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A STUDENT-CENTERED APPROACH TO IDEAS GENERATION FOR PROJECTS: IS IT A THREAT TO CREATIVITY AND INNOVATION?

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ABSTRACT

The conceptual framework of the nature of learning in final year undergraduate projects (FYP) has not been clearly defined. Fostering creativity in undergraduate projects, and particularly in their proposals for the projects is challenging. Defining what is viewed by assessors as 'creative' can be less precise than other features, such as feasibility and resourcing. This study focused on supports given to students in developing high quality proposals for their FYP in computer science, and the supports for teachers to assess this new feature. Providing these supports requires development of new approaches, as assessment of the proposal is not a common practice in other universities which offer undergraduate programme of Computer Science. A new assessment rubric for evaluating the proposals was developed for both teachers and students, and material extracted from past project proposals (of differing quality) was mapped to the assessment criteria and presented as an online support system. Student and teacher feedback was gathered at all stages. The concept of combining and reorganizing existing knowledge to produce creative ideas is discussed, and both the literature review and the research findings from this study may be of value to researchers interested in FYP and teachers wishing to develop such modules.

Keywords: final year project, student –centered, creativity, assessment, inquiry-based learning.

1.0 INTRODUCTION

There is no universally agreed definition of the term 'project'. Often in higher education, it is a requirement for undergraduate students to undertake a research project with independent study and problem-based learning as part of their final year of study (FYP). This is done in the final project to measure student's higher learning level skills to be able to create, analyse, evaluate and be critical. Students' final year projects can cover a variety of activities and different types of inquiries. The project can be done to explore a new approach to solving a problem; analyse an existing approach and improving it; implement a theory; extend on-going research, or apply a theory to a practical problem (Brynard & Hanekom, 1997). All research projects will require a large amount of independent study which will be monitored or 'assisted with tutoring to a one-to-one basis' by respective supervisors (Stefani & Nicol, 1997). Hence FYPs have a significant impact on student's learning. The fact that the FYP is ill-defined and less structured than other learning activities in undergraduate courses allows a good opportunity for students to explore and expand their creativity, especially when they are

given freedom to decide which research topic to propose. The supervisor plays a very important role in making sure that students benefit from this process, but this also poses some challenges to the other stakeholders, which will be addressed in this paper. The question arises as to how creativity can be fostered in undergraduate students, and its role in research problem formulation as part of the nature of learning in final year projects. From the educational context of the research, this study provides a different perspective on how research on final year projects for undergraduate degrees can be approached.

2.0 LITERATURE REVIEW

Within FYP, the students are exposed to a form of active learning. This is shown by several studies on final year projects. In the US, it was identified as a high impact activity (Kuh, 2009). In New Zealand, student engagement was the highest (O'Steen, Perry, Cammock, Kingham, & Paswon, 2011). In the UK, these projects provided more enquiry-based activities that supported active learning approaches (Childs et al., 2007; Levy & Petrulis, 2012).

As suggested by Healey (2005), when undergraduates are actively involved in their research they will participate in various forms of inquiry-based learning. She addsthat "Inquiry-based learning (IBL) has always been associated with final year projects" (p. 183). IBL have been carried out with groups, as in problem-based learning; project-based learning and case-based learning (Aditomo, Goodyear, Bliuc, & Ellis, 2013).

It is mostly development where research comes in the form of background study of the problem, existing solution and their proposed solution. These affect the design, implementation and the evaluation stages in their FYP's cycle which is part of the aim stated in the degree programme specification. Therefore, as part of the FYP requirements, students are given the freedom to propose projects of their choice. Students will be assigned a supervisor and are required to complete the project within a given time. In order to complete the task, students will need to have a fair amount of research as listed earlier to ensure that they proposed solution to the problem their stated is sound enough and at the same time acquire the knowledge to get it done.

As a result, students are creating new knowledge and acting as active participants in the creation of meaning and knowledge (Baxter Magolda, 2008; Levy & Petrulis, 2012). The tasks designed can cover a variety of approaches, and with this freedom of choice, students were found to learn best pursuing their own research projects (Turner, Wuetherick & Healey, 2008), due to a sense of ownership for their project. The project is perceived as their "baby", which if successful, is usually used in their curriculum vitae when applying for jobs. Therefore, the FYP curriculum needs to be set up in such a way that the student has to devise an area of research that is interesting, and which also enables her/him to reflect on their strengths and capabilities. The research experience should nurture students to gather relevant and related information, to explore a variety of ideas, to make an association with existing knowledge, and to gather new knowledge to make new discoveries by means of proper research. The correct line of inquiry is a powerful factor to engage towards knowledge building (Levy & Petrulis, 2012).

The students' learning in the final year project is optimised with realistic problems, which allows them to think and practice like experts in the field, and at the same time also exposes them to experiential learning (Stieff, 2003). In experiential learning, a sequence of processes

will cover steps from problem definition, analysis and understanding of the problem, identifying options to solve the problem, selecting the most appropriate option, implementing the chosen solution and finally evaluating the result (Lee, McGuiggan, & Holland, 2010).

These students' learning approach are also in line with those needed by the 21st century graduate, hence, there is a need to align the students' experience with their academic interests (Hill et al., 2011), and to prepare them for the challenges and opportunities facing them in employment (Friesen & Scott, 2013). Students in the undergraduate level entering FYP in their final year will need some assistance before they can develop autonomous learning (Hurd, 1999; Todd et al., 2004). Focus on areas such as on teaching and learning methods and assessment must be addressed. Students and supervisors both need to be flexible. As stated by Healey et al. (2013), "FYP give universities the opportunity to provide high quality student-centred learning involving supervision and advice" (p. 7), where the supervision also needs to embrace these ideas in order to ensure success.

One of the crucial factors that could contribute to this success is the student's empowerment, where freedom of choice was given to them when proposing their project for the FYP. Previously, Institut Teknologi Brunei's students used to select project titles which had been suggested by the supervisors, but as freedom is given to the students, they can reflect their interests, motivations and career aspirations in their choice of project. Therefore, in order to encourage students to use their initiative, the FYP guidelines need to provide this structure, which includes essential features needed to meet the learning outcomes with some characteristics as listed by Healey et al. (2013).

2.1 Creativity and Problem Formulation

In addition to having the necessary 21st century skills, traits such as creative innovation and problem-solving, are what employers are seeking in new employees, and so students need to acquire these for their professional development. Creative problem solving is the ability to resolve a problem by recognizing a combination and reorganizing the existing knowledge structures (Mumford, Connelly, Baughman, & Marks, 1994). Studies of creative problem solving mainly focus on three distinct form of knowledge structure: (1) schematic knowledge, (2) associational knowledge, and (3) case-based knowledge. These knowledge structures provide basis, and are commonly considered integral to creative thought (Clement 1988; Davis, 1999; Hunter et al., 2008). Creative problem solving can occur by incorporating new elements to these three forms of knowledge structures (Kolodner & Simpson, 1989). Furthermore, transformation by means of reorganizing and rearranging the elements of prior problem solutions can also contribute to creative problem solutions that are both original and high quality (Rich & Weisberg, 2004).

In applying these knowledge structures in idea generation or creative problem solving, encouragement by means of intervention programs are developed, such as brainstorming for associational knowledge, morphological synthesis for schematic knowledge, and direct analogical thinking for case-based knowledge (Davis, 1999). Another means to encourage and refine the creativity is by limiting and narrowing focus (Coskun, Paulus, Brown, & Sherwoord, 2000; Nijstad, De Dreu, Rietzschel, & Bass, 2010) by constraining the domain of interpretation to help students to pursue an appropriate line of reasoning (Stokes & Fisher, 2005). In addition, explicit instructions will also generate more creativity (Shalley, 1991). Therefore, in order to cultivate and stimulate creativity amongst students with their FYP, there is a need to consider the kind of intervention, constraints and explicit instructions to be implemented within the FYP structure.

Students, as well as assessors, need to realize that different approaches or strategies may be necessary for solving different types of problems and for finding problems in various domains. Strategies will differ from one situation to another. This is where research and inquiry skill are essential. Hence, it is important for the students to have the necessary knowledge foundation and at the same time retained flexibility and sensitivity, which is necessary for creativity (Runco, 1994). Therefore, it is important to prepare students with these skills. FYP provides the opportunity to nurture and enhance these traits as Donnelly (2004) states, "Being able to work creatively will, in turn, help their students survive and thrive in this world, and help them lead more satisfying and meaningful lives" (p. 160).

2.2 Learning From Exemplars of Previous Projects

The use of exemplars can focus discussion between students and teachers, and this may lead to a transfer of good understanding of the requirements of the assessment criteria. By using exemplars as key examples, students can contextualize and understand what each criterion means (Sadler, 1987; Orsmond, Merry, & Reiling, 2002). In a study using portfolio assessment, examples of previous portfolios were ranked more helpful in teacher education compared to other resources (Woodward & Sinclar, 2002). The rest of this section will focus on three empirical studies on the use of exemplars where the approach differs in the extent of how exemplars were used in their studies.

From the Orsmond et al.'s (2002) study, the exemplars were presented as illustrations of different design styles of posters without comments on the merits achieved. By introducing exemplars to each specific criterion, possible bias between tutor and student marking was avoided. Discussion with tutors and the construction of the marking criteria in the presence of exemplars allowed students to enhance the quality of their learning. The use of exemplars expedited improvements in the quality of the formative feedback given to students. Using exemplars to each criterion ensured students and tutor to have the same understanding of them, and also the marking standard in the context of the subject matter (Orsmond et al., 2002).

In another interesting approach by Handley and William (2011), an online facility was used that enabled students to view exemplars. The exemplars were marked-assignments similar in structure, but different in topic, to the ones that the students would be doing, and this approach was similar to the work done by Hendry et al. (2011). In this study, the students could 'see' how that explanation translates into a real example. Qualities visible to tutors might be invisible to students; therefore, the study suggested some degree of tutor planning in the selection of exemplars. Exemplars in terms of "constructed excerpts may be appropriate when students are learning to 'see' criteria for the first time" (Handley & William, 2011, p. 105). This can be used to understand important assessment criteria and standards that are difficult to explain. The excerpts can also be used for students and tutors to ensure consistency in marking. The study suggests further research on design exemplar activities, whether to construct exemplar assignments or use authentic student work; whether to use complete assignment or only those parts which illustrate specific criteria; and on how to generate debate in order to deepen students' understanding of the assessment criteria so that they develop their own skills of self-assessment (Handley & Williams, 2011).

Transparency in assessment processes was also another aspect that was mentioned in the literature with respect to assessment criteria and exemplars. In giving out assignments, students should be notified of the assessment criteria and standards beforehand so that they

can formulate and work toward those criteria and standards. Discussion of marking criteria has been shown to be useful in helping student learning (Klenowski, 1995; Stefani, Clark, & Littlejohn, 2000). Students learn best when performance goals are made explicit (Aleven & Koedinger, 2002; Campbell, Kaunda, Allie, Buffler, & Lubben, 2000). In designing a course, teachers in higher education need to be aware of how student learning occurs. There needs to be clarity of goals and teaching and assessment methods to allow students to achieve high quality learning outcomes (Prosser & Trigwell, 1999).

3.0 METHODOLOGY

The users' requirements, specifically the students' requirements, were gathered through the administration of questionnaires, and this has been reported in Haji Suhaili (2015). A total of 149 final year Computer students from four different cohorts at Institut Teknologi Brunei (ITB) completed the questionnaires about their needs for support in writing research proposals, and 16 of them were interviewed. Eight teachers of this class were also interviewed and seven students piloted the prototype of the online support system (eGuide) at all stages. From the factor analysis done on the 30 items available in the questionnaire, they were reduced and grouped into five factors that would most benefit the students in their project proposal quest. These five factors mapped to items that had been identified and categorised under the following: (1) rubric (marking criteria), (2) checklist (procedure), (3) exemplars, (4) project guidelines, and (5) supervision. These five areas represented the areas that had been incorporated in the study. These requirements were further strengthened by collecting qualitative data from the supervisors via interviews. This approach proved to be effective and efficient, as all the stakeholders were directly involved in the overall research process from the start to the end of the study.

4.0 DATA ANALYSIS AND DISCUSSION

4.1 The Assistance Required by Students

The students' views were predominantly in favour of the preferred solution focusing on the assistance required. Three main areas asked in the questionnaire will be the focus of this part of the discussion - *ideas, marking criteria* and *valued features* that would assist students in their quest of developing and authoring project proposals.

The assistance with developing *ideas* for a project topic for the students could be achieved if the *idea* was of interest to them, the assistance could help them in obtaining *ideas*, and if the assistance could demonstrate what was required and expected from them (in how the *idea* should evolve and on how it should be presented). In the final year project requirements, students were free to submit proposals from their own *idea*, from supervisors, or even from industries. This would ensure that the proposed project would be of interest to the students, which is consistent with the studies by Bereiter & Scardamalia (1987) and Rust (2002), which suggest that students greatly value authentic writing tasks. Students preferred authentic assignment tasks that enabled them to acquire valuable knowledge for their future career. This was highlighted by the ITB students for all of them acknowledged that the creation of proposals in the final year project exposed them to requirements in the real world. Also, there are national competitions, such as Brunei ICT award (BICTA) and The Crown Prince CIPTA award, and regional competitions, such as Asia Pacific ICT Alliance award (APICTA) that students have joined as a follow up from their final year projects. This became one of the motivational aspects for the students to come up with good projects.

The questionnaire also revealed the students' preferred *valued features*. They stated the preferred *valued features* that should be accessible to them were on the proper procedures, human expertise/professionals/aspect of supervisors, and guidance on how the project proposal should be.

Hence, the design and creation of an online guideline in the form of content management system was developed, known as eGuide. The eGuide possessed important attributes that were regarded as essential tools to assist students in their task of writing project proposals. It supported learning by specifying and explaining steps to take and provides the flexibility that allows the students direct access to any or all of the related materials without needing to go through a pre-defined sequence. For example, if a student already has an idea that falls in the area of multimedia, they can just select this area and go through those exemplars.

Four main components that made up the project proposal were emphasised: (1) Project Description in Introduction, (2) Study on System and (3) Project Effectiveness in Background study and (4) Project Flow in the Methodologies. These became the initial components that made up the assessment criteria. Samples of previously submitted proposals were provided in eGuide as exemplars, so that students could study the various approaches that had been used to present these components in the project proposals by previous students. In the final year project development, as there was no concrete syllabus to adhere to and no fixed lectures to attend, instructions were provided to frame and standardize the requirements of the projects, and at the same time taking care that the instructions did not restrict the students' freedom in the choice of idea for their project.

The rubric, checklist and exemplars helped students to develop the points required in their proposals and to articulate their train of thought. With exemplars, students were able to view samples of previous years' work to reinforce their acquired knowledge and to apply this understanding to their own proposals. However, the literature suggests that there is a risk with supplying samples of written texts to students; they may adopt a strategic approach to emulate them without actively engaging in meaning-making (Norton, 2004). This was found not to be the case in this study, as each project that the students who used eGuide proposed was unique.

For the FYP, students were free to choose any topic as long as it was related to the computing field. The availability of the previous samples of project proposals assisted the students in generating ideas and enhanced their confidence in acquiring knowledge of the unknown. By referring to the samples from the refined corpus of the submitted project proposals, students were able to structure their ideas. The rubric was transformed to a checklist, in the form of an outline map (mind map), that could be used to help students to visualise, construct and expand their ideas as required. The use of the mind map enabled an idea to be fully developed and later be presented into a proper proposal. The structure in the eGuide offered flexibility for the students to acquire knowledge and understanding. They were not limited to only referring to the full document of each project but they could also view it as small sections, 'snippets', which focused on individual rubric criteria and the individual tasks involved in the form of a checklist. Suggestions as to how to improve the previous proposal being viewed by the student, as a whole and also the snippets, were also provided. The study emphasised the value of samples to provide important opportunities for familiarising and strengthening the students' understanding of the conventions of project proposals and their assessment.

The students agreed, and emphasised, that having the samples helped them to generate ideas and to understand the assessment criteria. These were particularly helpful for understanding the required conventions and their tutors' expectations. Additionally, the samples illustrated important information about the structure, organisation of materials and technical conventions such as the length of the chapters and referencing (Poverjuc, 2010).

4.2 Evolution of the rubric to marking criteria

Unfortunately, a proper breakdown on how the Degree FYP would be assessed was unavailable. In separate informal interviews with the supervisors, they expressed the view that they were keen for a rubric to be developed, and that assessment marking criteria was needed for the research proposal in the Degree FYP. The supervisors needed to be provided with assessment marking criteria to assess the student's work and to use as a checklist to help them to provide assistance to the students under their supervision. Hence, this requirement for assessment marking criteria would not only assist the students, but the supervisors and the proposal assessors as well.

The formulation of the rubric aimed to make it simpler for the students to understand what was required of them, and for the supervisors to use it as their reference in assisting their supervised students. This was designed in the form of a checklist. The design of the rubric, in the form of a checklist, was revised and adapted to meet the needs of students in authoring their project proposals (Taggart & Wood, 1998). The checklist covered the essence of the required elements of a proposal and is similar to a 'book review rubric', where the aim is to introduce students to the world of professional writing, and the stages related to the professional activities involved in reviewing a book (Steven & Levi, 2005). The rubric as a checklist can be viewed as an instructional strategy. Several researchers (Mayer, 2003, 2004; Sweller, 1999) have identified that instructional strategies help make students' understanding more explicit to themselves and promote appropriate processing in learners. At the same time, the rubric should be able to provide informative feedback about their strengths and areas that need improvement (Andrade, 2000). This approach reinforced trust between students and supervisors, and allowed for a more objective evaluation (Turner, 2009). The checklist summarized the steps one needs to take in order to expand an idea into a full research proposal.

Initially, as there were no proper learning materials for FYP module, the exemplars from previous (HND) project proposals were used to illustrate what to do and what to avoid, and to highlight how to improve. The strength of using exemplars has been proven in many studies. Different approaches were used but all with the same purpose of contributing to the students' learning. In this study, all the existing previously-submitted project proposals (the corpus) were selected and transformed into suitable learning materials as exemplars, and exemplars were provided for each assessment criterion in the form of snippets. These transformations enabled the corpus to become useful materials to enhance the students' understanding of the rubric and checklist. The use of exemplars was aimed to avoid confusion about the assessment requirements and to build the confidence of the students.

The way the eGuide was designed, evaluated, and then further shaped by the students to develop and enhance their learning opportunities. The availability of the corpus provided opportunities to illustrate how each criterion might be expressed. A range of studies (Bell, Mladenovic, & Price, 2013; Hendry & Anderson, 2013; Hendry et al., 2011; Newlyn, 2013) demonstrated the success of using exemplars in providing constructive guidance and

improving students' performance. The same technique was adopted in this study where the availability of the exemplars complemented the student's knowledge of each criterion.

The research proposals submitted by the first Degree cohort was added to the existing corpus. They had been produced before the assessment criteria were developed and converted into a rubric, and so they were mapped onto the assessment criteria to be used in Year 2 of the Degree programme. The use of the transformed corpus from the first Degree cohort gave new examples of how different ideas might be developed into project proposals and some examples of the different ways of presenting proposals. All were based on the newly created assessment criteria for the Degree FYP proposals. Students could make full use of the available samples to generate ideas and shape their writing. Mayer (2004) states that:

> meaningful learning occurs when the learner strives to make sense of the presented material by selecting relevant incoming information, organizing it into a coherent structure, and integrating it with other organized knowledge. It follows that instructional methods that foster these processes will be more successful in promoting meaningful learning than other instructional methods that do not (p. 17).

Examples were also used in a study done by Chi, Bassok, Lewis, Reimann, & Glaser (1989) where the use of examples was classified into three categories; reading; copying and mapping; and comparing and checking. Examples were used as a guide and some examples provided ways to find a solution. These were also some of the purposes of my exemplars. A variety of examples was made available for the students in different forms: as a full document, snippets, mind map images, or the students could select from various fields or to the specificity of the tasks required within the rubric. Students could also choose any of the available exemplars in terms of text, which were taken from the corpus or in terms of mind map images that were made available to assist them in visualising the requirements of project proposals. The use of snippets was also used to test students' knowledge, a feature also made available within the eGuide.

By making references to the samples of past student work, the students were made aware of how to construct acceptable research proposals, that would meet the assessors' requirements. The assessment criteria, together with the use of exemplars from the previous samples, enabled the students to focus on the sort of elements required for expanding their idea into a viable research proposal. Moreover, this exposure strengthened and enhanced the students' confidence in having the knowledge of what sort of expansion an idea should be exposed to. It also provided opportunities to construct new knowledge and to acquire the appropriate writing norms. Hence students found these exemplification materials useful as they gave explicit insights into how an academic report was structured and what could be counted as good academic writing.

The FYP should provide the base to enable students to be creative, to explore, and to expand their imagination underpinning all the knowledge that they have gathered throughout the years. Also, in order to support and encourage creative thinking for these students, the assessment criteria should cover aspects of creative thinking as well. This is in line with Donnelly (2004) who contends that:

> worthwhile and desirable goal for higher education and any programme can be vivified to make it more favourable to fostering creativity. … If higher education is to promote creativity it must reflect upon the realities of its

> students, discuss how these realities can be utilized to enhance creativity, as well as engage in activities that encourage creativity (p. 162).

Ruscio and Amabile (1999) also add:

> If the goal of problem-solving instruction is to enable students to utilize existing skills in an independent, flexible, and innovative manner when faced with novel problems, the heuristic approach to instruction appears to be the most likely to succeed (p. 264).

Since FYP within this context provides the opportunity for students to devise projects of their own choice, proper instruction needs to be provided. The curriculum design should provide the opportunity to allow students to discover their potential and to achieve higher levels of creative expression (Anderson, 1990). Within the ITB Department, the students will propose a project, and produce the outcome within the software development life cycle where with this, students are participating in all the project cycle from the start to finish, which benefitted the students as agreed by Shore (2005).

In order to formulate a problem, experts spend a significant amount of time framing the problem prior to engaging in modelling activities, and information gathering takes place throughout the process (Atman et al., 2007). This needs to be implemented when developing the FYP curriculum to enable students to produce a good problem formulation.

> if we teach students how to appropriately gather information about a problem's context, just like experts do, we can hope that they will gather information that allows them to see the aspect of the problem that, when combined with what they already know, enables the chance, the surprise, the design of a creative and innovative solution.
>
> (Atman in Editorial board of IJDCI, 2013, p. 21)

Although this can be expected by some of the students, they will always come up with new ideas if the notion of creativity by Donnelly is used as claimed:

> The most common kind of creativity is conceptual replication, whereby someone produces a minor variant of work that has been produced before. … Most successful inventions and scientific discoveries represent 'forward incrementation' which basically takes existing ideas and moves them to the next step in the direction the field is already going.
>
> (Donnelly, 2004, p. 156)

At the start of the design process, several questions were derived based on the research questions, focusing on the rubric and the transformation of the corpus as exemplars to become the learning materials. Therefore there was a need to understand the nature of final year projects and to look at how much they differ from those at other higher educational levels, for example in post-graduate masters, by research and by taught courses, and in doctorates. My study focused on the undergraduate degree and further narrowed it down to ways in which the proposal stage might be assessed. This was important, as assessment of the proposal stage was not common practice in any of the other universities in the field of computer science at the undergraduate level, as far as I could ascertain.

At the same time, the study also provided insights into the different areas of these types of projects, for example depending on the programme area from internet computing, creative computing, multimedia, security, network and computing. This has opened up connections

between this topic and other areas of the literature, such as inquiry-based learning, which then link to fostering creativity in formulating problems. This is required especially when the project proposed has an interdisciplinary nature. The concept of combining and reorganizing existing knowledge structure to produce creative ideas was discussed in this paper, and the literature review and findings will be of value to researchers interested in final year/undergrad projects, and teachers wishing to develop such modules. For example, this will be useful where there is a need to develop assessment criteria with proper instructions laid out that address creative thinking. Hence creativity, motivation and knowledge will also contribute to the various students' learning experience.

5.0 CONCLUSION

This study has provided the ground to nurture the creative skills of students with research problem formulation. This was achieved with the creation of the online eGuide as an intervention that provided access to relevant and related materials to help final year students to understand their supervisors' and assessors' expectations of the final year project. By giving students access to previous project proposals of their peers an avenue was provided for new students to venture and expand their abilities and be creative with their ideas. This approach is readily adaptable by others to their context, including the method of user-supported design and testing.

In order to produce students who are capable 21st century graduates, there is a need to develop their research and inquiry skills (Brew, 2003). This was achieved by reshaping the final year project to emphasise research-based study in an undergraduate programme, something which has become the centre of attention in many countries to foster innovation and creativity in society (Healey et al., 2013). With a focus on independent learning, this allowed students to be more involved in all aspects of their project, from the choice of subject matter, the kind of approach taken, through to the kind of target they wished to achieve. This can sometimes lead to a successful transition to the next stage of their career, either to the workplace or further study. In order to support this kind of approach "a flexible but equally robust approach is required in the design and assessment of FYP to meet the needs of students from diverse subject areas and types of institution" (Healey et al., 2013, p. 14).

A clearer account of what is expected within the FYP together with sample projects, were made available as these are necessary to enable students to handle such tasks (Todd et al., 2004). Therefore a balance between freedom and structure within the FYP was achieved to enable student to flourish while providing necessary contact, support and training (Hughes, 2002). As this is now a common objective of undergraduate degrees, other teachers may find our approach helpful in their curriculum design, as may educational researchers interested in examples of theory underpinning my practice.

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