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ABSTRACT

The purpose of this paper is to report a successful technique for assessing cooperative group work reliably and validly. The paper demonstrates a simple-to-use assessment procedure that tracks individual accountability, energizes student interaction, and rewards cooperative learning, even as it uses fewer administrative resources than traditional approaches. The difficulty in assessing an individual's contribution to group work lies in determining who did what. The solution suggested here is to separate the assessment of the final product from the assessment of each individual's contribution. In practice, students are given the criteria for the final product at the beginning of the work, and they receive a confidential feedback sheet on which they make a judgment about the percentage of each member's contribution to the group work, including their own if that assessment is culturally appropriate. These forms are confidential and not anonymous. The form also asks for the rationale for each judgment. Percentages awarded by each group member are averaged, and this average is applied to the product of the independently awarded product score times the number of members of the group. Students are not asked to assess the quality of the work, but only the contributions of each group member. (Contains 1 table and 10 references.) (SLD)

'Who Did What': Maximising Collaborative Learning by Using Accountable Assessment

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'WHO DID WHAT'

MAXIMISING COLLABORATIVE LEARNING BY USING ACCOUNTABLE ASSESSMENT.

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This paper demonstrates a simple-to-use assessment procedure that tracks individual accountability, energises student interaction and rewards cooperative learning, yet uses less administrative resources than traditional approaches.

Introduction

Lecturers are aware of the great potential of student centred social learning to enhance group cooperation and raise academic standards. However, one of the drawbacks that seems to prevent wider use of this learning paradigm is the problem of traditional assessments - reliably assessing who does what. Specifying individuals' roles in an effort to use accountable assessment can prevent social interaction. Yet, traditional assessments, where everyone receives the same grade, can breed apathy, lower standards and undermine the collaborative learning advantages of this paradigm. This paper demonstrates a simple-to-use assessment procedure that tracks individual accountability, energises student interaction and rewards cooperative learning, yet uses less lecturer time and effort than traditional approaches. The method has a built-in reliability measure and offers other checks and balances to ensure fairness. The process will be illustrated with actual assessment data. Classroom research with this technique has revealed a fundamental learning problem that lecturers need to address to ensure greater success for the less able student in collaborative learning groups.

> 'Large-scale assessment programs are beginning to design group assessment tasks in which small groups of students collaborate to solve problems or complete projects. However, little is known about the validity of data from group assessment for making inferences about the competence of individual students.' (Noreen Web, The National Center for Research on Evaluation, Standards, and Student Testing, Los Angeles, CA.)

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The purpose of this paper is to report a successful technique for validly and reliably assessing cooperative group work. This technique offers full accountability and can be effectively replicated by lecturers and course administrators. Groupwork here refers to collaborative assignments where a team of students work together towards a common resulting performance - traditionally this is a report and alternatively it can be a presentation, debate, poster display, drama, community project, etc. etc. First we outline some of the advantages of groupwork and then some of the problems with assessing groupwork. Then a detailed description and example is given to enable a lecturer to replicate the method in his or her own classes.

Reasons for involving adult students in group assignments

There are many authentic assessment reasons for involving adult students in group assignments including the emancipation of students (Patterson, 1996). Groupwork encourages students to take considerable responsibility for their own progress and to plan their work. Students experience how to negotiate work roles and agreed standards. They learn to give and receive feedback. They have opportunities to learn project time management. Groupwork embraces student's individualised goals and interests. It is particularly helpful in raising the attainments of lower performing students by offering pedagogical advantages of social learning, peer guidance and the sharing of knowledge and experience with higher attaining students. Students are energised by cooperative groupwork and see distinct learning advantages in this paradigm (Orsmond, 1996). Results of other studies have shown that students think peer assessment is an important part of the group grading process (Keaten & Richardson, 1993). Student reactions to the cooperative assessment processes are overwhelmingly positive (Griffin, 1994).

Group assignments raise the attainments of lower performing students

Assessment problems detract from usability of groupwork

Unfortunately the problems associated with assessing an individual's contribution to a groupwork performance have detracted from the usability of the excellent learning paradigm. The difficulty lies in needing to know who has done what so that it can be assessed by the lecturer. An alternative is to give every student the same mark. However, Conway (1993) reports that students complain that group scores are an inadequate reflection of individual effort. This results in complaints from the better students who carry the lower achieving

Main problem - needing to know who has done what

students and in social loafing from the other students (Rotfeld, 1998). As Gibbs (1993) says:

> 'Problems within groups relate to the differential contributions made by the group members. It is common for some students to contribute more than others to the production of the group report. Those who contribute less (either quantitatively or qualitatively) may deserve a lower mark than those who contribute more. Normally, however, group members' contributions are not apparent to the marker, who only sees the final report and not the process by which it came to be written. In this situation it is possible for low contributors to be 'carried' by the high contributors without incurring a penalty. The difficulty of arriving at a fair mark for individuals is one of the most common reasons for not using group work for assessment purposes, despite its many advantages for learning.'

Another common solution is to predescribe as closely as possible what should be the role of each member. This solution destroys many of the advantages of cooperation and removes responsibility from the students for negotiating their work roles.

Flawed solutions

More common alternatives involve different forms of peer assessment rather than lecturer assessment. With peer assessment each student assesses the contribution of other group members. Sometimes they are asked to also include an assessment of their own contribution. Brown and Knight (1994) have noted some of the problems that these alternative can cause.

Give every student the same mark

Prescribe roles

> 'Students over-marking their colleagues' work because of friendship or loyalty, or settling old scores by giving others bad marks. Students colluding on the lines of 'we will give you a good mark, if you give us a good mark'. Students making unsophisticated judgements based upon superficial or inappropriate criteria, such as giving higher marks to the more showy, noisy, extrovert members of the group and lower marks to the quieter members, who may equally have made significant contributions to the group process, but have tended not to make such a noise about it.'

Use peer assessment

A major assessment error involved in peer assessments is relying on assessors who are inexperienced in assessing the content. As a comparison, this practice would not be acceptable in a business environment where work assessments are given by trained personnel. However, an institutional advantage of accepting adult students' contributions' to the assessment process is that it helps them to accept the authority of this assessment because they have contributed their democratic component. These problems of validity and reliability should be solved before we can use this paradigm for accountable individual assessment.

This solution

Separate assessment of product from peer assessment of each individual's contribution

At start Give usual criteria for product

Give confidential (not anonymous) feedback forms for individual assessments and supporting reasons from work log

The solution that is that is presented here to these and other problems with group assessment is to separate the assessment of the final product from the assessment of each individual's contribution. In practice, at the beginning of the work students are given the criteria that will be used for marking the final product. They are also given a confidential feedback sheet on which they will make a judgement of the percentage of each member's contribution to the group work, including their own if it is culturally appropriate. It is reiterated that these forms are confidential and not anonymous. They have a place for the student's printed name and other identification because it might be necessary to query information on the forms with the student who wrote it. The marks given by each student are required to total to 100%. The requirement that they should total to 100% imposes a little more consideration on the students' judgements because sometimes the marks given require a finer adjustment to total exactly to 100%. It can be brought to the attention of larger groups that they may use decimal fractions if necessary. In addition, the confidential feedback form asks for the rationale for each judgement. It is therefore pointed out to the students at the start that it is in their interest to ensure that the other group members know what they do and that they should keep a log of what others do in order to write these rationales. This instruction mitigates the differential influence of extrovert v introvert contributors mentioned by Brown and Knight (1994). The confidential feedback forms are to be completed, signed for

authenticity, folded and stapled and placed with the other members' forms in a sealed envelope that is submitted as an appendix to the final product.

At end Name, sign, fold-n-staple, seal all forms in envelope as appendix to group's product

When the product is submitted it is assessed separately from the contributions using the criteria that were given at the start. This product assessment can be done by the lecturer, a blue-ribbon panel or in any way that is appropriate to the content. Further the marks given for the content can be scaled of standardized as is necessary. All that is required is a final mark for the worth of the whole project that can be used for calculating each individual's final mark.

The percentages awarded by each individual are conveniently entered into a tableau as shown in the following example from a group of size 5

ED30F Group assessment

Group Number		Marks avaliable		395	Percentages awarded by group members					Average awarded	Std. Dev awarded	Raw individual mark	Individual mark
Subject area		Group % for assignment		79									
10	Maths	Number in group		5									
st/id	disc-id	name	st/id		21	22	23	60	62				
21	95-(	Confidential Names and IDs	Nicola		25.0	25.0	24.0	25.0	24.0	24.6	0.55	97.2	97
22	95-(		)na		21.0	19.0	18.0	19.0	20.0	19.4	1.14	76.6	77
23	95-(		Felix		14.0	15.0	17.0	17.0	15.0	15.6	1.34	61.6	62
60	97-(		ndre		24.0	23.0	23.0	22.0	22.0	22.8	0.84	90.1	90
62	97-[illegible]		onna		16.0	18.0	18.0	17.0	19.0	17.6	1.14	69.5	70
		% total check = 100%			*100*	*100*	*100*	*100*	*100*	*100*			
Corr sd of given			Means		20.0	20.0	20.0	20.0	20.0	20.0	1.0	79.0	79.2
with received =		0.74	St.devs		4.8	4.0	3.2	3.5	3.4	3.7	0.3	14.6	14.3

How to use the tableau

For example, column 21 has the five marks awarded by student No.21 these are 25.0, 21.0, 14.0, 24.0 and 16.0 and the '% total check' is 100 as required. When the marks have been entered for all five columns, in the same row order, then each row holds the marks awarded to each student. So in this example the first row is for student 21 and the marks for that student are respectively 25.0 (self-assessed), 25.0 (from student 22), 24.0 (from student 23), 25.0 (from student 60) and 24.0 (from student 62). The average of this row, 24.6%, is the percentage of the total mark that the group has allotted to student 21. To find the final mark for this student we find the number of marks that have been made available from the assessment of the performance and the number of group members. In our example it is 5x79=395. That is the quality of the finished work was independently assessed at 79%. The 79 is multiplied by the number of members in the group, 5 in this case, and each student gets their share e.g. student 21 gets 29.4% of 5 x 79 which is 97% as shown in the last column of the tableau.

Improved reliability

However, before using this mark we must be satisfied with its validity and its reliability. A glance down the column of Standard Deviations at these small numbers shows the agreement with which the group marked each member. In row 21 for example, the standard deviation is only 0.55 which shows that there is good agreement and hence reliability for the mark awarded to student 21. These numbers can be used for a more sophisticated measure of reliability if necessary. In this example the standard deviation column shows the high reliability of the marks given. If a mark appears unreliable then it is possible to compare the reasons each group member gave for their judgement of that student by checking the rationales that they wrote on their confidential forms. In this rare event it likely that some sub-group dynamic will be identified and suitable adjustment can be made if necessary. The ultimate fall back position, should it ever be necessary, is to ask the students whose names are with their comments to clarify the matter and even show their logs of what was done. These are security features of the technique.

Improved validity

Validity of any marks can also be assessed by comparing the content of what was written about each member's contribution. It should be noticed that the students are not being asked to assess the quality of the performance, which is something they may not have the valid expertise to do. The students are being asked to assess the contributions of each member based, not on some preconceived listed criteria that has been given to them (Brown, 1996), but based on what actually happened while they were working together. This is something that they are in the most valid position to do.

It can be seen that this technique is efficient in terms of lecturer time and resources as only the finial product needs to be assessed rather than the individual products of the separate group members.

Fundamental learning problem revealed

Research with this technique has revealed an unexpected fundamental learning problem. This tableau shows that the correlation between the standard deviation of the marks given and the average marks received is +0.74. A positive correlation is a consistent finding across subjects and content areas. It indicates that a fundamental learning problem of low-achieving students is they lack the necessary discrimination of what the work entails. Further research is being done in this important area.

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