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Avoiding Pitfalls of Peer Assessment

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Abstract

This paper describes an investigation of web-based peer assessment undertaken by undergraduate students. The study endeavours to offer reasons for low levels of participation and suggest means for improving levels of engagement in peer-review processes. Results are based on formative peer assessments and a follow-up questionnaire completed by 36 computing students. The paper discusses the potential limitations of the teaching methods and technologies used. Results highlight the importance of: (1) formally supporting peer-review activity during in-class sessions; (2) providing a mechanism for anonymous participation; and (3) allocating marks for increasing student participation in the peer-review process.

1. Introduction and Background

This case study is of peer-assessment among undergraduates working in groups. Experiences and student-feedback are used to inform how teaching and technical approaches may be modified to improve exercises and levels of peer-participation.

If participants are of similar educational status, it is generally accepted that peer assessment is useful for both formative feedback and summative grading [1]. Peer assessment also aims to enhance the learning experience by encouraging deep learning and developing skills in critical evaluation [2, 3].

A review of the literature indicates great variation in the models of peer assessment used in higher education. While originally used in writing courses [4], studies on peer assessment now span many subject areas.

Topping's review and typology of peer-assessment [5], records 17 models classified according to variations in characteristics such as outputs, privacy, official weight (summative contribution), participant ability. Topping also highlights the importance of

considering anonymity when designing peer assessment exercises.

Earlier studies suggest that peer assessment may encourage students to engage in cognitively demanding activities. Examples include comparing, clarifying, contrasting, diagnosing, considering deviations and summarizing information. These activities are believed to reinforce knowledge and lead to better understanding and deeper learning [6]. Additionally, peer assessment supports development of teamwork and communication skills [7], and improves the understanding of institutional assessment processes [8].

2. Case Study

The study summarized here is based on year-long modules concerning the development of database applications and offered to second year undergraduates on both BSc and FdSc courses in computing. The peer assessment exercise was introduced as an optional addition to a group-work assignment for which 20% of module marks were available. The typology [9] of this peer assessment exercise could be expressed as being formative, out of class, mutual, distance, not graded, voluntary, cross ability, group peer assessment. The main incentive for student participation was an opportunity to improve work (consequently, grades) on the basis of suggestions made by their peers.

The peer assessment exercise was delivered in asynchronous mode using a discussion board on a Blackboard™ virtual learning environment. Each discussion board thread comprised the original report and the peer-reviews for each report.

Only four students in two groups completed the first peer-review task. Although posts were of high quality, the low level of participation was of some concern. Participant attitudes and behaviour were therefore investigated further with respect to: [a] critical reflection; [b] extent of passive (lurking) and active participation; and [c] by extending the study in an attempt to understand attitudes towards specific components of the peer assessment exercise.

3. Research Aims and Analysis

This investigation aims to understand attitudes, as well as behavioural, teaching and technical factors that may influence levels of student participation in peer-review exercises. Towards this end the afore-mentioned peer-assessment case study is assessed with reference to discussion-board log metrics and a questionnaire returned by 36 peer-review respondents.

3.1. Analysis of the Blackboard access records

In addition to active participation, log entries also contain records of passive presence (lurking) around the discussion, assessment and announcement areas established to support the peer-review process. Logs record 168 ‘views’ of posted materials by 18 students (50% of the cohort) accessing exhibited work and feedback. Log statistics therefore suggest: [a] a high level of interest amongst ‘passive’ participants in work submitted by colleagues; and [b] that passive “non-posting” involvement was much more widespread than active participation.

3.2. Student feedback on peer assessment

A 21-item questionnaire was issued to determine student opinion concerning: [a] the *rationale* for peer assessment; [b] the *design* and *delivery* of the exercise; [c] *levels of comfort/acceptance* associated with elements of the peer assessment process; and [d] web technologies used for the exercise.

The great majority of students indicated that the exercise was fairly well explained and presented (86% or responses were recorded for categories of “satisfactory” and “very clear”). Additionally, results indicated that 67% of all respondents were interested in being able to view the work of their peers; this observation is also consistent with behaviour recorded in access logs. A greater proportion (78%) believed that the exercise could be beneficial. The proportion of those considering the exercise to be of no benefit (22%) was great enough to be of concern to the teaching team. While most students were interested in accessing their peer’s submissions, only 50% were interested in providing feedback to their classmates.

The discovery that students were more inclined (78%) to engage if marks were awarded for participation is consistent with earlier studies [10]. A significant proportion (22%) suggested that one principal area of improvement would be to reward the

quality/level of participation in peer assessments through summative grading.

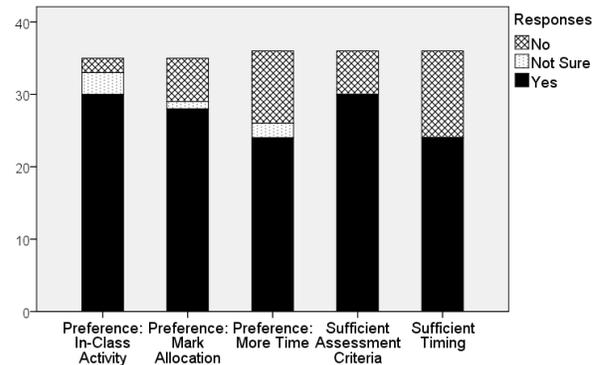


Figure 1: Preferences in exercise format.

The timing of the exercise was another factor shown to be important for increasing levels of participation. Two thirds of respondents indicated that timing would affect their level of engagement in peer assessments. Many preferred to conduct peer-reviews in-class rather than off-site and three students (8%) were particularly emphatic on this point (see Figure 1.).

Earlier research suggests that less desirable effects of peer-assessments may include increased participant workloads and anxiety levels [9]. The assessment of student ‘comfort’ level with regards to anonymity and workload revealed that 43% of participants were “very/uncomfortable” to post their work publicly. Students felt relatively more comfortable in terms of workload: 74.2% (mean=3.09, std. dev.= 0.951, n=35) of respondents indicated workload to be from “moderate” to “insignificant” (Figure 2.). However, only 8.3% indicated insignificant increase in their workload, showing the demanding nature of the exercise.

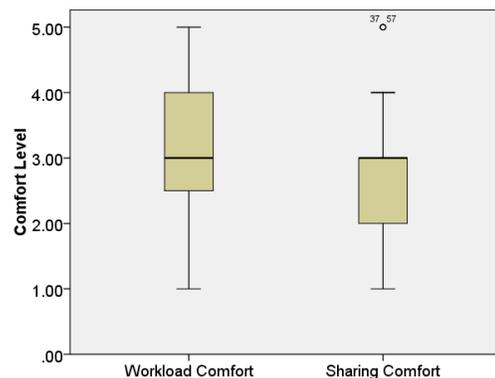


Figure 2: Comfort level of students with [a] added workload and [b] required sharing of work (1: least; 5:most comfortable). Note: box plots are paired here for convenience of presentation only. Lickert scales for the two boxplot distributions should not be

compared because they are nominal and represent different but (statistically) interdependent ‘comfort’ metrics.

For the purposes of triangulating/confirming the results reported above, students were also asked to express which improvement they believed might have the greatest “participation encouraging” impact in peer assessment exercises. Results (see Table 1.) indicate that allocation of marks (22%) and clearer justification for exercises with provision of further support in completing reviews (together 20%) were the most important factors in influencing engagement with peer assessment. There was also notable support (11%) for delivering peer assessment exercises in-class.

Table 1: Suggestions for improvement.

<i>Suggestions</i>	<i>Freq.</i>	<i>%</i>
<i>Clearer Justification</i>	2	5.6
<i>Clearer Justification and Support</i>	3	8.3
<i>Critical Mass of Participants</i>	2	5.6
<i>Allocation of Marks</i>	8	22.2
<i>More Support</i>	2	5.6
<i>In-Class Activity</i>	3	8.3
<i>In-Class Activity/Less Formal</i>	1	2.7
<i>More Time Allocation</i>	2	5.6
<i>No Suggestions Made</i>	13	36.1
Total	36	100

4. Conclusion

Results from this study suggest that although participants generally accepted the peer assessment process, they did not necessarily fully appreciate the potential benefits of review and reflection activities. Thus, it is apparent that greater effort, further support in the form of tutorial input, extended explanation, in-class (facilitated) work are needed to embed this technique as part of the learning culture.

Many students were also anxious about exhibiting work publicly, most preferring to post submissions anonymously. This indicates that further measures are needed to raise confidence and reassure participants that the review/reflection environment can be a constructive, non-judgemental and safe extension to face-to-face learning networks.

As a result of these findings, the authors are very aware of a need to revise peer-assessment approaches in computing courses. The overall aim of such revision is to reassure participants that formative and reflective assessment is a safe and effective means for improving critical evaluation and self-reflection. Specifically, the most important measures will be: (1) amend marking criteria to reward genuinely constructive reviews and

reflective responses; (2) allow some level of anonymous participation – thereby, perhaps, reducing anxiety of public participation; and (3) provide greater support when introducing peer-assessment processes to reduce participant anxiety and so that review and reflection become more fully integrated in the learning environment.

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