



Ref. No.

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**Projects on Promoting Outcome-Based Approaches in Student Learning
2007-08
Application for OBA Funding**

PART I: General Information

1. Title

The Creativity Assessment Project (CAP)

2. Name(s) of Applicant(s)

Project Leader

Name	Dept	Post	Groupwise	Ext.
Roy Horan	SD	Assistant Professor	sdroy	5440

Team Member(s)

Name	Dept	Post	Groupwise	Ext.
Siu King Chung	SD	Assistant Professor	sdking	5449
Eva Yuen	SD	Senior Lecturer	sdeva	6834
Keith Tam	SD	Assistant Professor	sdtam	5441
Brian Lee	SD	Lecturer	sdlee	8270
Wai Hon Wah	IC	Engineer, Head Technology & Design Studies Unit	ichwwai	4293
Ernest So	AMA	Visiting Lecturer	maernest	3400- 3907

3. Total funding requested

4. Expected duration of project: 25.5 months
Proposed commencement date: 01/04/2008
Expected completion date: 15/05/2010

PART II: DETAILS OF PROPOSAL

1. Project objectives and significance

(What are your objectives in initiating this project? How does it align with institutional goals and targets in implementing outcome-based approaches in student learning?)

Aim:

Creativity is a core competence set forth by the University's Strategic Objective 1. The aim of this project is to develop and test a methodology that can assess creativity across all domains within the University with respect to creative products, creative style and creative capacity in such a way as to enhance creativity within the student populace. This is a very challenging goal, one that has not been attained effectively in any other institution. Once completed, the repercussions within the education community are expected to be significant.

Definitions:

The prevalent definition of creativity is that it is the ability to produce work that is both novel (i.e. original, unexpected) and appropriate (i.e. useful, adaptive concerning task constraints) (Sternberg & Lubart, 1991, 1995, 1996). A less researched definition of creativity, often called *inner creativity*, is a subjective transformation of the self (Goswami, 1999). This definition is aligned with Buddhist, Hindu and Taoist concepts of man's discovery of his deep inner relationship with nature and attunement to natural processes guiding a spontaneous, creative life. Horan (2007) combines these two approaches by defining creativity as "*the manifestation of an intention to transcend the limitations of information*". Sternberg (2003), similarly, after many years of studying creativity, has concluded that creativity is primarily a decision. Joy (2004) supports the definition in a study indicating that creatives have a *need to be different*. Within the Eastern context, being different would indicate a need to be free from the constraints of personal limitations (eg. cognitive, affective, behavioral, existential, etc.). The motivation to be creative is primarily implicit.

The Challenges:

1. **Creative Contribution:** Creativity is a subjective phenomenon and any evaluation of creative contribution, to some extent, must be subjective. This does not mean, however, that such evaluation can not have objective validity within, or across, domains in which there exists consensus of what comprises a useful breaking of known patterns. Creatives are hired on the basis of their creative works all the time. However, studies (Amabile, 1979; Amabile, Goldfarb & Brackfield, 1990) have demonstrated that artistic and verbal creativity is negatively impacted in subjects who expect to be evaluated for their creativity. It is no wonder that creatives often abhor the concept of having their work evaluated. Creatives are intrinsically motivated and respond negatively (in terms of quality of creative output) to extrinsic motivation unless that motivation is either *informative* or *fosters additional creative endeavor* (Amabile, 1996). Therefore, any effective assessment system must provide an environment in which students are not threatened, or constrained, by evaluation; must somehow inform students of their creative process; foster additional creativity and motivate them to take chances, that is, develop the '*intention to transcend the limitations of information*' after which intelligence and normal cognitive factors play a role (Weisberg, 2006). These elements are often found in well-designed creative thinking classes where discussion, not evaluation, is a key component; certainly (to date) not within the assessment methods themselves.

A suitable outcome-based assessment method that enhances creativity would be invaluable. It also appears that many of the departments within the university do not directly assess creativity in their programmes/subjects because a) creativity has not been adequately defined in a way that can be assessed b) many subjects do not give students latitude in their assignments to develop their own ideas, except in the context of final projects c) group projects are often divided into roles where the group relies on the creativity of a single individual. A suitable outcome-based creativity assessment

method could enhance the implementation of creative endeavor in programmes/subjects that presently do not have such an element, and group creative work can be better delineated.

2. Creative Capacity: Once an education institution decides that creativity is a core competence, it must be implemented into various programmes. The common practice is to include exercises and assignments that require divergent thinking which involves formulating various solutions to a problem which diverge from the ordinary (Guilford, 1950), or through insight problem solving. The Torrance Tests of Creative Thinking are probably the most reliable instrument for testing divergent thinking (DT); yet, the only reliable conclusion over the past 50 years of research is that divergent thinking scores may predict creativity output in some individuals in some contexts only (Weisberg, 2006). DT, therefore, does not address the full definition of creativity. Insight problems tend to have a strong analytical component and may not actually involve creativity. An instrument that could extend the measurement of creative capacity beyond DT alone would be of great value in assessing creative capacity. This sort of measurement is of value to the university in both the recruitment process as well in designing programmes/subjects to enhance creativity as part of an outcome-based curriculum.

3. Creative Problem-solving Style: Different people solve problems in different ways. Kirton (1976, 1978) describes two creative problem solving styles: adaptors and innovators. Whereas, adaptors solve problems within the existing structure or paradigm, are resourceful, efficient, organized and dependable, innovators solve problems by creating a new structure or paradigm and are original, energetic, individualistic, spontaneous and insightful (Isaksen, 1989; Kirton, 1976). The Kirton Adaption-Innovation Inventory (KAI, Kirton, 1976), a self-report, has been used reliably to measure the differences. This instrument, however, does not shed light on the fundamental pedagogical elements that give rise to these styles as well as whether those elements are actually being applied. It is more useful to an educational institution to understand the development of creative problem solving style in the context of its various programmes pedagogical designs and their outcomes. For this, a suitable measuring instrument is required. The information it would provide could enhance the development of content that has creative problem solving as an outcome.

Potential Solutions:

1. Creative Contribution: A methodology has been developed for assessing creative contribution incorporating Sternberg's (2003) Propulsion Theory of Creative Contribution (defined herein as *creative scope*) and Besemer & Treffinger's (1981) analysis creative dimension categories and criteria (see Appendix 1.). Creative scope includes acceptance, rejection and the merging of existing paradigms within a total of 8 subcategories. These categories have been clearly defined by Sternberg. Creative criteria include types of novelty, levels of problem resolution, elaboration and synthesis. These two approaches have never been incorporated into a strategic assessment methodology, until now.

Our intended methodology employs the following basic procedures -

- The percentage of the creativity component in a project is determined.
- Projects are first assessed by the teacher for generic criteria and competencies, excluding the creativity component. This should not influence creativity assessment.
- The creative scope of the project is communicated to students.
- Creative assessment criteria are communicated to students, including appropriate rubrics.
- After completion of a project, students self-assess, and justify, their creative work in accordance with creative scope and criteria in a reflective, critical self-report. Their self-grade forms a significant percentage of the creativity component alone.
- Teachers assess the students' self-reports in accordance with separate criteria that do not involve a valuation of students' creativity (e.g. critical thinking, capacity for reflection, clarity of presentation etc.)
- Teachers also assess the students' creative work in accordance with creative scope and criteria; however, the percentage of the creative component assessment is low, providing students with the cognitive space to take risks. This part of the assessment is construed as a professional opinion, provided in conjunction with written/verbal feedback.
- This process may be streamlined for a creativity component that forms a low percentage of an overall project grade (e.g. below 10%).

The perceived teaching and learning advantages of the methodology are as follows:

- Students understand that there are different forms of creative contribution, some that accept existing paradigms, some that reject existing paradigms and some that merge existing paradigms (plus sub categories of these). They will learn how to apply this understanding. Teachers can design projects, subjects (and even programmes) that focus on different types of creative scope. Creative scope applies to all domains.
- Students understand that there are various kinds of creative criteria involving *types of novelty, levels of problem resolution, problem elaboration and synthesis*. In any project, they are not required to focus on all these criteria. In short, there are many more choices for creative endeavour. They will learn how to apply this understanding. Teachers can design their projects to address these criteria.
- Students learn to self-assess and reflect upon their creative works, their creative processes and especially their creative insights. Even if students decide to give themselves full marks, self-reports must justify the grade (e.g. using project logs, domain knowledge etc.). Students are not penalized for their creative works, but can be penalized for poor self-reflection and critical thinking performance. Without significant creative evaluative pressure, students are encouraged to take risks and foster their creative abilities. They are encouraged to develop a strong creative intent.
- A teacher, through reading student self-reports, can determine the student's creative intent and consequently understand whether a project suffers in intent, domain knowledge or experience (eg. technically insufficient). This allows teachers to provide more accurate grading of the project.
- Teachers' assessment of student creative work is not perceived as damaging, but instead as a professional, yet fallible, opinion which will be supported by useful feedback.
- Teachers still maintain control over project grades and can still fail students. Students who assess themselves as having demonstrated poor performance can still get a good grade if all other assessment is favourable.
- Students' self assessment is expected to improve with continued experience to match independent professional assessment (see section 3.b. below) because creativity is 'protected' thereby allowing room for critical evaluation.
- The assessment procedure can be simplified/modified depending on the magnitude of the creativity component and manner of the assignment.

2. Creative Capacity: Horan (unpublished) has developed and tested the Informational Boundaries Recognition Test (IBRT). This test requires subjects to ask as many questions as possible within a limited time frame (i.e. 10 minutes) when presented by stimuli consisting of very simple figures or words (eg. a circle, 'empty'). The questions are analyzed for question type and question domain. Question domains provide information on whether a question is attached solely to the visual stimulus (stimulus-locked), an abstraction of the visual stimulus, and/or exhibiting affective content (eg. elements of feeling, emotion or attitude in questions). The results of IBRT are analyzed for question richness (fluency, flexibility and complexity, where complexity demonstrates a layering of single responses over several categories). [Investigation into the capacity of IBRT to test originality of questions through statistical unusualness is in progress.] A preliminary trial of 17 college designers who were trained in divergent (lateral) thinking over three months suggests that IBRT can differentiate capacity and performance in figural and verbal modes, divergent thinking capacity (richness of questions), capacity for abstraction (level of question domain) as well as the complexity, or layering, of thought constructs.

Abstraction is known to be an important tool in creative thinking (Welling, 2007). It seems that, even with a few months of divergent thinking training, students become stimulus-locked and are less able to abstract when stimuli are simplified (eg. into a more basic component of perception or language...e.g. a point, the word 'a'), though divergent training does appear to increase fluency and flexibility. This implies that divergent thinking training alone is insufficient to enhance creativity. Creative professionals seem to have the ability to abstract even with very simple stimuli. The IBRT looks at the capacity to abstract while subjects consider what is yet unknown to them. In short, IBRT appears to

extend measurement beyond the domain of DT. The data also seems to predict the quality and nature of the mind maps created by students which demonstrate mental storage capacity, efficiency and capacity for forming associations in both verbal and figural terms (Buzan & Buzan, 2000) as well as creative works of both figural and verbal natures.

According to Horan's (2007) suggestion that intelligence and creativity are founded in the recognition of the limitations of information, the IBRT should provide a snapshot of the subject's ability to recognize what they don't know as a precursor to both creative activity and higher forms of intelligence. The test requires rating by trained personnel; however, training is minimal. The IBRT can be supplemented by a small exercise in which students actually create separately in verbal and figural modes. Together, a much clearer picture of student creative capacity is expected. It must be noted, however, that performance on these tests will improve with adequate exposure to the creative process in various domains. Students can be counseled independently, and as a class, on how to improve their creative capacity based on the information provided by the IBRT. Results of IBRT can assist teachers in designing their curriculum to enhance creativity as a core competence.

3. Creative Problem-solving Style: Horan (unpublished) has developed and tested an instrument, the Integral PsychProfile (IPsP), a 64 item self-report survey that divides cognitive behavior along eight (8) attributes. They are leadership, creativity, adaptability, organization, receptivity, discrimination, exploration and communication. These attributes can be traced to fundamental evolutionary precursors within simple organisms. They are also in alignment with the binary system of archetypes embedded in the ancient Chinese classic, I Ching. Preliminary investigation using IPsP on (20) college design students trained in divergent (lateral) thinking over three months indicated that, on the average, there was quite a complex shift in individual understanding and application of these attributes. [Note: programme variables were not controlled for in this study]. The project leader conducted this study based on the hypothesis that an adaption creative style combines the attributes of 1) exploration (desire to discover information within an information set, or paradigm) 2) adaptation (association formation based on intrinsic, and perhaps extrinsic, reward) 3) organization (reasoning, logic applied to information analysis) and 4) receptivity (self-awareness and contextual sensitivity) while an innovation style combines 5) leadership (desire to venture beyond the information set, or rejection of existing paradigms) 6) communication (includes ability to initiate and receive information from unconscious processes, then transmit such information externally) 7) discrimination (recognition/realization of appropriate solutions) 8) creativity (a preference, or need, for originality and surprise). The hypothesis also has roots in the yin-yang philosophy found in the I Ching; that is, the attributes are not mutually exclusive.

After training, the students' cumulative profiles indicated a shift occurred toward a greater balance between styles, with adaption eventually gaining a slight edge. This edge seems supported by students' already existing strength in exploration coupled by an increased awareness of the use of reasoning and method in creativity, but with insufficient ability, as yet, to apply their knowledge. This observation tallies with student reports as well as teachers comments on the effectiveness of lateral thinking tools in practice. They can be learned but are not often implemented in practice. Students that demonstrated a radical shift in style on the IPsP also reported major insights into, and alterations in, their problem solving approach. This instrument has the potential to provide valuable information to students about how to improve their creativity, *based on their existing strengths* (via the eight attributes); to help teachers design their teaching to enhance subjects and programmes in this core competence. The added benefit of the instrument is that it provides measurement beyond the scope of creative problem solving.

Objectives:

Based on the above, our objectives are as follows:

1. To formalize, and test, a strategy for assessing the creative contribution of students to assignments and projects.
2. To deliver a special technical report embodying methods for assessing creative contribution of students to assignments and projects.
3. To finalize, and test, the development of the IPsP as an instrument for measuring creative problem solving style. [Note: further development of this instrument into an online survey with automated scoring, though advisable for testing large groups of students, is beyond the scope of this project]

4. To finalize, and test, the development of the IBRT as an instrument for measuring creative capacity in conjunction with figural and verbal creative performance exercises. A manual for the administration of the test will also be prepared.
5. To develop a general education subject on creative thinking that provides a powerful teaching and learning experience embedded in the context of Chinese culture. This subject will also be designed to capture relevant research data which can be provided to students as feedback on their creative process, and its further development. Items 1, 3 and 4 will be incorporated into this subject. Furthermore, the subject will test a pedagogical strategy for the enhancement of creativity which can be applied in subjects across the University.
6. To work with two subject coordinators that manage subjects with a significant, but not predominant, creativity component, one within the domain of art/design and the other within the domain of science/engineering, in modifying (if necessary) their subject content, assignments, projects etc. to implement creative scope, criteria and problem-solving styles but without specific creativity training and to further test their validity for teaching and learning in this context. These subjects will be presented to the University as case studies.
7. To enlist a number of other subjects that will administer the creativity contribution assessment alone, without independent rating. These subjects will be able to test the reaction of students and staff to the assessment criteria across several academic areas.
8. To make recommendations to the University on the assessment of creativity in the form of an overall report and presentation.
9. To publish the findings of the project in various peer-reviewed journals.

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Welling, H. (2007). Four mental operations in creative cognition: The importance of abstraction. *Creativity Research Journal*, 19, (2&3), 163-177.

2. Target users

(Who are the intended users of the 'deliverables' of the project – faculties / departments management or programme/subject teams or students?)

The intended users of the deliverables are:

1. All faculties and departments within the university.
2. All subject coordinators managing subjects with a creativity component.
3. All students interested in creative thinking as a credit bearing subject
4. Educators within the Greater China region

If the target users are students, complete the table below:

Programme/ subject code	Programme/subject title	Credit units	Mode of study	Student intake quota per year
TBA	New GE subject to be developed - <i>Creative Thinking: The Chinese Way</i>	2	Interactive Lecture & Tutorials	100
SD3233*	Information Design	3	Lecture/Tutorials/Studio	35
SD3234*	Environmental Graphics and Interactive Media	6	Lecture/Tutorials/Studio	35
COMP322**	Enterprise Information Systems Project Implementation	3	Lecture/Tutorial/Lab	60
IC367***	Industrial Centre Training II	4	Tutorial/Projects	40
HTM510***	Training & Development in the Hotel & Tourism Industry	3	Lecture/Tutorial	25

Please insert rows in the table if more space is required for additional information.

*** These subjects are combined in one semester to form the art/design control subject.**

**** This subject is the science/engineering contrast subject**

*** These subjects will only administer the creativity contribution assessment without independent raters.

3. Outcomes and deliverables

(a) Major outcomes and deliverables

(What will be the major outcomes and deliverables of the project?)

	Major outcomes and deliverables with descriptions....
(a)	A technical report on methodologies for assessing the creative contribution of students to assignments, projects etc. including rubrics.
(b)	A developed, tested and validated instrument for testing creative capacity including the IBRT and creative performance exercises, including instructions for administering the tests. [Note: validation will be restricted to the sample sizes available in the project. Larger sample sizes can be addressed with further funding]
(c)	A developed, tested and validated instrument (IPsP) for assessing creative problem-solving style, including instructions for administering the test. [Note: validation will be restricted to the sample sizes available in the project. Larger sample sizes can be addressed with further funding]
(d)	A general education subject teaching creative thinking in the context of Chinese culture that is based on methods that enhance: understanding of creative scope, creative criteria, creative problem-solving style and creative performance. This subject will serve as a case study.
(e)	Development of two (2) subjects (one a multiple subject) as further case studies for creativity assessment, one within an art/design domain and the other in the science/engineering domain. A seminar will present results
(f)	A final overall project report, and presentation, on the assessment of creativity to the University
(g)	Publications will be undertaken and presented to peer-reviewed journals.

Please insert rows in the table if more space is required for additional information.

(b) Plan for developing and piloting / implementing the deliverables

(Detail the plan and procedures that you will adopt to develop and pilot/ implement the outcomes and deliverables. Also specify the dates of the pilot / implementation period)

Phase 1. - Development [April 1, 2008 – March 31, 2009]

1. Further design and development of the strategy for assessing creative contribution. This design will include rubrics for all criteria.
2. Further design and development of the IPsP
3. Further design and development of the IBRT and creative performance tests
4. Design of the syllabus for the GE subject on creative thinking.
5. Gain approval for the GE subject. This will require the support of SD, GE, the academic vetting committee (and perhaps senior management if it falls slightly out of the scope for most GE subjects)
6. Design of the subject content including lectures, tutorials, assignments and projects for the GE subject on creative thinking. This subject will be a collaborative effort of SD and engineering staff. It will be designed, most likely, with 1 hour of interactive lectures combined with general group and individual exercises followed by two (2) 1 hour tutorial groups, one targeted to students interested in the art/design domain, the other targeted to students interested in the science/engineering domain.
7. A pedagogical strategy, for enhancing creative thinking through assessment in art/design and science/engineering domains will be developed.

8. Co-designing with subject coordinators of two subjects, one from the art/design domain and another from the science/engineering domain, to design assignments/projects to be assessed for creative contribution. These students will also be assessed for creative capacity and creative problem-solving style. The primary difference in these subjects is that students will not have any special creative thinking training other than what is normally available to them in their respective programs. In such case, we can observe the effects of the assessment methodology without special training. We can also measure impact of the subjects' content on creative style and capacity.
9. Additional subjects from various departments will also participate by modifying their assignments to cater to creativity contribution assessment. These subjects will not use independent raters on student work. The purpose of these subjects is to gain a broader understanding of the assessment criteria within the university.

Phase 2. – Offering Subjects [January 14, 2009 – July 21, 2009]

10. Offer the GE subject on creative thinking. Students will be pre-tested and posted with the IBRT, creativity performance tests and IPsP within the first week and near the end of the semester. We will ensure that both tutorial groups listed above are about equal by informing students, in advance, of the nature of this subject, its research component, as well as a selection process based on their fields of study. Consent forms will be collected. Students will select which tutorial stream they wish to take. All exercises will be complementary across domains. Assignments and projects will provide options for students from either domain.
11. Offer the modified subjects within the art/design and science/engineering domains to students (about 60 students in total). Students will be informed of the research component of these subjects prior to registration. Consent forms will be collected.
12. Offer additional subjects from various departments to test the creativity contribution assessment alone, without independent raters. [Note: one of these subjects may be run in the summer of 2009 instead of the 2nd semester].
13. Ratings of the IBRT will be conducted by five trained raters. This will test inter-rater reliability of the instrument. Creativity performance tests that form part of the creative capacity assessment will be conducted by nine (9) raters using a Likert scale in accordance with Amabile's (1983) *consensual assessment technique*. This technique is a reliable technique for obtaining objective results but inhibits creativity when students are aware that their work will be evaluated. Here it is used as a control measure for the assessment strategy developed for this project. Besides the assessment of creative contribution provided by the teachers involving feedback to the students, a separate rating will be provided by nine (9) raters on students submissions. *This rating, used as a control measure only, must remain out of students' awareness and will not impact their scores.*
14. Scoring of the IPsP can be conducted by one individual. It is based on a Likert scale and can be automatically rated in EXCEL.
15. A student evaluation form, separate from SFQ, will be delivered to students after the courses are completed. This evaluation form will provide more detailed feedback from the students on their experience of the creativity enhancement elements of the courses, including assessment measures.

Phase 3. – Analysis & Conclusions [June 22, 2009 – May 15, 2010]

16. Statistical analysis of the results of IBRT, creativity performance tests and IPsP will be conducted for all subjects (see Evaluation section below for details).
17. Statistical analysis of the creativity contribution assessment methodology will be conducted for all subjects (see Evaluation section below for details).
18. Analysis of the student evaluation form dedicated to creativity related questions will be conducted.
19. Recommendations for enhancement of these measures will be made.
20. Recommendations for enhancement of the teaching & learning experience in the GE subject will be made.

21. Recommendations for enhancement of the teaching & learning experience in the art/design and science/engineering subjects will be made
22. Modifications to all the measurement instruments will be conducted if necessary
23. Modifications to the GE subject content will be conducted, for future offering of the subject.
24. Modifications to the implementation of the proposed creative assessment strategy in PolyU subjects will be considered.
25. A technical report on methodologies for assessing the creative contribution of students to assignments, projects etc. will be prepared, including rubrics.
26. A developed, tested and validated instrument for testing creative capacity including the IBRT and creative performance exercises will be finalized, including instructions for administering the tests.
27. A developed, tested and validated instrument (IPsP) for assessing creative problem-solving style will be finalized, including instructions for administering the test.
28. Presentations on the creativity teaching and learning elements of the case studies on GE, art/design and science/engineering domain subjects will be made to the University.
29. A final overall project report on the assessment of creative contribution assessment, creative capacity assessment and creative-problem solving style assessment and their effects will be produced.
30. Publications, on various components of the project, will be prepared and submitted to peer-reviewed journals.

Planned pilot / implementation period of the deliverables:

Start Date (dd/mm/yyyy): **01/04/2008**

End Date (dd/mm/yyyy): **15/05/2010**

NOTE: Detailed schedule on Microsoft Project is available upon request.

References:

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4. Dissemination and sharing plan

(How are you going to disseminate and share the outcomes and deliverables of your project?)

1. The IBRT, creativity performance tests and administration instructions can be disseminated to PolyU staff upon request to the School of Design.
2. Training in the rating of the IBRT can be conducted once a semester. It is at the School of Design's discretion as to whether a charge will be levied for this.
3. The IPsP and administration instructions can be disseminated to PolyU staff upon request to the School of Design.
4. Scoring of the IPsP must be done by a trained individual using EXCEL, until such time as the instrument can be delivered automated online.
5. The University must consider whether these instruments should be patented. The author is of the belief that this should be a recommended course of action.
6. The GE subject that is developed through this project can be offered on an ongoing basis. Eventually, it can be operated by one lecturer (and preferably one instructor considering the loading of assignment materials to be graded and the differences in tutorial content)
7. Seminars and presentations of the teaching and learning experiences of the GE and other subjects, as case studies, will be offered to the University.
8. A project report will be offered to the University, plus seminars and presentations on the measurement methodologies and use of various instruments will be presented to the University.
9. Publications for peer-reviewed journals will be provided.

5. Evaluation plan

(How do you plan to evaluate the effectiveness of the project, particularly its impact on the implementation of outcome-based approaches in student learning in the PolyU?)

1. The discriminant validity of the IBRT will not be tested in this project. To do so would involve conducting IQ tests (e.g. WAIS-R) and the Torrance Tests of Creative Thinking (TTCT) on students; this would take several hours and additional costs. Its face validity can be measured against the creative performance tests and creative works of the students; that is, higher scores on the IBRT should correlate positively with higher scores on creative contributions. This test may also help distinguish the validity of students' self-assessment of their creative work; that is, the self-assessment component may not adversely impact objective measurement of creative contribution. The predictive validity of the IBRT can be conducted by comparing pretest results, posttest results and student creative works. Inter-rater reliability will also be tested. The predictive validity of divergent thinking tests in measuring creative output is generally weak (Weisberg, 2006). It is expected that the IBRT with its abstraction and complexity of thought components will provide a better measure. Statistical analysis will be conducted by a professional in the area of psychometric testing. This instrument will help teachers to better design their subjects to elicit creativity as a key competency. It will also help students to understand their own creative process and how to enhance it.
2. The IPsP, in a previous version has undergone factorial analysis, correlation analysis, a study of norms etc. Pretest and posttest results have been given to students for their feedback. The profile has proven promising. Based on initial statistical analysis, the author is in the process of modifying the instrument. Its discriminant validity will not be tested in this project. To do so, it should be compared to the Kirton Adaption-Innovation inventory (KAI) which has a prerequisite for an education psychologist to be trained overseas in administering this instrument, which adds additional costs to the project. The IPsP's face validity can be measured against student evaluation reports on their creative works (eg. creative processes, kinds of insight etc.) as well as students overall evaluation of the subjects' creativity elements at the end of each course. These reports in conjunction with pretest and posttest results should also indicate its predictive validity with respect to creative-problem solving style. An additional test is designed by having in the unmodified subjects (no creativity training) to take the pre-posttest IPsP to adjust for programme/subject effects not related to creativity enhancement through assessment. A full validation of the instrument, across all attributes, would involve a battery of tests for the key attributes it also tests like leadership, discrimination, organization etc. which is beyond the scope of this project. The IPsP has value to OBE as a measure of how subjects/programmes are affecting student's problem solving abilities. Optimally, students should be encouraged to have the flexibility to solve problems in various ways depending on the nature and complexity of the problem. The IPsP also helps students to understand areas where they can choose to expend effort as self-learners.
3. The GE subject will be evaluated in terms of its capacity to align with the University's core competency (creativity), intended programme learning outcomes and subject teaching and learning outcomes. To do this, we will assess student performance and feedback as well as teacher performance and feedback. Teachers within the School of Design as well as EDC members will be encouraged to sit-in on GE classes to provide feedback on the way in which classes are conducted. Some portions of the classes, and some student feedback, will be videotaped. This material will be used as part of the overall case-studies. The creative thinking methodologies in this subject should have the capacity to be translated into many different kinds of subjects.
4. The art/design and science/engineering subjects will be evaluated on the effectiveness of their creativity components, and their alignment with subject syllabi, through student performance and feedback. Members of the project, from time to time, will sit-in on classes to assess delivery of creativity-related teaching content and delivery. Some portions of the classes, and some student feedback, will be videotaped. This material will be used as part of the overall case-studies. These case studies should inspire colleagues to consider how creativity can best be employed and measured within their subjects/programmes.
5. Evaluation of the subjects that only test the creativity contribution criteria will be conducted through both the teachers and student feedback as well as through quality of student works.
6. A further evaluation will be the number of inquiries, within the PolyU, related to implementation of project deliverables within the first year from project completion. This evaluation lies beyond the funding scope of the project, however, it will be made available to Department Heads and senior management.

- Information regarding the number of publications in peer-reviewed journals related to the project will be available in the School of Design.

References:

Weisberg, R.W. (2006). *Creativity: Understanding innovation in problem solving, science, invention, and the arts* (Hoboken, NJ: John Wiley & Sons)

6. Impact

(How will the project contribute to the success of the implementation of outcome-based approaches in student learning in the PolyU/ department/ programme/ subject?)

- The primary impact is that a methodology will be developed for outcome-based assessment of the creativity component that is applicable for all programmes and subjects within the University. In relation to this students will become more aware of their own creative processes, expand and deepen this awareness, and learn to apply the assessment parameters in their creative performance in school, and later in their careers.
- A method for testing creative capacity will be developed that can be used in the recruitment process, for assessing programme and subject outcomes in relation to creativity competency. This method can also provide students with valuable feedback on how to enhance that capacity (eg. flexibility, abstraction etc.)
- An instrument will be developed to understand the relative impact of core attributes that engender and support the creative process which will allow educators to adjust the problem-solving aspects of their intended programme and subject outcomes. This instrument can also provide valuable feedback to students on their creative style and how to balance their self-learning methods to elicit greater options for solving problems creatively.
- A pedagogical strategy and related methodologies will be developed for teaching creative thinking as a core competency in the art/design and science/engineering domains. This will help teachers and programme leaders to better plan their content to align with this core competency.
- The GE course that is developed within the project can be converted into a core subject for the upcoming four-year curriculum. In this way, all students will receive creative thinking training to enhance their capacity for success in the evolving creative economy.
- In that creativity is probably one of the most difficult competencies to fit within an outcome-based education system, this project has the potential to validate OBE at a very profound level.

7. Target date(s) for submission of progress and completion reports

	Planned submission date (mm/yyyy)
1. Progress report <i>(for projects whose duration lasts more than 1 year; to be submitted mid-way through the proposed project period)</i>	03/2009
2. Completion report <i>(to be submitted within 3 months after the project completion date)</i>	05/2010*

*** NOTE: Except for preparation and delivery of seminars, all deliverables should be completed by Feb. 18, 2010.**

PART III: BUDGET OF PROPOSAL

***Important Notes**

1. Funding requests for equipment and/ or software will be considered only if:
 - a. the equipment / software is essential to the successful implementation of the project, AND
 - b. it is not available in the department concerned. The Project Leader has the responsibility to check this out.
2. The purchasing policies and procedures of FO must be followed for the procurement of approved items.
3. Funding request for conference attendance will not be considered.

Project Leader

Name: Roy Horan Signature: 

(in block letters)

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Dept: School of Design Date: 31-01-2008

PART IV: DEPARTMENTAL ENDORSEMENT

Endorsement by Chair of FLTC/ DLTC:

Comments on the proposal:

SECOND PRIORITY

Name: FUNG HO YIN Signature:  Date: 31/1/08
(in block letters)

Endorsement by Dean/ HoD:

Comments on the proposal: *This is an excellent proposal with a fully competent team. This work is so important to PolyU as a whole; Hotel and Tourism, Computing and other areas of PolyU are interested in learning how to assess Creativity. This area of work will also combine with Research in the School of Design to ratchet up our expertise in Creativity, something very important for the economic stimulus of Hong Kong and China. This work will help individual faculty to increase their*
By endorsing this proposal, I agree that: *Research Output.*

1. The proposal suitably addresses the School/Department's needs in promoting and implementing outcome-based approaches in student learning and will be considered as part of the School's/Department's Business Plan.
2. The School/Department will receive a funding as calculated for item (e) in the Budget section which I will use for providing the time release recommended by the project proposers, based on the Total Workload Model, to support them to work effectively on the project.

Name: Lorraine Justice Signature:  Date: Jan. 31, 2008
(in block letters)

Please return this form to Miss Miranda Fung, Secretary of Working Group on Outcome-based Education,
c/o Educational Development Centre
by 31 January 2008

Supplement to the OBA Proposal – The Creativity Assessment Project (CAP)

Justify the budget for the lap-top computer

- Part-Time Visiting Lecturer (PTVL) is required to assist in teaching the GE subject, especially for tutorials. This individual will be trained by project academics to carry on teaching/supporting the subject for future academic years. We assume that the subject will be a valuable asset to the university and perhaps even a potential core subject for the 4-year programme.
- The laptop is for the PTVL to use for teaching. The School of Design does not have a spare for this purpose.

Mr. Roy Horan [SD]

14th April 2008