the Medical/ Biomedical Science undergraduate programme there is a programmatic approach to assessment.
Mark only one oval.
Yes
No
Unsure

22. Are you familiar with your institution's policy on assessment and assessment strategy?
Mark only one oval.
Yes
No

23. There is a culture of encouraging innovation in **assessment and teaching. Do you:**
Strongly disagree
Disagree
Neutral
Agree
Strongly agree

24. Your institutional policies support innovation in teaching, learning and assessment. Do you:
Strongly disagree
Disagree
Neutral
Agree
Strongly agree

25. Thank you so much for taking the time to complete this survey, I really appreciate your input and if you would be interested in discussing assessment in medical science further please submit your email address here, alternatively you can email me directly -mary.mcgrath@gmit.ie (Email addresses submitted here will not be linked to survey responses to ensure your anonymity) Thank You