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Is Reflective Writing an Effective Peer Assessment tool for Students in Higher Education?

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Abstract— **Today the ability to monitor and evaluate the performance of team members and identify their strengths and weaknesses is highly crucial in any organizational role. Higher Education Institutes (HEIs) are adopting different strategies in their teaching curricula and assessment methods to encourage the development of team management skills among graduates, one of which is peer assessment. It is an important component in the design of an effective learning environment in Higher Education (HE) and for promoting a strong participatory and collaborative culture among students. It provides students with a platform to not only engage with the HE learning process but also to learn from each other by receiving and giving critical feedback. Reflective writing in HE offers a flexible platform for students to discuss the contributions made by peers in teamwork however, not many researchers have looked at its potential as a peer assessment tool. This study addresses this gap by using the case study of the MSc Engineering Management (EM) programme at York (UK). Using the method of content analysis, this study looks at the quality of peer assessment and the skills gap analysis demonstrated in the reflective assignments students undertake in one of the modules. The findings show the viability and potential of this method for building peer assessment skills. It eliminates some of the limitations like bias among students usually encountered in other peer assessment tools. It also helps in skills gap analysis and for understanding group dynamics in teamwork. Students should therefore, be encouraged to seek the application of such tools for skills analysis, to build up confidence in peer assessment and boosting employability factors.**

Keywords— Peer Assessment, Higher Education, Reflective Writing, Teamwork, Employability

I. INTRODUCTION

Today, HE is placing a strong emphasis on the development of collaborative and team management skills among students. According to Gatfield [1, pg 365], teamwork plays "*an important part in the development and elaboration of personality*…" among students as it provides a powerful context for learning and developing a wide range of transferable skills. Vickerman [2] explains how peer interaction of any form can help students with their academic and self-development both from cognitive as well as emotional perspectives. It can help students develop their decision making and collaborative capabilities as they are exposed to multiple perspectives, strategies and sometimes conflicting views and arguments among group members. This skill is also highly sought after in the jobs market. "*Teamwork is a high priority for most graduate recruiters*" confirms one of the leading job recruiters in the UK [3]. Dunne and Rawlins [4, pg 361] note, "*Teamwork is becoming increasingly important within higher education, not only because of employer demands but also as a consequence of pragmatic requirements for change due to the increase in intake of students*".

As part of managing teams and understanding group dynamics, it is highly crucial for students to have an ability to monitor and evaluate the performance of team members and identify their strengths and weaknesses. However, for academics, assessing such aspects in group works or giving feedback to students on their individual contributions and engagement in teamwork might be a challenge. Raban and Litchfield [5] highlight "*The subject coordinator has limited opportunities to observe and assess the complex group and teamwork dynamics that are taking place*". These are some of the prevailing limitations with the assessment of group works in HE. So, how can academics address these issues? Johnston and Miles [6] recommend using peer assessment as a strategy to understand group dynamics in teamwork assignments. Reflective writing offers a flexible platform for students to discuss the contributions made by peers in teamwork however, not many researchers have looked at its potential as a peer assessment tool. Is reflective writing a reliable and effective tool for peer assessment in HE? Can reflective writing address the key issues usually associated with other peer assessment methods? This paper investigates these areas by looking at the viability of reflective writing as a peer assessment tool.

II. PEER ASSESSMENT

Peer Assessment is a formative or summative platform for students to give feedback on the performance and quality of works of other students within the same cohort. Topping [7, pg 20] describes it as an "*arrangement for learners to consider and specify the level, value, or quality of a product or performance of other equal-status learners*". In HE, peer assessment is an important component for the design of an effective learning environment. It promotes a strong participatory and collaborative culture among students and provides them with a platform to not only engage with the learning process but also to learn from each other by receiving

and giving critical feedback. One of the advantages of peer assessment as Liu and Carless [8, pg 287] observe is that students engage "*more actively with the identification of standards and the criteria representing these standards*". Many researchers have also discussed how engagement with peer assessment can increase motivation among students. Topping [7] explains that students will feel an enhanced sense of ownership by taking assessment responsibility which is a serious academic activity. For Spiller [9], it boosts students' status in the learning process by encouraging some control over their own learning. It will develop a wide range of skills in the areas of critical evaluation and analysis [10-11]. Topping et al [12, pg 151] summarize "*… peer assessment might increase a range of social and communication skills, including negotiation skills and diplomacy, verbal communication skills, giving and accepting criticism, justifying one's position and assessing suggestions objectively*".

Today given the complexity in organizational culture where teamwork is highly emphasized, several researchers are now associating peer assessment as an employability skill that HE needs to develop among students. Cassidy [13] in this context adds, "*Student peer assessment is one example of educational practice which is likely to contribute positively towards the development of employability skills*" (pg 509). For Boud [14], peer assessment and learning contributes towards lifelong learning. The relevance of peer assessment within an organizational context is also drawn by Raban and Litchfield [5] who observe "*The ability to assess the work of others is a core attribute for most professionals*" (pg 34). The authors therefore, stress the engagement of students with peer evaluation, self-learning, feedback and critical review further adding "*These are skills every professional should possess and be able to use for different purposes. It is also important for the novice professional to experience being on the receiving end of peer reviews and assessment, and to learn to benefit from any feedback received*" (pg 35).

There are different forms of peer assessment methods used in HE with rubric and standard marking sheets being the most popular. Researchers however, have questioned the reliability and effectiveness of some of these peer assessment approaches. Many argue students to be novice peer assessors given their limited experience [13]. Some highlight that students see assessment as a responsibility of academics and therefore, may not place the same emphasis as academics [8]. There is also the possibility of showing bias towards close friends or peers during marking. Gennip et al [10] note "*…students feel uncomfortable criticizing each other's work, or find it difficult to rate their peers*". For Cassidy [13], lack of formal training, being uncomfortable with the feeling of power, confidentiality or lacking the capability to properly assess are some of the other issues with students engaging with peer assessment. But researchers like Liu and Carless [8] and Orsmond et al [15] believe that with time, experience and support, students can overcome some of these issues and build up more confidence with their engagement with peer assessment. To engage students actively with peer assessment, HE needs to create a collaborative environment and offer opportunities to gradually build up the confidence and skills needed to review and critique peers and offer constructive feedback. One such flexible yet untapped platform for building peer assessment skills is reflective writing.

III. RESEARCH METHODOLOGY

Reflective writing can enhance professional learning and growth among students as reported by Schon [16], Rogers [17] and Hume [18]. According to Baruah et al [19] students' critical reflection of teamwork activities can give academics a window to understand the team dynamics and the contribution and engagement of different members. So far, the effectiveness of reflective writing as a peer assessment tool has not been explored. Can this method eliminate the issues such as student bias usually encountered with the other forms of peer assessments? This study addresses this gap by using the case study of a module called 'Enterprise' in the MSc Engineering Management (EM) programme at York (UK). This module is delivered during the spring term of the programme and teamwork is strongly emphasis in the learning objectives.

For the academic year 2016-2017, 48 students participated in this module. One of the assessments of this module is a peer assessment exercise based on a reflective report. This study reviews these reflective reports of the students from this cohort. Any identifiable personal data from the reflective reports of the students were anonymized using numeric codes and the word documents were imported into NVivo 11 which is a popular software for coding textual data. Content analysis is an established and comprehensive method for exploring and evaluating patterns and trends in large amounts of textual information and making valid inferences [20-21]. Using this method of content analysis, this study looks at the quality of peer assessment and the skills gap analysis among students in the reflective assignments. It also explores the viability of reflective writing as a peer assessment method. The effectiveness of this peer assessment approach is further investigated by interviewing a sample of 12 students chosen at random involved with the module.

IV. CASE PRESENTATION

The Engineering Management (EM) programme is a one year full time MSc course offered in the Department of Electronic Engineering at the University of York. This programme aims to provide students with a "*good understanding of the techniques and issues in modern engineering management, with an emphasis on those skills that will be immediately required in first line management roles*" [22]. A lot of emphasis is placed in developing employability skills such as "*creativity and innovation, capacity for analysis, problem formulation and solving, planning and time management, communications (written and oral), team working and interpersonal skills, research skills and activity management*" [22]. There are 10 core modules in the programme followed by a 60 credit final project. Peer

assessment is one of the learning objectives in this programme and students engage with this using rubric marking and reflective writing. 'Enterprise' - a 10 credit module which students undertake during the spring term is aimed at developing an understanding of commercial exploitation of a new product or technology. Teamwork is a big priority in this module. Students need to work in teams and investigate the marketing and financial viability of their business idea. The overall assessments in this module include a business pitch presentation which students need to deliver in their groups and is worth 25%. This is followed by a professional business plan - another group work weighting 50%. The final assessment is an individual reflective essay on peer assessment worth 25% of the module's assessment. For this reflective essay, students need to critically review the performance of their team and reflect on their group members' strengths and weaknesses, their roles and contributions towards the module's activities. As part of the peer assessment, they need to allocate each member a score out of 100 and justify the awarded scores in their reflections. The scoring from students in this module is formative and doesn't affect or influence the marks assigned by the module leaders.

A. Peer assessment depth and criticality among students

As part of peer assessment in the reflective reports, students identified and discussed a wide range of skills in order to allocate and justify marks for their team members. A lot of these skills reflected the level of engagement and responsibility undertaken by peers during the team activities in the module. Based on the content analysis, the key skills cited among the top scoring peers include:

- Enthusiastic nature
- Punctuality
- Cooperative engagement
- Timely communication with peers
- Attention to details
- Confidence
- Sincerity

Enthusiasm was one of the most common characteristic that top scoring students seemed to possess. Students while reviewing their peers noted how an enthusiastic nature can influence overall team performance and make a difference. For instance, one student in their review noted positively about a peer "*He is the most enthusiastic person in our group. When we had any problems in our meetings, he always gave us amazing ideas…..He likes to tell jokes to make our meetings and communication more lively*". Another student who awarded a high 85% to one of their peers wrote "*He was an active, determined and diligent individual. Punctuality, collaboration and initiative were remarkable disciplined behaviour in him that I was impressed with while working on the module*". Unpunctuality or low attendance in group meetings seemed to be a common problem for many teams affecting their group productivity. This was one of the reasons many students provided while awarding low scores to some of their peers. One student while giving a low 40% mark to another in their team justified "*She was missing most of the lessons and so was lacking some important instructions from the lectures….We were not able to repeat every detail from the lessons to her…She was also absent from few of the meetings and therefore did not contribute as much as the other members*". Students also graded their peers based on their level of cooperation and engagement with the team activities. Peers who engaged well, showed good cooperation with other members and were sincere with their works scored high in comparison to ones who didn't. As evident in one of the reflections for a score of 85%, the student explained "*He has been highly involved in the development of the business plan….He also actively participated in the meetings, giving suggestions and providing his opinion on several aspects of the work. His contribution heavily influenced the progress of the team*". Attention to detail in the areas of research, note keeping, making presentation slides and writing report drafts were also reflected in the peer assessment.

A lot of students showed a good level of depth and criticality in their peer assessment. They showed a clear critical distinction between students they graded high to students who scored low thereby eliminating the possibility of bias in their scoring approach. This is in fact a strong advantage of reflective writing in comparison to other peer assessment tools like rubric where students score or grade their peers without needing to reflect or justify. The following example of a student who graded one of their peers 90% and another 60% demonstrate this aspect. For the higher scored peer, the student wrote "*She was an enthusiastic, motivated and hardworking person. I also admire her modesty as she was always asking for feedback regarding her work from all members. In addition, she acknowledged constructive and positive feedback and far more likely to listen to criticism and negative feedback…*". This was in contrast with the peer who scored low and the student clarified "*The reason why I have allocated the lowest score to this peer comes from the fact that he was the only member who was absent from some of the group meetings….his contributions was limited. It seems to me that he was the least enthusiastic individual in the group and exhibited minimum commitment*".

Students also noted confidence and inquisitive nature among peers as pivotal for boosting team spirit. There were students who questioned and put forward arguments or contradictory views during team activities making their overall group work more productive and focused. Qualities that inhibited group performance include overconfident nature or stubbornness. Students reported how some of their team members dismissed feedback from other members or module lecturers. Some showed a lack of respect towards other peers, lacked communication skills and were unable to meet assigned deadlines. Such performances were graded low in the peer assessment. Another skills gap among peers was an introverted or quiet personality which many believed can lead to a lack of engagement or participation in the group activities. In this context, one of the students reflects "*I think she can be a bit more active in our meeting and give some of her ideas to us.*

She is a quiet person and it is not very good when we work as a team".

As evident in this study, the reflective writing exercises on peer assessment can not only give a clear indication of the strengths and weaknesses of different team members, it can also reveal a lot of information for academics and students to understand overall team dynamics and factors that contributes towards the success of a team.

B. Analysis of teamwork dynamics

As part of their reflective assignments, students were asked to discuss their teamwork dynamics and reflect on any advantages and shortcomings in their team management approaches and strategies. Most of the groups showed a good understanding of the value of teamwork. "*I learnt that a good teamwork is the main component for achieving success in any project when time and resources are limited*" says one student. Many noted how working in their teams gave them a thorough perspective of the different working styles of their peers. As one of the students notes "*I got to see the weaknesses and strengths of the team…I got to know who to push more in order to finish the work on time*".

One of the main challenges with teamwork is its efficient management which usually depends on the group's leader. Most of the students in this module seemed to struggle with this especially with allocating a leader in their teams to monitor and supervise the group engagement. One of them reflects "*We need to pick up a leader who could drive every group member to finish the final project…The leader should supervise each group member and manage the team's schedule*". Some even noted how they felt pressurized to take on the leadership role due to reluctance showed by other peers; one of the examples here says "*I felt pressured into the leadership position as I was the one to think about what to do next, set the time deadlines and give feedback to others*". Some discussed how the lack of leadership affected their overall engagement in the group meetings noting "*Some members were often absent from group meetings which had a negative impact, reducing enthusiasm among other members…The root cause of this problem was that our team didn't have a clear and powerful leader*".

Other shortcomings in some of the teams were lack of clear communication and motivation among peers as one of the students explains "*The main problem we faced in the group was lack of communication in terms of sharing information from our own sections with each other. We had members saying that they were ahead with their work than they actually were. Such communication issues plagued the group progress the most…*". Another similarly adds "*As a group we had a huge gap in teamwork and self-motivation…I learnt how important it is to have at least roughly the same motivated people in a team and how important it is to learn and to know how to work in a team*". Language barrier was another issue that some students picked up in their analysis of teamwork having worked with students from different cultures. In this context, one student examines "*From the beginning, it was natural for some group members to speak in their native language during team meetings and discussions. So, it was really hard for me to keep up with them*". There was also reflection on the lack of consistency with group reports when parts of it are shared and written by multiple members. One of the groups who faced this problem highlighted "*The best way to solve such issues is to leave enough time for revision by at least two members from the group before the final submission*". In this context, another student notes "*This has taught me to coordinate with others and as an individual to put group interest in the first place. Maximize individual strengths and minimize weaknesses to achieve the team's common goals….harmonize each team members' standpoints to attain some balance….*".

The reflections also illustrated the productivity of group meetings with many arguing how some of their peers didn't engage or contribute effectively. One of the quotes reflects "*We did not use the meetings to its full potential….our meetings were short …and there was not enough debate between group members as they would only listen to what was being said from the more active members*". On a similar context, another adds "*Everybody was in a rush to end the meetings and didn't ensure that we meet the overall objectives. My impression is that if we had stayed longer, had more discussions and maybe more arguments…our meetings would have been more productive…*". Such reflections can be a very useful source of information for not only the team members but also project supervisors and module leaders as it paints a picture of the group dynamics from students' perspectives.

C. Students' perspectives on peer assessment

The students interviewed for this study discussed their perspectives and attitudes regarding peer assessment using rubric and reflective writing methods. For a lot of these participants, bias towards close friends seemed to be a common and consistent issue. "*One of the challenges with peer assessment is that you feel like giving better marks to your friends*" notes one of the participants. Another adds "*You don't want to be overly critical but you want them to do well essentially*".

With rubric marking, some discussed witnessing bias among peers. In this context, one of them comments "*You tend to give some higher or lower scores depending on how you like or dislike that person*". For many, peer assessment was a new experience which added some level of unfamiliarity, lack of confidence and hesitation with their approach to decision making on grades and scores. One of the students explains *"The main problem for me was that since it was the first time marking my friends, I wasn't very good at it. I didn't understand the parameters which should be taken into account and how to assess each parameter correctly*". Few of them even revealed how they compare their peers' performances to their own expectations before grading. As evident in this quote "*I usually compare my peers' performance to the performance that I would have expected from me. Of course, it is not the right way to assess other people's assignments. So, more practice and experience needed in order to get the marks right*".

On comparing reflective writing with rubric assessment, students highlighted few issues with the latter. Many found rubric assessment to be slightly difficult to use given their limited experience and understanding of peer assessment prior to this degree programme. Two commonly cited problems with the rubric used at York were lack of flexibility with time and a complicated marking scheme. This rubric is in an online assessment format and students are asked to grade their peers on the day of the assessment. They are given access to the rubric for a limited amount of time to enter their grades. Some commented "*The Rubric requires you to make instant decision…*". Few reported how back-to-back peer marking sessions can decrease their interest and concentration level affecting their decision making and grading skills. However, there were students who found the detailed grading criteria in the rubric useful; one of them summarizes "*Rubric was really detailed to the point that it was difficult to get it right at the given limited time. But it was structured and nicely broken down into different criteria which I prefer*". The reflective reports for the 'Enterprise' module didn't have such a detailed marking criteria like the rubric. It gave students flexibility with the peer assessment approach through reflective discussion rather than grading certain criteria. A specific submission date allowed students time to think and analyze their peers' performances and review their notes before grading them. This assignment asks students to justify their scores with a critical reflection on any strengths and weaknesses of their peers and this reduces the possibility of bias. As one of the students confirms, "*The reflective writing gives you time to think what went wrong, what went right. The points you put are more honest than the rubric marking scheme*". Another similarly supports "*I prefer the reflective report for peer assessment because we don't have to make an instant decision. You have time. The rubric is sometimes not clear. It is difficult to understand the categories*". Some noted how reflective writing can improve team dynamics, "*You can see your team members' blind spots, their weaknesses and strengths and that of the group as well*" explains one participant. There are however, some limitations with reflective writing as some of the students pointed out in the interviews. "*Reflective writing is time consuming…..*" says one. Some found the flexible nature of reflective writing very vague in comparison to a structured rubric assessment. Despite these limitations, it appears from this study that students with limited peer assessment experience seem to prefer a reflective writing method over rubric assessment for peer assessment. For novice peer assessors, a formative reflective writing based assessment might be a good and flexible platform to gradually build up the skills and understanding of summative peer assessments. Reflective assessment can also be an efficient approach to understand group dynamics in teamwork which can facilitate professional and lifelong learning. As one of the participants summarizes, "*I gave more fair marks on the reflective essay….The assessment has no clear work breakdown. It is time consuming but it provides a nicer and more justified quality. It helps you understand how you approached teamwork, how you reacted to other people's actions and behavior. It helps you to understand the dynamics of the team*".

V. CONCLUSION

Peer assessment has been considered an important component in HE for promoting a strong participatory and collaborative culture among students. Based on its relevance within a professional and organizational context, researchers have deemed it as an employability skill. There are however, several issues with students engaging with some of the peer assessment tools like the rubric. This includes bias towards close friends, lack of confidence and reluctance to assess peers. This study explores the viability of using reflective writing as an alternate peer assessment tool particularly for novice peer assessors and whether it can eliminate some of the limitations and concerns associated with peer assessment. Using the case study of the MSc EM programme at York where students engage with peer assessment using both rubric as well as reflective writing, this paper analyzed the quality of the students' reflection and skills gap analysis. The findings show a range of skills identified by students among their peers to justify their scores. Such reflective justifications indicate the depth and criticality placed in their assessment which is usually not available from other peer assessment tools. Students also reflected on their teamwork dynamics identifying any shortcomings and advantages in their group strategies and management. Having reflected on the strengths and weaknesses of their peers gives students a good overview of their teams. Most of the students interviewed as part of this study preferred reflective writing over rubric for peer assessment. They found the structure of rubric complicated and felt that their grading wasn't as fair as that of reflective writing assessment. Compared to rubric assessment, reflective writing however, is time consuming and students need guidance, support and training before engaging with it.

Overall, the findings highlight the importance of peer assessment particularly for students involved with teamwork based activities. Being a pivotal skill, HE should encourage more peer assessment based exercises to build up students' confidence and understanding of it. Given its flexible and simple structure, students with limited peer assessment experience might find reflective writing a better platform to start with and gradually build up their peer reviewing skills.

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