This is the published version (version of record) of:


Available from Deakin Research Online:

http://hdl.handle.net/10536/DRO/DU:30033722

©2010 IEEE. Personal use of this material is permitted. However, permission to reprint/republish this material for advertising or promotional purposes or for creating new collective works for resale or redistribution to servers or lists, or to reuse any copyrighted component of this work in other works must be obtained from the IEEE.

Copyright : 2010, IEEE
Emergence of Creativity in Learning via Social Technologies

Sophie Nichol
Deakin University
School of Information Technology
snichol@deakin.edu.au

Abstract

Creativity is an elusive skill desired by many. Debates on ‘What is Creativity’ and how it can best be nurtured and supported had resurgence in the 1950’s after Guilford’s address to the American Psychology Association about the positive benefits of creativity. Since then creativity has been investigated in many forms and within many disciplines. Of note is that creativity is apparent within four components: the person, the process, the product and the environment. On some level creativity is assessed within one of the four components of creativity: person, process, product or environment. In this study creativity and the environment is under investigation, with a number of factors presented that allow creativity to be supported. This paper explores the role of creativity within the education of tertiary students studying Games Design and Development (within an IT discipline) from an Australian University. Particularly this paper focuses on how social factors, such as purpose built collaborative environments and virtual communities, aid in the creative pursuits of the students.

Keywords: Creativity, Video Games, Education

1. Introduction

Creativity is no longer a skill of the artiste’ but is becoming a requisite skill in many disciplines, including Information Technology. Creativity of Historical, Eminent, Cultural and Specific definition was once associated with humanity’s elite intellectual and artistic personages [3], and was acknowledged as a quality only exhibited by a few gifted people. However this romantic/idealistic view, that creativity is only bestowed on a privileged few, is no longer predominant. Creativity is a requisite skill within the study of Games Design and Development and thus the need to facilitate creativity for the students, particularly by social means, is the focus of this paper. A compliment to the facilitation of creativity was that predominately students in Games Design and Development studies are those largely from the label of ‘Generation Y’. Generation Y are the first digital natives whose interaction with contemporary communication technologies is the way of life, not merely an innovative addition. Generation Y’s preferred/recreational behaviours revolve around the consumption of the digital world often in social ways [13]. Complimenting creativity via social attributes is somewhat of a natural mechanism for Generation Y students, particularly those studying Games Design and Development. Importantly, the Generation Y label onto students somewhat necessitates a prescribed mode of learning, which exhibits elements of constructivist and social learning.

This paper will explore what is creativity within the study and Game Design and Development, and propose that social elements, particularly purpose built collaborative environments and virtual communities, are the best mode to facilitate and support creativity within Generation Y Students.

2. Creativity

Creativity research has always tried to address the question: What is creativity? From the literature, it is clear that one definitive explanation of creativity cannot be given. Whilst definitions of creativity abound, such explanations are inevitably imbued with a domain-specific focus. Furthermore some research reveals a skepticism regarding the occurrence of creativity, if not on an eminent level such as that of Einstein or Freud. Rather than perceiving creativity as the sole domain of the ‘artiste’, this study defines creativity as the exploration and resolution of problems of rather less heroic proportions that enable us to negotiate our way through daily life more effectively [19], [8].

Creativity occurs in four components: person, process, product and environment [1], [3], [5], [9], [10], [14], [23]. These four elements are given prominence in this study, particularly environment. The creative environment suffers from a lack of literature in comparison to the other components of creativity, particularly the creative process. Creativity, by its very nature, is difficult to articulate yet, according to Smith et al. [26] simple to recognise when it occurs in each of the components of person, process, product and environment. However, the problem is in assessment of the components of creativity in unison. This
study does not attempt to address the problem of creativity by looking at all four components. This study makes a specific look at the largely misunderstood component of environment. In addition to the focus on the creative environment, this study also looks at the type of creativity termed ‘everyday’. Rather than creativity being defined as sporadic “aha” moments in a person life, creativity can be seen as a phenomenon that has been shown to exist in a wide variety of activities and settings across a person’s entire life span, i.e. everyday creativity [8].

Creativity is manifest in all disciplines such as psychology, art, science and technology. Since the 1950’s creativity has been extensively investigated and has been found everywhere, and is not only the domain of a privileged few. Creativity is, as Urban and Jellen suggest, “essentially human and potentially relevant for nearly all fields of human activity” [31]. Creativity is therefore relevant and apparent within the discipline of Games Design and Development.

2.1. Creativity in Games Design and Development

Creativity within the discipline of Games Design and Development is a requirement to allow games designers and developers to be able to create worthwhile, meaningful and fun game play experience [3]. Creativity is manifest throughout the process of game creation, from concept development through to final code production, and is a requisite skill of all involved, from programmers to management. This skill of creativity is similar to as described by [31] Urban and Jellen in their components model of creativity (Figure 1).

The model highlights 6 components required to facilitate a creative process: divergent thinking, general knowledge base, specific knowledge base and specific skills, focus/ task commitment, motivation, openness/ tolerance for ambiguity. Of significance however, is how the model represents where these components are facilitated. The model shows that each component can be supported individual, collaboratively or on a more global dimension.

The model allows for creative skills to be expressed while allowing creativity to influence on many levels. This perspective that creativity is manifest in the individual, with influence from peer groups, the local community, as well as influence from a larger global community is the definition of creativity that is apparent within the students who study Games Design and Development. In addition to defining the characteristics of creativity, the students who study games were also defined largely as those from Generation Y.

3. Generation Y

‘Generation Y’ or the ‘Net Generation’ [21] those born in the 1980s or currently aged between 12 and 25 (approximately).

“Net Gen students are social and team oriented, comfortable with multitasking, and generally positive in their outlook, and have a hands-on, “let’s build it” approach - all encouraged by the IT resources at their disposal” [21]

Labels such as Generation Y are used to describe the overriding characteristics that people of this age exhibit, which is a desire to be constantly connected to one another, either by mobile phone or internet technologies [12]. In addition, as Beavis [2] highlights, Generation Y have a ‘digital culture’ and this is in fact one of the significant ways they connect with knowledge, through social and collaborative technologies. Other generic traits that could be attributed to the Generation Y include: networked peer-to-peer communication, flexibility, spontaneity, experiential, engagement and experience, immediacies, sociality, collective team players, structure, and visual and kinesthetic representations of information [13] [22]. Knowledge within the Net Generation is considered interdisciplinary and team generated, which all evolves from application of problems within a real world context [16]. In addition, the generation is considered to be a product of the contemporary environment. As Oblinger [22] suggest, our experiences and the environment around us shape how we think, behave, and act. For the Net Generation, technology such as the Internet was an increasing part of their environment as they grew up. These traits effect all aspects of a Net Generation student’s life, particularly their learning style.
Universities need to accommodate Generation Y’s learning style and consequently, as Dawson et al. [7] argues, universities are attempting to provide a competitive, quality educative experience to an increasingly culturally, educationally and economically diverse student cohort.

4. Learning Styles

Creativity is a characteristic of learning [10]. As introduced previously Generation Y students have a particular learning style often dictated by social mechanisms and the contemporary environment [28]. Similar to creativity, the learning style of Generation Y requires avenues for social interaction to occur, and a culture of learning and knowledge to be built through mechanism of language, dialog and community. Building community is essential to support social and cultural aspects, and should be ingrained in a physical and virtual sense, to best support the learning style and concurrent creativity of Generation Y [27]. Constructivism is a perspective which aids to support the learning style of Generation Y, particularly those studying Games Design and Development. Constructivism is the building of an individual’s learning experience through a social domain [28] [30] [32]. The main imperative is to make the learning experience personally meaningful, with the practical application of tasks also of importance [29]. Vygotsky’s [32] ‘Zone of Proximal Development’ is a notion supported by the constructivism philosophy, which argues that students interacting together will help each other determine the gap between ‘what they know’ and ‘what they need to know’. The gap is determined by the provision of dialogue and a language within a social/collaborative setting. Constructivism is conducive to the support of learning and creativity for Generation Y students, and within the study of Games Design and Development is an appropriate philosophy to support students in their academic endeavors’. Within this study elements of the constructivism learning style are apparent, with the focus on social engagement and community of significance. To highlight the components of the learning environment which helped to facilitate the learning style of the students who study games, the process of research inquiry will be discussed next.

5. Research Inquiry

The process of research inquiry within this study was focused on the students who study Games Design and Development as a part of an Information Technology Degree at Deakin University in Victoria, Australia. The learning environment that the games students worked within was of specific focus. The research inquiry focused around a process of action research.

5.1. Action Research

Action research aims to solve urgent problems and improve practice within an organisation or community of members [14] [19]. Action research emphasises the idea of knowledge generation as creative practice evolving through dialogue [24]. This process of dialogue in action research requires participation and interaction by the both the researcher and participants within the environment under investigation. Action research “seeks to bring together action and reflection, theory and practice, in participation with others” [24]. Of significance in action research studies is the imperative for change through a cycle process, which involves influence from both researcher and participants. Action research was used in this study to seek out how to best support the creativity of the students who study games, and this was done via a collaborative, cyclic process of dialogue between researcher and participant.

5.1.1 Action Research Cycles

As mentioned, action research is a cyclic form of research inquiry that leads the researchers on a process of problem definition. The initial problem in a situation (in this case the games students learning environment) was uncovered, and from a cyclic process of investigation and participation from the researcher the problem is addressed. The problem to be addressed may go through many cycles. In this study, two main cycles were identified to have occurred. In summary the cyclic process undertaken by the action researchers included:

Cycle 1:
1. Observations, discussions and interaction (online and face-to-face) were undertaken with the games students and staff.
2. Observations, discussions and interaction continue, with investigation of other learning environment conducted. Problem situation redefined.
3. Interview conducted with the games students and staff.
4. Based on three previous steps, a survey of the creative environment was deployed.
5. A interview with industry professionals was conducted to determine what creativity means in industry.
6. Based on results, the action researchers instigates changes within the problem situation. Problem situation re-defined
7. Test for Creative Thinking – Drawing Production Undertaken
Cycle 2:
1. Observations, discussions and interaction (online and face-to-face) continue with the games students and staff.
2. Interview conducted with the games students and staff.
3. Based on three previous steps, the sense of community survey was deployed.
4. Based on results, the action researcher instigates changes within the problem situation. Problem situation re-defined
5. Test for Creative Thinking – Drawing Production Undertaken

The environment that facilitates the action research process are discussed next. The participants of this study are the students who study Games Design and Development, and of focus are the learning environments of: purpose built collaborative environment and the virtual community, that all exist within a traditional university setting.

5.1.2 Purpose Built Collaborative Environment

The games lounge was a purpose built collaborative environment comprised a physical, face-to-face, learning space in which students were encouraged to play co-operatively and participate in collaborative and peer learning. Play still resulted in physical learning and collaboration among the students. The importance of play and humour is essential in creativity [1] [9] [15] [17], which this environment both encouraged and supported.

![Figure 2. Purpose Build Collaborative Environment: ‘The Games Lounge’](image)

Physically the environment comprised a number of desktop computers as well as a game console playing area. Note boards, desk and whiteboards were also available to give students a place for work as well as play. The games students had access to the room at any time of the day. Teaching staff rarely visited the Games Lounge, which made it easier for the students to use. In addition to the purpose built environment of the games lounge, a virtual community was also an element of the games students learning environment.

5.1.3 Virtual Communities

The virtual community which is a learning environment of those who study Games Design and Development is managed by teaching staff of # University. Technologically, the virtual community was housed within the University's online learning tool, which is used for the delivery and management of content for units of study. The virtual community was a tool accessible to students via the Internet from any location, even outside the University. In addition, the community focus on the virtual tool is largely managed and facilitated by students. In addition to the Games Lounge and the virtual community as components of the learning environment, the more traditional learning approaches of lectures and practical classes are also of significance with the study of Games Design and Development.

5.1.4 Traditional University Setting

The lectures and practical classes are a structured and important component in the facilitation of learning within the students, and thus their inclusion as a characteristic that impacts upon the creativity of the students who study Games Design and Development. Through the combination of learning environments of the: Purpose built collaboration environment, virtual community and traditional University setting creativity is supported.

5.2. Research Problem

Through a combination of learning environment, participants, research and the cyclic inquiry method of Action Research a problem situation was formed over time. The final iteration of the problem situation is:

In the current learning environment of the games student’s creativity was stifled by environmental factors such as a lack of resources and areas for exploration. Predominantly, creativity was restrained by the games students themselves because of their perceptions about the nature of creativity. The nature of the games students, to subsume their own creativity, is problematic as they were required on a daily basis to use creativity in their assessments tasks for the Games Design and Development degree. In addition, the specific design and management of creativity is problematic as it did not provide the right setting for the games students to engage in creativity and be nurtured by peers and mentors.

Based on this problem situation, the main research question to be addressed was:
How can the current environment for games students at Deakin University be enhanced (in both technological and social ways) to facilitate a more reflective and practical philosophy that, in turn, encourages the creative skills of the games students?

6. Results

To determine creativity and what supports it for the students who study games design and development, a number of techniques of measurement were applied in this study. Nested within the action research perspective the techniques included: A test for creative thinking – drawing production, a survey of the creative environment factors, and a survey of sense of community. In addition, observations and interviews with the participants of the study were also conducted, within a cyclic process of action research.

6.1. Test for Creative Thinking – Drawing Production

As a means to measure the creative potential of the students who study games, the 'Test for Creative Thinking – Drawing Production (TCT-DP)' [30] was employed. The TCT-DP is a psychological assessment of creativity, which is undertaken via administration of a series of drawing tasks. The test was administered to 27 undergraduate students who study games design and development. The results of the TCT-DP were achieved by the researchers grading each test, based on various scales of performance, as set out in the TCT-DP administration instruction manual [31]. Figure 3 shows the results of the TCT-DP.

Figure 3 shows that 63% of students received an ‘on average’ result for their level of creative potential. 27% of students received an ‘above average’ results on their level of creative potential. 10% of students fell below average on their creative potential. Creativity is therefore present and normally distributed amongst the games students’ population. What helps the students to continue to facilitate this creative potential was questioned via a survey which discussed next.

6.2. Factors that build a Creative Environment

As introduced in this study, creativity is influenced through 4 components: person, process, product and environment. In this study, the creative environment is of focus, to ascertain how it influences a person’s creativity. Complemented by Urban and Jellen’s components model of creativity [31] and based on a review of the literature [9] [15] [18] the following factors (categorised into four groups) have been found to be influential to the creative environment.

1. Resources: idea time, idea support, challenge and involvement, sufficient resources including: materials and facilities, people and information [9] [15] [18].
2. Personal Motivation: trust and openness, tolerance for uncertainty and ambiguity, playfulness and humour, leadership (includes status quo and political issues), energy, absence of interpersonal conflicts, focus, direction and goals [9] [15] [18].
4. Social: supervisory arrangements, diversity, experience and skills, work group supports, team work (collaboration), community [9] [15] [18].

The elements that make up a creative environment are many and varied. To gauge what was an important factor to be included in the creative environment of the games students, a survey was undertaken. The survey asked students a question about each factor of the creative environment, with their response provided through means of a likert scale (strongly agree, somewhat agree, neutral, somewhat disagree, strongly disagree). Over 30 students completed the survey about the creative environment. Figure 4 shows the percentage of strongly agree for each factor questioned within the survey.
Figure 4. Creative Environment Survey Factors: Strongly Agree

The highest rating factors include: Sufficient resources (materials and facilities) and (people and information, playfulness and humour, freedom, workgroup supports, idea support and trust. In addition, the need to minimize conflict was also apparent. All the factors that make up a creative environment are of importance, yet some factors needs to be more supported for the students who study games more than others. All factors are interdependent with each other, and cannot be presented in isolation without influence from the other factors.

Of these highly rated factors, sufficient resources (people and information) and workgroup supports, which are social components where strongly agreed with.

As a part of the action research process, the researchers were immersed with the students in their creative environment. It was apparent that factors such as trust are highly interdependent with social elements such as work group supports. This is highlighted by reflective comments such as:

“It’s good to see that I’m not the only one who loves games. There’s a lot of good web links and insights that fellow gamers can give”.

This example shows work group supports and trust. As Piirto [23] states “in team efforts, groups must have a modicum of trust”. Workgroup supports and trust begin to assert the notion of community. A community is concerned with support, nurturing and the establishment of relationships within social networks. At the time of delivery of the creative environment survey, community not explicitly included as a survey question. From interviews and observation of the students as a part of action research, it became clear that community was an important factor that needs to be supported for the students to build creativity. In addition, as expressed by Piirto [23] trust is an integral component to the development of community. For example, students expressed in the interviews their needs for community:

“I believe communicating with fellow students is a very important aspect of studying, the forum is awesome”.

“A community is being able to share opinions with other students, especially students at other campuses.”

The need for work group supports (peers) to build creativity and community was apparent in comments such as this. In addition comments in the creative environment survey, helped to re-iterate the needs for peers, not only to build creativity but to help build a strong community. As one student commented:

“It would be really good if we had a more diversified lot of students to study with”

Diversity is a factor that contributes to creativity, and a group of peers with different knowledge and backgrounds adds to creating a thriving diversified community [#]. The student comments show the desire for multiple skills bases and different dialogue to be apparent with the learning environment.

In addition to diversity within the work group support, it was found that supervisory arrangement also influenced the social constructions within the learning environment. As Piirto [23] argues, supervisors who encourage creativity, have more success. From immersion within the environment as a part of the action research process the factor of supervisory arrangements aided significantly in developing work group supports and providing people and information showing the interdepedant nature of the factors.

From the results of the creative environment survey, immersion within the learning environment of the students, and based on literature on the learning systems of the students who study games, social elements especially community are of significance in their influence on the creativity of the students. Therefore, more investigation into community within the study of Games at Deakin University was undertaken.

6.3. Sense of Community

To ascertain more information about the ‘community’ of the students who study games the ‘sense of community’ index was employed. The sense of community index is a psychological assessment that breaks community down into two dimensions: learning and connectedness. Within these two dimensions the components include: membership, influence, fulfillment of needs, and emotional connection. In the sense of community index used in this study, 20 questions were posed and students responded on a 5 point likert scale. In this study the sense of community index was not used in the manner intended by Chavis et al. [6] that is, to draw quantitative cross sections of the games students’ sense of community but rather, it was used in as an addition to the qualitative
results collected in the study, such as observations and interviews in the course of the action research. 25 students who study games answered the sense of community survey. Table 1 indicates the individual and total scores for the sense of community index undertaken with the games students. The score was calculated based on instructions provided by Rovai [23].

Table 1. Sense of Community Scores

<table>
<thead>
<tr>
<th></th>
<th>Community</th>
<th>Connectedness</th>
<th>Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>N of Cases</td>
<td>25</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>Minimum</td>
<td>48,000</td>
<td>18,000</td>
<td>25,000</td>
</tr>
<tr>
<td>Maximum</td>
<td>82,000</td>
<td>45,000</td>
<td>39,000</td>
</tr>
<tr>
<td>Median</td>
<td>68,000</td>
<td>35,000</td>
<td>32,000</td>
</tr>
<tr>
<td>Arithmetic Mean</td>
<td>66,565</td>
<td>33,870</td>
<td>32,696</td>
</tr>
<tr>
<td>Stnd Err</td>
<td>1.916</td>
<td>1.375</td>
<td>0.842</td>
</tr>
<tr>
<td>Arithmetic Mean</td>
<td>1.916</td>
<td>1.375</td>
<td>0.842</td>
</tr>
<tr>
<td>Stnd Dev</td>
<td>9.189</td>
<td>6.594</td>
<td>4.039</td>
</tr>
</tbody>
</table>

Following the procedures and scoring system outlined in Rovai [23] the total score for any community was calculated with the results of 82 being the maximum community score that could be achieved. Table 1 highlights that the sense of community index for the games students yielded a community score of 68, which suggests according to Rovai [26], that a sense of community was moderately supported within the situation.

7. Discussion

The results presented in this study are drawn from the students who study games, from their immersion with the researcher within the learning environments as presented in section 5. From immersion within the social mechanisms of a purpose built collaborative environment and the virtual communities, students expressed their needs to support their creativity. Based on the results presented in section 6.1, the creative potential of the students who study games is apparent with 63% of students of average creative potential. In addition, based on the results of the creative environment survey (section 6.2) and sense of community survey (section 6.3), it is apparent that the use of social mechanisms is best to support generation Y learners in their creative endeavours. However, these results where gathered as a part of an action research process, therefore in addition to more traditional results such as surveys and quantitative statistics, qualitative dialogue and ‘moments of action’ in response to surveys and tests about creativity and the learning environments are also important to express. Some examples presented next are ‘in context’ examples of creativity as they come from the virtual community of the students who study games.

As introduced in section 6.2 the factors that build creativity in an environment are highly interdependent, and their inclusion is required for mutual support of other factors. In the creative environment survey, students moderately agreed that trust was important to facilitate creativity, however from further investigation it can be seen that trust is integral to facilitate other factors of the creative environment, particularly social factors. As Mathiesen and Einasen [18] state “the environment should ensure the creative people feel safe. When an environment makes the creative person feel safe the creative ideas are more eagerly expressed. Ideas should not be ridiculed or seen as an indication of failure”. Rovai [26] further emphasises, “with safety and trust comes the willingness of community members to speak openly”. These notions of safety and trust within a environment, particularly one that exhibits community aspects such as in this study, are not easy to implement. Members need to be made a part of the community for them to feel safety and have trust. In addition, for members to be creativity and show risk, they must establish trust [23]. The community of the students who study games, was established via a learning environment, thus a similar purpose and direction, which is to be a part of a learning community about games, was apparent within the students. This similar purpose is a contributor towards building trust and community. Students expressed this similar purpose within their virtual community, as expressed by one student comment:

“I like the overall approach of each student’s involvement. For years I thought that computing was so separate from gaming, but after the introduction of the gaming units I found my interest and also realised that I was not alone”.

This expression of interest shows the student expressing a common purpose, a community bond, between the students who study games. It was comments such as this, and other dialogue within the virtual community, that showed the need for a common purpose and trust to be developed, before social interaction could flourish. Leveraging off the common purpose developed within the community, students where asked what other type of discussion/area they would like to have available in the virtual community, one student commented:

“I’m into quite abstract, unique games, so obviously that is the type of thing I want to talk and learn about”.

This student freely expressed their common purpose and interest for an avenue of games design and development. In addition to comments such as this, students showed support for the virtual community, which also highlights their motivations of use:

“I regularly check the online community for info and discussion of games. In other units, I normally go
The virtual community in the games units has been established beyond its mere support for learning, it is seen as having elements of community.

The virtual community offers more than just a functional support for learning related content, but also offers an avenue for discussion and communication, as expressed by the student comment. However, not all students feel easily or immediately comfortable with collaboration via a virtual community. As one students expressed:

“I have not submitted to any discussions on the virtual community because I am shy. I have found discussions on student talk very helpful / interesting throughout my studies.”

This student shows that use of a virtual community does not necessarily mean contribution. Participation can mean use and assimilation of ideas from a more silent perspective. However, it is acknowledged that this is not productive to allow a virtual community to have many silent members, as it may become stagnant. It is important that all members participate in some form, so that the community is thriving. The sense of community index showed that community is moderately supported in the learning environment, thus asserting that community is supported by ways such as participation.

As mentioned above, participation is important to allow a community to exist, and the participation within the learning environment particularly the virtual community, of the students who study games was high (refer to [17] [18]). From further investigation, it was found that this high participation was largely due to the supervisory arrangements within the learning environment. For example the following shows a commentator from the virtual community of a playful way for the supervisory arrangements to be managed. A student starts a post in the discussion forum entitled ‘Myst is the worst game ever’:

“The start of Myst I nearly fell asleep, then I had no idea what I was suppose to do, then that guy spoke for ages so I used the 3 magic buttons (ctrl + alt + del) and I was saved” (student comment).

“Whilst - agreeably, it is a very difficult game to play, I think the main reason we've been instructed to endure it's meek linear timeline and degrading graphics is something to do with the definition of gameplay”. (student comment).

“I may not get to the lecture at this rate .... your cruel comments have destroyed my confidence... :( You may have to come looking for me ... I'll be in the library ... still trying to find my way out (what was that you said .... ctrl + alt + del ?????)” (lecturer comment)

In this commentary the students interact with the lecturer in the virtual community in a very playful manner. The playful nature of interaction within the learning environment of the students, is also a factor that has a positive and interdependent influence on the other creative factors, particularly trust and idea support and status quo. This playful manner helps to build friendly environment, and does help to encourage participation. It was observed that the students thrived in an environment of open dialogue between student and teacher. In the above comment the students bring in reference to the face to face interactions that have occurred with the lecturer, which asserts the needs for a combination of ‘tools’ to help build a learning environment. The combination of tools in this study include: purpose built collaborative environment, virtual community and more traditional mechanisms of lectures (section 5).

7. Conclusion

There are many difficulties with assessment of creativity largely due to the fact that in each individual it is an unknown phenomenon. However, based on the number of data collection methods employed, it is certain to say that the environment, specifically social aspects, has influence on the creativity of the students who study games.

8. Future Work

This research hopes to extend into a larger comparative project with another University to compare creativity and the best mechanisms to support it. In addition, creativity will be trialed at Deakin University as a more formal educational practice, with training provided across the school, not just within the study of Games Design and Development. The development of a creative culture that is apparent with the University and the wider community also needs to be facilitated, and it is hoped via dissemination of the student’s creative product, that the wider community can be involved in the creative process of the students who study IT and Deakin University.

9. References


[23] Piirto, J, Understanding Creativity, Great Potential Press, 2004


