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Peer assessments of GPW: Infusing fairness into students' assessments of peer contributions

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Abstract:

This paper contains results of an empirical study that tested the efficacy and acceptability of two templates designed to fully involve students in proper and fair peer-assessments of their group project work (GPW) by providing concrete evidence of independent progressive documentation of their peers' contributions to the work-process and end-product(s).

Two compatible templates – the Progressive Evaluation Template (PET) and the Peer Assessment Criteria Template (PACT) – were developed to enable students provide progressive documentation of their peers' contributions to the student-led group project process in order to support the marks they award their peers and, at the same time, show concrete evidence of their fairness in the entire peer-assessment process. The templates were trialed through experimental usage by the faculty and students of three undergraduate courses in The Media School of Bournemouth University in Bournemouth, United Kingdom, and four undergraduate/graduate courses in the School of Business & Entrepreneurship of Lindenwood University in Saint Charles, Missouri, United States. The trials were conducted in the 2009/2010 and 2010/2011 academic years respectively. The efficacy and acceptability of the templates were then tested through a cross-national opinion survey of the students in the seven courses.

The study results generally indicate positive acceptability of the templates and a significant relationship between the students' acceptance of the tools and the levels of usefulness, comprehension, ease of use, and fairness they attributed to them. In discussing the aggregate findings, the paper also recommends ways of using the templates in digital peer-assessment contexts.

Keywords: Collaborative learning, Student-led coursework, Group project work (GPW), Peer assessment, Assessment review.

INTRODUCTION:

Existing research on peer assessments of group project work (GPW) in higher education indicates that students learn more from each other in collaborative contexts by studying educational materials, critically analyzing theories, writing up projects, and assessing each other's contribution to the group work (van den Berg et al., 2006; Almond, 2009). The curricula implication of peer assessment is that while it is ideal for a teacher to evaluate and award marks for the end-product(s) of a GPW, the students are in a much better position to evaluate the work process, much of which takes place outside the classroom and in the absence of the teacher.

The advantages of involving students in peer assessments have been articulated by several scholars. For instance, Race (2001) is of the view that including self and peer assessments in curricula assessments legitimizes what students already do instinctively on their own, and helps them to do it a lot more efficiently. Freeman (1995:p289) asserts that peer assessment of GPW promotes "independent, reflective and critical learning" among students. Ellis (2001) also adds that peer assessment improves critical thinking and group assertiveness, while Pope (2005) confirms that peer assessment ensures greater student participation in the learning process in general.

However, many issues have been raised about students' anxieties and doubts concerning the fairness and effectiveness of peer assessment (Fry et al., 2009). These issues range from unfairness, favoritism, collusion, to outright vendetta in the evaluation and grading of peers' contributions to the group project work. Some of these issues were observed by the authors of this article in the course of their respective teaching experiences in the UK and the US. In 2009, the origin of the problem was identified as lack of a concise peer-assessment tool with the right set of evaluative criteria that could infuse fairness into students' peer-assessment processes. Two innovative templates containing elements of progressive evaluation and documentation of peer contributions throughout the GPW period were then designed and trialed in student-led group projects. The aim was to help students to provide concrete evidence of fairness in their peer evaluations. This paper documents the results of the post-trial surveys conducted in the UK and US to examine students' appraisal and acceptance of the templates as effective tools for fairer assessments of their peers' contributions to group coursework assignments.

1. LITERATURE REVIEW:

The Role of Group Project Work in Business Education Curriculum:

Business education curriculum at Higher Education (HE) level is not only designed to impart the knowledge of Business theories and principles in students, but also to prepare them for employability in the industry. As employers expect in most business-related professions, business education curricula must include programs that inculcate the skills of working collaboratively in small groups. Hence, as a fundamental pedagogical necessity in business education, student-focused group learning and student-led group projects are employed extensively in most areas of the business discipline (see Freeman, 1995).

Acquisition of the requisite knowledge and skills for business management requires the development of creative-thinking and problem-solving abilities, as well as the skills of written and oral communications, report writing, and business presentations. These skills are essential because professional industrial practice of business requires the generation of reliable

information and creative ideas that are aimed at solving internal and external organizational problems that will enhance the market potentials and competitiveness of the business. The pieces of information, often garnered through extensive market research, are vital for sound business decision-making; while the creative ideas, often generated through extensive brain-storming sessions, are used in solving huge customer-related problems in the market place.

The ideas and decisions thus generated must be produced, documented, and properly presented to the management (and sometimes the board) of the company before they are transformed into products and services worth millions of dollars in the market. Not only does the production and marketing of such products and services cost huge sums of money; even the generation of market information and creative ideas to support the product's market performance also costs a lot of money. No one individual can therefore undertake any such activities alone. They are usually undertaken as group tasks and often achieved through interdepartmental collaborative efforts. Acquiring the relevant academic knowledge and skills necessary for such collaborative industrial practice therefore requires an infusion of student-centered learning and student-led group project work in the educational curricula of most business-related disciplines.

While several business schools around the world still have large lecture sessions, most have also introduced weekly seminars in small groups of 15 to 35 students alongside the lecture sessions. In line with Bean (1996), the use of small learning groups, either in the form of classical classroom-teaching methods (25 to 35 students) or in small-group seminars (15 – 20 students) alongside large group lectures, is aimed at engaging business students more actively in student-centered collaborative learning. In affirming the efficacy of small-group student-centered learning, Light and Cox (2004) observe that "the opportunity to come together in small groups to change conceptions and explore theories and insights provides students with one of the most important learning experiences higher education has to offer".

To enable a closer discussion and understanding of the subject matter among students, contemporary pedagogy scholars also advocate the assignment of group projects to even smaller groups of about 4 to 6 students each within the original group. Atherton (2005) argues that dividing the class into such smaller groups aids the students in "undertaking substantial project work". A number of other scholars have also upheld the efficacy of assigning course works in very small groups. Li (2001) believes that working on a specific project in such small groups through the academic term, semester, or year enables students to engage in collaborative learning and know each other better.

Other benefits of assigning group project work (GPW) in very small groups include enabling students to "work co-operatively within a team" (Light and Cox, 2004:p117); to acquire and develop interpersonal and teamwork skills which will help them in their future professional careers (Johnston and Miles, 2004; Almond, 2009); to foster their feelings of ownership of their own learning process (Kwan and Leung, 1996); to test their skills against the reactions and feedback from their peers (Jacques and Salmon, 2007); to articulate their thoughts and connect their prior knowledge to the subject of the group's discussions in order to accomplish the required task (Schelfhout et al., 2004); to develop higher-level cognitive skills alongside valuable transferable skills which will enhance their employability (Michaelsen, 1992; Lekj and Wyvill, 2002); and to generally let them create an independent (teacher-free) learning environment of their own, controlled and organized by them, and which allows free uninhibited expression by all peers (Light and Cox, 2004).

Issues Arising from Peer Assessments of Group Project Work:

There are many ways to incorporate peer assessment into the curriculum of a business or social science program, include allowing the students to evaluate their peers and share a group mark previously assigned by the teacher or to generate their own peer-assigned scores. In many cases, the students' peer-assigned scores are merely for formative assessment purposes and do not count toward the final summative assessment grade of the course. In other cases, the students' scores are weighted, usually between 10% and 30%; and the teacher's scores are also weighted, usually between 70% and 90% of the overall assignment grade. This is a much better way to involve students in the assessment of their own learning experiences. Race et al. (2005) support this notion by observing that students have shown greater interest in peer assessments when the scores they give each other count towards the final cumulative grade of the coursework assessment. According to the scholars, "if students are to take peer assessment seriously, it should count for something, even if only a small proportion" (Ibid: p.135).

However, the idea of peer assessment has not always received unanimous acceptance among HE academics. On the contrary, there are several critics of this assessment method who see nothing but problems in its adoption. For example, Zhang et al. (2008) question the reliability and inclusiveness of peer assessment and argue that it is susceptible to unfair rating and vendetta by some students. According to Fry et al. (2009:p141), "peer assessment is often seen as unfair because students do not trust each other's judgments, worry about favoritism and friendship-influencing marks, feel it is the responsibility of the lecturer, and so on". Pope (2005) also notes that peer assessment is prejudice-prone because even a teacher's attempt to correct an unfair peer assessment will automatically introduce bias into the evaluation process.

Other disadvantages noted in the literature include over-generosity with marks due to familiarity, friendship, or fear of peers' admonition and retribution (Roberts, 2006). There is often inconsistency of evidence provided to support the marks awarded and inability to ascertain the accuracy of peer assessment in measuring overall learning outcomes (Boud et al., 2001). There is also inconsistency of mark-awarding criteria among different groups where more than one group is involved in the same assignment (Jaques and Salmon, 2007; Zhang et al., 2008). Altogether, collusion is the single most-outstanding issue among students when peer assessment is involved. This usually occurs in the form of a collaborative manipulation of marks by team members, whereby they give each other exactly the same scores in order to appear fair to all members of the team. However in seeking to be fair, they actually become unfair and make nonsense of the entire peer-evaluation exercise, especially where there are no specific peer-assessment criteria laid out for the students and no tool given to them for providing evidence of their progressive evaluation of their peers' contributions during the group work process.

The Need for better Peer-Assessment Enhancement Tools for Business and Social Science Curricula:

Various curriculum scholars have advocated that peer assessment should be an integral part of curriculum development, and that it should not be taken for granted because it cannot be effectively achieved on a holistic basis at the discretion of students. Gatfield (1999), Li (2001), and Bushell (2006) advise that just as teachers specify their own assessment criteria in curriculum development, they should also specify some evaluation categories that will guide students' assessments of their peers. The scholars note that a lot of the anxieties and issues

usually raised against peer assessment could be solved by specifying a clear list of categories as peer-assessment criteria to guide the students in their judgment. Osmond (2004) also advises that the peer-assessment criteria should be clarified and negotiated between the tutor and the students, with the students allowed the opportunity to clearly articulate their own understanding of the evaluation categories.

However, many HE educators either fail to adequately take care of this aspect of their curriculum design or leave out group work peer-assessment altogether. The result is that no set of evaluation categories has been put forward as a generally adaptable peer-assessment criteria template for evaluating group project work (GPW) in HE business education curriculum. Bhalerao and Ward (2001) observe that computerized course assessment tools have been traditionally focused on the grading of multiple-choice quizzes, including CASTLE (Leicester, 1997), TRIADS (Derby, 1999), MERLIN (Hull, 1999), and COSE (Staffs, 1999). Very few online assessment tools provide evaluative criteria for peer-assessing group written coursework, projects and presentations, including SPARK (Self and Peer Assessment Resource Kit) developed by Freeman and McKenzie (2002) at the University of Sidney, Australia; OPAS (Online Peer Assessment System) developed by Trahasch (2004) at the University of Freiburg, Germany; "Aropa" ("peer-review") developed by Hamer et al. (2007) at the University of Auckland, New Zealand; and *OASYS* designed in 1999 by Bhalerao and Ward (2001) at the University of Warwick in the UK.

However, even these online templates contain complex and inflexible evaluation rubrics difficult to adapt to social science and business courses. This is because, except SPARK, they were all initially designed for computer science and engineering courses. Even the peer-assessment platform designed by Prins et al. (2005) and embedded within the Computer Supported Collaborative Learning (CSCL) environment at the Open University of the Netherlands also provides only an interface for distant-learning students to give formative feedback to their peers who remotely work on individual assignments on the university's virtual learning environment. Hence, it is not amenable to the evaluation of face-to-face group projects.

As a result of this identified gap, it became imperative to develop a set of simple, easy-to-use, and adaptable peer-assessment templates with a set of generic evaluative categories for reliable peer-evaluation of student-led GPWs in business and social science pedagogy. That, plus the motivation to negate the peer-assessment shortcomings mentioned in the preceding section by providing instructors and students a simple evidential tool for progressive documentation of fair and unbiased evaluation of their peers' contributions to GPW, led the authors to design the two complementary peer-assessment templates (PACT and PET) discussed in the following sections and also presented in appendices 1A, 1B, and 2 respectively.

2. INTRODUCING *PACT* AND *PET*:

The Peer-Assessment Criteria Template (PACT):

PACT is a simple and flexible template that business and social science students can use for an independent and objective assessment of their peers' contributions in group project work (GPW), group research, and/or group coursework assignments that culminate in written reports and/or group presentations. While the tutor assesses the end-products (i.e., the written report and/or presentations), each of the students in each small group can use this form to evaluate the input of other individual members of the group to the group's work process. It contains a set of

marking scales that can be customized to fit any institution's grading system. For instance, the PACT was initially designed in Bournemouth University in 2009 to suit the institution's 7-point grading scale from "very poor contribution" to "exceptional contribution" (see appendix 1A), and was later modified in 2010 to suit Lindenwood University's 5-point grading system from "weak contribution" to "excellent contribution" (see appendix 1B).

The template also contains six generic evaluation categories as the assessment criteria on which the assessed student's contributions to various aspects of the GPW are judged by the peer-assessor. These include group meeting attendance, ideas generation, quality of ideas/material contributed, effectiveness in executing assigned tasks, team attitude/cooperation, and share of responsibility for team's overall situation. These criteria are generic enough to suit the evaluation of students' contributions to the preparation and production process of any kind of GPW in business and social science education. Students award peer-marks for each of these six categories using the marking scales as a judgment tool to decide what percentage range the peer deserves for each category.

In the end, the percentages for the six categories are added up (minimum of 0% and maximum of 600%) and then divided by 6 to arrive at the assessed student's overall score from the peer-assessor (100% maximum). Apart from being flexible in allowing the adaptation of the marking scale to each institution's grading system, PACT also provides students the opportunity to award marks in percentage for each of the six categories, thereby making the evaluation and grading of the contribution categories quite easy for all levels of HE students. Moreover, having the final score from each peer assessor in percentage also makes it easy to add up all the scores received by each student from his/her group peers, to determine his/her final peer-assessment score as an average of the total from the group, and also to modulate this final score by the weighting assigned to peer assessment by the instructor.

The Progressive Evaluation Template (PET):

The PET (appendix 2) is a continuous documentation template to be used by students in recording their evaluations of their peers' contributions to group project assignments throughout the duration of the work process. One separate copy should be used confidentially by the peer assessor for each assessed member of the team, and all entries for that person should be made on the same form throughout the work period. At the end of the work process, the completed PET is attached to the completed PACT as the assessor's evidence of progressive evaluation of the assessed peer during the GPW process. The PET therefore needs to be completed before the assessor fills up the PACT at the end of the GPW. This is necessary because it serves the assessor as the evaluative rubric upon which to base (and with which to justify) the marks given to the assessed peer on the PACT form. The PET is quite easy to use as each column is a simple six-scale questionnaire representing the same evaluative categories in the PACT. All that the assessor needs to do is tick the appropriate box for each category that represents his/her fair evaluation of the peer's contribution to that aspect of the work process at each stage during the work duration.

To make more effective use of the PET, once the small group is formed and the project is assigned by the instructor, the number of meetings the group intends to hold through the duration of the work should be agreed upon. The number of "group meeting" columns on the PET can then be reduced or increased in line with the number of meetings agreed upon by the group. If possible, the initial tasks required to be performed by each member should also be determined

and assigned in advance, so that their evaluations can start right from the first formal meeting. Tasks can, of course, be reviewed in phases depending on the nature of the GPW. Both PACT and PET are not meant for self-assessment, but instructors may adapt them for simultaneous peer- and self-assessment if they choose to combine both types of assessment.

3. METHODOLOGY:

The Template Trials:

Paper versions of the PACT and PET (appendices 1A and 2) were trialed in three undergraduate courses that had group project assignments as part of their full-year coursework in The Media School of Bournemouth University in Bournemouth, United Kingdom, during the 2009/10 academic year. These included: Advertising, Marketing Communications & Branding, and Media Planning. Each of the three cohorts had about 100 students, being about 300 students in total. They were separated into 5 seminar classes of about 20 students per class. Each class was further split into 4 small teams of about 5 students per team for their group project assignments. Since peer assessment was a required component of the coursework assessment, about 98% of the students completed and turned in their PACT forms, while only 70% completed and attached their PET to the PACT.

Paper versions of the templates (appendices 1B and 2) were also introduced in the peer-assessment components of four undergraduate and graduate business courses that also had GPW in the School of Business and Entrepreneurship of Lindenwood University in Saint Charles, Missouri, United States, in the three semesters between Spring 2010 and Spring 2011. The courses were Principles of Marketing (Spring 2010, Fall 2010, and Spring 2011 classes), Consumer Behavior (Spring 2010, Fall 2010, and Spring 2011 classes), Introduction to Research Methods in Business (J-term 2011 class), and Marketing Principles and Issues (MBA Spring I and Spring II, 2011 classes). There was an average of 30 students in each of the nine classes (being about 270 students in total) and they were also split into 5 small teams of about 6 students per team for the purpose of their group project work. As earlier indicated, the grading scale of the PACT was adjusted for the US trial in line with the Lindenwood University 5-point grading scale (see Appendix 1B). All the students in each class turned in their completed PACT templates, while only 52% returned their completed PET template together with the PACT.

Hypothesis and study design:

The sole hypothesis of this study (H1) is that four characteristics of the twin-templates (comprehension, ease-of-use, usefulness, and fairness) are the independent and predictor-variables that would collectively determine the dependent variable (acceptability), which would be a confirmation of the students' acceptance of the twin-templates as suitable instruments for generating and presenting fair assessments of their peers' contributions to group project assignments. Based on this conjecture, the study-model, indicated in Figure 1.1 (appendix 3), was designed to examine the relationships between the four independent variables (conceptualized as the "templates-characteristics" or TEMPX) and the dependent variable (conceptualized as "acceptability" or ACPT). Comprehension is defined as how understandable the templates were to the students. Ease-of-use indicates how simple or difficult they were to use. Usefulness indicates how necessary and valuable the students found them. Fairness indicates

the templates' ability to infuse open-mindedness and transparency into the peer-assessment process. Acceptability is defined by as the overall efficacy of the templates as determined by the students' intention to use them again and also their willingness to continue using them in subsequent GPW peer assessments. The collective relationship of these four predictor-variables (TEMPX) with the dependent variable (ACPT) would confirm the students' overall acceptance of the twin templates. In addition, given that the PA templates were trialed in the UK and the US, this study was also designed as a cross-national comparison between the perceptions of UK and US students on the fairness infused by the templates into their peer-assessment process. This was necessary because given that the US students used the templates to assess short-term GPWs in semester-long courses and that the UK students used them for long-term GPWs in year-long courses, a confirmation of the efficacy of the templates would therefore mean that they are suitable for peer-assessing both short-term and long-term student-led group projects.

Data Collection:

In two parallel surveys in the UK and US respectively, the same questionnaire testing the overall acceptability of the PA templates was administered on the students who had used the trial-templates. Its main focus was to find out the levels of comprehension, ease-of-use, usefulness, and fairness that the students associated with the PACT and PET templates. The study also sought to examine the ability of the four indicator-variables above to predict the fifth one, acceptability, and thereby to determine the two student-groups' perceived levels of acceptance of the templates. The UK students were surveyed via a web-based questionnaire between December 2009 and February 2010, while the US students were surveyed via an email-attached questionnaire distributed between March and April 2011 to the first set of student-users, and again between November and December 2011 to another group of student-users.

4. DATA ANALYSIS, RESULTS PRESENTATION, AND DISCUSSION:

Descriptive Analysis:

In the UK survey, only 96 usable responses (about 32% of the 300 students who tested the templates) were received by the deadline. These responses comprised the UK dataset. In the US, 108 useable responses (40% of the 270 students in the nine classes) were received in the US survey, constituting the US dataset. The respondents' demographic profiles are shown in table 1.1 (appendix 4), while the following is a summary of their response statistics:

a. Majority of the respondents in both countries had used both the PACT and PET templates together during the peer assessment trial (72% in the US and 83% in the UK).
b. 100% of the US respondents had used the PACT, while 23% did not use the PET.
c. 96% of the UK respondents had used the PACT, while 29% did not use the PET.
d. The 4% who did not use the PACT in the UK dataset said they would have used it if it were online. Most of those who did not use the PET said they either found it cumbersome or would prefer using it online.
e. Majority the respondents who did not use the PET in the US dataset said they did not see it or could not find it anymore after the first day (80%), while the rest said they would only have used it if it were online.

Scale Reliability:

The internal-consistency and construct-validity reliabilities of our measurement model were tested by means of Cronbach's alpha and the factor-loading scores of the four indicator variables. According to Hair et al. (2006), a reliable scale should have a Cronbach's alpha of at least 0.6, while values above 0.7 are considerably more desirable. At 0.8 and 0.9 respectively, the reliability results for UK and US data groups presented in table 1.2 (appendix 5) indicate that the measurement model of the study has high Cronbach's alphas for both datasets. The factor-loading scores for the four items (template characteristics) are also significant, although a much better result was achieved in the US dataset than in the UK one. However, both results confirm the model's internal-consistency and construct-validity reliabilities to be quite good.

Hypothesis Test:

As indicated by the conceptual model (Figure 1.1, appendix 3), the single hypothesis of this study (H1) asserts that the characteristics of the templates (comprehension, ease-of-use, usefulness, and fairness) would collectively determine the templates' acceptability (as measured by the students' intention to use the templates again and their willingness to continue using them). This hypothesis was tested by computing the standard multiple regression analysis in SPSS. Pallant (2007:p146) explains that multiple regression is "a family of techniques", based on correlations, "that can be used to explore the relationship between one continuous dependent variable and a number of independent variables or predictors." Two of the techniques were used in analyzing the relationships between the four independent and one dependent variable in this study. These including the chi-square test of model fit and the Pearson correlation coefficients in standard multiple regression. According to Cheng et al. (2006), the significance or otherwise of standardized regression coefficients determines the veracity or falsity of research hypotheses.

As presented in table 1.3 (appendix 6), the standardized coefficients in the multiple regression results indicate a very significant positive relationship between the students' acceptance of the templates and the levels of comprehension, ease-of-use, usefulness, and fairness they attributed to them. In addition, the regression chi-square results also indicate a good model fit, significant at 0.000-level. These results confirm not only the study hypothesis that the students' perceived acceptance of the peer-assessment templates was dependent upon the fact that they generally found them easy to understand, easy to use, useful, and fair in implementing peer-assessments in their group project assignments, but also affirm their intention and willingness to continue using the templates in future.

Comparison of the US and UK students' perceptions of the templates' fairness:

To determine the differences between the US and UK student-groups' perceptions of the fairness infused by the PACT and PET into the peer-assessment processes of short-term and long-term GPWs, the independent samples t-test analysis in SPSS was also computed, and the means of the two groups' responses on the fairness variable were compared. According to Pallant (2007:p232), the t-test analysis compares two groups on the significance of both their equality of variance (F-value) and equality of means (t-value). Sig-values of less than or equal to 0.05 indicate a significant difference between the means or variances of the two groups, while

values above 0.05 indicate that the difference between the means or variances of the two groups is not significant.

In the t-test results presented in table 1.4 (appendix 7), the sig-values for both equality of variance (F) and equality of means (t) are 0.6 and 0.8 respectively. Since the two values are more than 0.05, they therefore confirm that there is hardly any difference between the variances and means of the two groups. In other words, this indicates that there is significant equality of means and equality of variances between the UK and US students' responses on the fairness of the PACT and PET templates. The practical implication is, therefore, that both the UK and US students equally perceive the templates to be good instruments for infusing fairness in the peer-assessments of group project assignments, whether or not they are semester-long or year-long assignments.

5. CONCLUSION:

Summary of work and findings:

This study has proposed and presented two innovative peer-assessment templates known as Peer Assessment Criteria Templates (PACT) and Progressive Evaluation Template (PET). The templates were designed in 2009 and tested among two university student-groups in the UK and US respectively between 2009 and 2011. Results of the cross-national study conducted among the students who made the initial trial-use of the templates in the two countries have also been presented in this paper. The main aim of the study was to gauge the students' overall acceptance of the templates and their disposition to continue using it. Based on the foregoing research analyses and the general insights gained from the study-respondents, a summary of the study conclusions is presented as follows:

a) Majority of the respondents in the US and UK student-groups found the two templates useful, easy to understand, easy to use, and able to infuse fairness into any peer-assessment process in group course assignments (average of 78% in the US and 80% in the UK).
b) Both the US and UK respondent-groups perceived equally (mean = 1.22 and 1.21 respectively) that the templates possess the ability to infuse fairness into the peer assessment process of any group project work (GPW), be they short-term or long-term group projects.
c) 78% of the US respondents said they would continue to use the PACT and PET for peer-assessing GPWs if given the choice.
d) 83% of the UK respondents said they would continue to use the PACT and PET for peer-assessing GPWs if given the choice.
e) Most of the respondents who did not use the PET in both countries said they would have used it if it were online as that would have suited their convenience more.
f) On changes they desired about the templates, 71% of the UK respondents said that both templates should be used either offline or online just as they are; 13% said that only the PACT should be adopted; while 16% said they did not find both of them relevant.
g) 74% of the US respondents said that both templates should be used either offline or online just as they are; 4% said that only the PACT should be adopted; while 22% said they did not find both of them relevant.

By proposing the two templates in this study, the authors have also proffered a possible solution to the curricular problems often associated with peer-assessments in the pedagogy of business and social sciences, including the lack of assessment criteria to guide the students, the lack of proper documentation of progressive peer-evaluation through the GPW duration, and the lack of fairness that students often complain about in the whole peer-assessment process. Generally, the results of this post-trial survey have shown that both the PACT and PET are reliable complementary tools for involving students in active and fair peer assessments of their group project assignments - a vital strategy for enhancing student-centered learning experience in higher education. This paper therefore draws the overall conclusion that the two peer-assessment templates are viable interdependent tools for implementing peer assessments in any student-led GPW in any business or social science program and at any level of higher education.

Recommendations:

The prime suggestions of the student-respondents in this study are duly recognized. The students made it clear that using digital (online) versions of the PACT and PET would be a better way of using them rather than the paper versions that were trialed. Being as paperless as possible would make the usage of the templates more convenient for the students and also more environment-friendly. It is therefore recommended that the PACT and PET could be used either online or offline, depending on the availability of enabling technologies such as the Internet and institution-specific virtual learning environment (VLE) platforms. Interactive PDF-versions of the two templates could be uploaded and used on VLE platforms such as Blackboard or WebCT. On the other hand, the templates could also be transformed into interactive software that is incorporated into an institution's VLE as a permanent assessment tool.

To use the digital, interactive versions of the templates as tools in the VLE, all the students in each project team will need to sign up to one designated account that hosts their own group project work on a dedicated course-site in the VLE. Each member will have access to only his or her own folder that displays one dated interactive PET column at a time for assessing each member of the team. It will also have an interactive PACT template which will only be enabled by the teacher after the entire progressive evaluation process is completed at the end of the project. In each active PET column, the VLE will display the six evaluation categories for only one evaluation process after each group meeting. The team members will update their progressive evaluation records online and save their files after each meeting. At the end of the entire work period, the teacher will activate the PACT template and permit each member to provide final assessment grades for each person he/she has been evaluating during the work period.

The software will also synchronize the two templates and ensure that the final grades assigned with the PACT are in consonance with the evaluations and marks given throughout the work period, as recorded in the PET. Any grade entered in the PACT that does not conform to the PET assessment marks will be flagged up and rejected by the system. The system will equally prevent peers from seeing each other's folders and from changing any entries previously saved during the progressive evaluation. When completed, both templates for each assessed person will then be uploaded onto a central submission box for the teacher's preview and integration with his/her own tutor-assessment. According to Albon (2006:p.129), this kind of

online involvement will not only empower students, but also strengthen their goals as they will clearly know what they are expected to contribute to the group work. It will also eliminate collusion.

Lastly, until the fully interactive versions of the templates are available as digital software, the two templates could be used as savable MS-WORD or PDF forms to be completed by each student-assessor, saved, and later emailed directly to the teacher or uploaded onto the university's VLE submission box for the coursework. In universities and colleges where online submission, online feedback, and online grading of students' assignments have been fully implemented, the templates could easily be used alongside the other submission tools, enabling students to download them, fill them up, and upload them back onto a folder that only the teacher has access to. Finally, it is the authors' belief that when produced as fully interactive software, these two complementary templates will ultimately enable students to confidentially, independently, and fairly judge the contributions of their peers to group course assignments on a consistent and verifiable basis.

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APPENDIX 1A:
The Peer Assessment Criteria Template (PACT)

GROUP WORK PEER ASSESSMENT CRITERIA
AND ASSESSMENT FORM

- Use this form to record your objective and fair assessment of the contribution of each member of your group to the preparation and production process of your group's project/assignment.
- Your assessment must be based on the progressive evaluation record you kept during the course of the group work.
- Attach your progressive evaluation sheet for this particular member to this assessment form.
- For each assessment category below, award a mark that best represents your fair judgement of this person's contribution to the group work using the scale provided below.

COURSE TITLE/LEVEL: ……

GROUP: …… DATE WORK COMMENCED: ……..

GROUP PROJECT TITLE: ……..

STUDENT ASSESSED/NUMBER: ……

PEER ASSESSOR …… DATE: .....

TUTOR:: ……

MARKING SCALE:

			%
I.	Very poor contribution	-	0 – 29
II.	Poor contribution	-	30 – 39
III.	Weak contribution	-	40 – 49
IV.	Average contribution	-	50 – 59
V.	High contribution	-	60 – 69
VI.	Very high contribution	-	70 – 79
VII.	Exceptional contribution	-	80+

ASSESSMENT CRITERIA:

CATEGORIES:	MARKS (%)
1) Attendance at group meetings	---------
2) Initiating/contributing ideas at meetings	---------
3) Quality/usefulness of ideas contributed to team discussions/decisions	---------
4) Effectiveness in executing the portion of task assigned to him/her	---------
5) Attitude to teamwork/level of cooperation as a team player	---------
6) Overall contribution to final team situation	---------
TOTAL	----------
MARK AWARDED (Divide the above total by 6)	=======

(Tested in the UK in 2009/2010)

APPENDIX 1B:
The Peer Assessment Criteria Template (PACT):

GROUP PROJECT WORK: PEER ASSESSMENT CRITERIA TEMPLATE (PACT)

- Use this form to record your objective and fair assessment of the contribution of each member of your group to the preparation and production process of your group's project/assignment.
- Your assessment must be based on the progressive evaluation record you kept during the course of the group work.
- Attach your progressive evaluation sheet for this particular member to this assessment form.
- For each assessment category below, award a mark that best represents your fair judgement of this person's contribution to the group work using the scale provided below.

COURSE TITLE/LEVEL: …….....

GROUP: ……..…..…… DATE WORK COMMENCED: ……..

GROUP PROJECT TITLE: ……..……..……..

STUDENT ASSESSED/NUMBER: ……....…….....……

PEER ASSESSOR ……..……..... DATE: .....

TUTOR:: ……..…….....

MARKING SCALE:

		%
I. Weak contribution	-	0 – 59
II. Average contribution	-	60 – 69
III. Good contribution	-	70 – 79
IV. Very good contribution	-	80 – 89
VII. Excellent contribution	-	90 – 100

ASSESSMENT CRITERIA:

CATEGORIES:	MARKS (%)
1) Attendance at group meetings	---------
2) Initiating/contributing ideas at meetings	---------
3) Quality/usefulness of ideas contributed to team discussions/decisions	---------
4) Effectiveness in executing the portion of task assigned to him/her	---------
5) Attitude to teamwork/level of cooperation as a team player	---------
6) Overall contribution to final team situation	---------
TOTAL	----------
MARK AWARDED (Divide the above total by 6)	=======

(Tested in the US in 2010/2011)

APPENDIX 2:
The Progressive Evaluation Template (PET):

GROUP PROJECT WORK: PROGRESSIVE EVALUATION TEMPLATE (PET)

- This form is to be used by students engaged in group work to evaluate and record their peers' contributions to the group work process throughout the duration of the group work.
- Use only one sheet for each group member and make all evaluative entries for that person on the same sheet throughout the group work period.
- At the end of the group work period, attach this sheet to the peer assessment form you have completed for this person as your evidence of his/her contribution to the group work process.
- Do not use this form for self-evaluation. You are to evaluate only the other members of your group (and not yourself) after every formal group meeting.

COURSE TITLE/LEVEL: …….... GROUP: ……..…….... DATE WORK COMMENCED: ……
GROUP PROJECT TITLE: ……..…… TUTOR: ……..…….…… SUBMISSION DATE: ……..…
NAME OF STUDENT BEING ASSESSED: ……..…... NAME OF PEER ASSESSOR: ……

	Group meeting 1 Date: ……	Group meeting 2 Date: ……..	Group meeting 3 Date: ……..	Group meeting 4 Date: ……..	Group meeting 5 Date: ……..	Group meeting 6 Date: ……..	Group meeti Date: ……
1. Attendance:	Yes / No / Early / Late	Yes / No / Early / Late	Yes / No / Early / Late	Yes / No / Early / Late	Yes / No / Early / Late	Yes / No / Early / Late	Yes / No / E
2. Contribution to group discussions/ decisions:	Very active / Active / Passive	Very active / Active / Passive	Very active / Active / Passive	Very active / Active / Passive	Very active / Active / Passive	Very active / Active / Passive	Very active / Activ
3. Quality of ideas contributed:	* Useful - ☐ * Not useful - ☐ * None - ☐	* Useful - ☐ * Not useful - ☐ * None - ☐	* Useful - ☐ * Not useful - ☐ * None - ☐	* Useful - ☐ * Not useful - ☐ * None - ☐	* Useful - ☐ * Not useful - ☐ * None - ☐	* Useful - ☐ * Not useful - ☐ * None - ☐	* Useful * Not useful * None
4. Progress on portion of task assigned to him/her:	* Timely - ☐ * Slow - ☐ * Undone - ☐	* Timely - ☐ * Slow - ☐ * Undone - ☐	* Timely - ☐ * Slow - ☐ * Undone - ☐	* Timely - ☐ * Slow - ☐ * Undone - ☐	* Timely - ☐ * Slow - ☐ * Undone - ☐	* Timely - ☐ * Slow - ☐ * Undone - ☐	* Timely * Slow * Undone
5. Attitude to/in:							
(a) team meetings:	* Cooperative - ☐ * Uncooperative - ☐	* Cooperative - ☐ * Uncooperative - ☐	* Cooperative - ☐ * Uncooperative - ☐	* Cooperative - ☐ * Uncooperative - ☐	* Cooperative - ☐ * Uncooperative - ☐	* Cooperative - ☐ * Uncooperative - ☐	* Cooperative * Uncooperative
(b) team work:	* Committed - ☐ * Not committed - ☐	* Committed - ☐ * Not committed - ☐	* Committed - ☐ * Not committed - ☐	* Committed - ☐ * Not committed - ☐	* Committed - ☐ * Not committed - ☐	* Committed - ☐ * Not committed - ☐	* Committed * Not committed
6. Overall contribution to team effectiveness and final situation:	* Key player - ☐ * Satisfactory - ☐ * Free rider - ☐	* Key player - ☐ * Satisfactory - ☐ * Free rider - ☐	* Key player - ☐ * Satisfactory - ☐ * Free rider - ☐	* Key player - ☐ * Satisfactory - ☐ * Free rider - ☐	* Key player - ☐ * Satisfactory - ☐ * Free rider - ☐	* Key player - ☐ * Satisfactory - ☐ * Free rider - ☐	* Key player * Satisfactory * Free rider

APPENDIX 3:

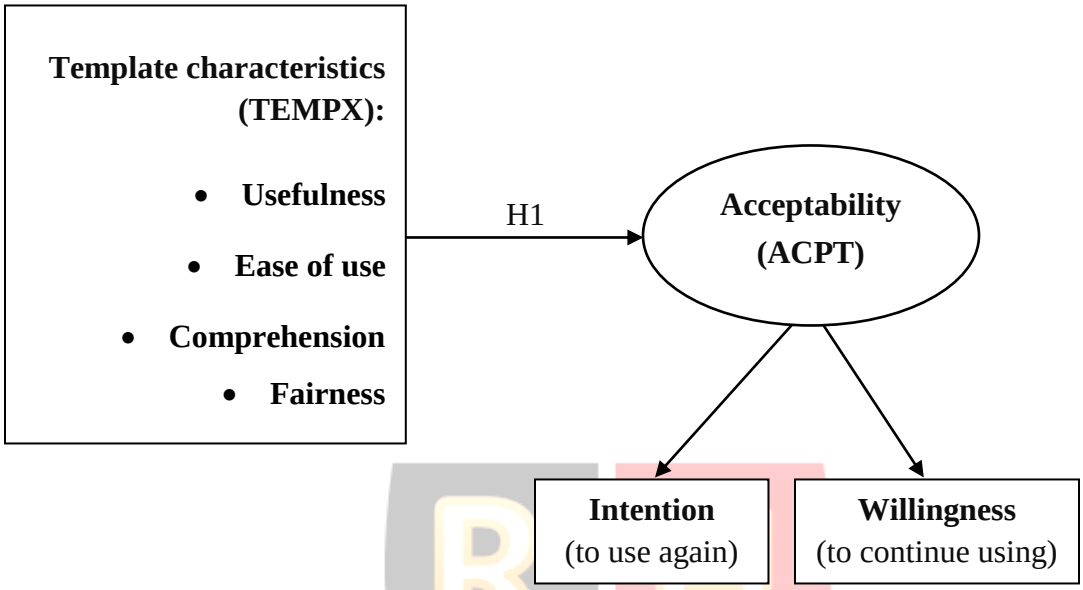


Figure 1.1: Conceptual model of the study

APPENDIX 4:

Demographic		UK Students		US Students		Total Respondents	
		N	**%**	***N***	**%**	**N**	**%**
Gender:	Female	58	60	44	41	102	50
	Male	38	40	64	59	102	50
Total (N)		**96**	100	**108**	100	**204**	100

Table 1.1: Demographic profile of the student-respondents

APPENDIX 5:

Construct	Item reliability		Composite reliability (Cronbach's Alpha)	
Recommended value	**UK** >0.5	**US** >0.5	**UK** >0.6	**US** >0.6
Template Characteristics (TEMPX)			0.8	0.9
• Usefulness	0.9	0.9		
• Ease of use	0.7	0.9		
• Comprehension	0.9	0.9		
• Fairness	0.7	0.9		
Acceptability (ACPT)			0.8	0.8
• Intention to use again	0.7	0.8		
• Willingness to continue using	0.8	0.9		

Table 1.2: Scale reliability (convergent validity and internal consistency) of the study model

APPENDIX 6:

Construct	Sum of squares						Standardized coefficients			
	UK			US			UK		US	
	X^2	df	Sig.	X^2	df	Sig.	Coef	Sig.	Coef	Sig.
Independent variables (TEMPX)	5.94	4	.000[a]	12.29	4	.000[a]				
• Usefulness							0.7	.000[b]	0.8	.000[b]
• Ease of use							0.5	.004[b]	0.8	.000[b]
• Comprehension							0.4	.003[b]	0.8	.000[b]
• Fairness							0.7	.000[b]	0.8	.000[b]

Table 1.3: Hypothesis test results: Chi-square and standardized correlation coefficients.
Note: a = Sig (2-tailed), b = Sig (1-tailed).

APPENDIX 7:

Statistics	UK N = 96	US N = 108
	Mean	**Mean**
• Fairness	1.21	1.22
F-value	0.23 (sig. = 0.6)	
t-value	-0.24	
df	202	
Sig. (2-tailed)	0.8	
Mean difference	-0.014	

Table 1.4: Independent samples t-test results on the fairness-perception of the UK and US groups