Exploring Creative Pedagogies for Creative Learning Ecologies

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Introduction to CAM7C June 2017

This issue of CAM7C has an Irish flavour to it. By that I mean, thanks to a coincidence of factors, the content of this magazine has been entirely derived from teachers and experiences in Ireland.

The main feature is a fascinating description and evaluation of educational practice that has been developed in the Civil Engineering Department at the University of Limerick. One of the members of Creative Academic’s team, Professor John Cowan, who is also a Civil Engineer, has been working with members of the department on a module called Design Studio. John suggested that the approach being used by the module teaching team to engage students in creative problem solving, would make an interesting article for the magazine and we are delighted that the teaching team - Tom Cosgrove, Michael Quilligan and Declan Phillips kindly agreed to write it.

It so happened that in June I was also in the west of Ireland contributing to professional development events at three different institutions including the University of Limerick. During my visit I managed to meet Tom and Michael for a delightful lunch. Furthermore, Declan was one of the participants in the CPD module I was helping to facilitate and during a quiet moment I was able to interview him to try to find out how his pedagogical beliefs and knowledge had helped shape the undergraduate curriculum in Civil Engineering.

So that is the story of how this particular issue of the magazine came about and we are indebted to the authors for the generous and creative way they have shared their practices and insights. So we would like to dedicate this issue to all the creative higher education teachers in Ireland who I met on my visit who are committed to enabling their students to use and develop their creativity in the challenges they create for them.

Norman Jackson
Commissioning Editor
Commissioning Editor: One of the goals of Creative Academic is to understand not just the what? and the how? of educational ideas and practices but also the why? But why particular educational practices came into being in the way they have is often very difficult to ascertain. As our year long creative pedagogies project has progressed perhaps the most significant learning we have gained is the insight that in order to really understand complex educational practices we also need to understand the teacher(s) who create such practices. It’s not surprising that teachers, with unique histories of experiences through which they develop their beliefs, values and knowledges, create highly personal and unique pedagogical practices. Teachers create rich ecologies in which students’ learning and creativity can flourish because of who they are and who they are trying to become. This reflects their accumulated past experiences and situations and events that have shaped their lives, and their interactions and relationships with people, ideas and problems in their real and imagined worlds.

The following article offers a way of engaging with the minds of teachers as they perceive, reason and imagine the sorts of education they want to provide and the steps they have taken on their pedagogical journey. Tom, Declan and Michael create a wonderfully rich professional conversation that we can all learn from, full of insights and a creative artefact in its own right.

Encouraging and Facilitating Students’ Creativity in Problem Solving in Civil Engineering at the University of Limerick

Michael Quilligan, Declan Phillips and Tom Cosgrove

Michael is a civil engineer, lecturer and Course Director for the Civil Engineering programme at the University of Limerick. Following post graduate degrees in structural engineering in Ireland and Sweden, Michael worked as an engineer in London and Limerick on a wide variety of projects before joining the Civil Engineering programme team in 2008.

Declan is a civil engineer and senior lecturer at the University of Limerick. He holds PhD and MSc degrees from Trinity College Dublin and teaches courses in soil mechanics, forensic engineering & ethics and is the module leader for the Design Studio module discussed in this paper. As the inaugural Course Director for the civil engineering programme, he was instrumental in establishing the programme’s student centred pedagogy.

Tom Cosgrove is founding professor of the problem-based programme in Civil Engineering at the University of Limerick. He practised as a structural engineer for 28 years. He is a Fellow of Engineers Ireland and of the Institution of Structural Engineers. As well as his research in structural engineering, he is currently pursuing action research on reflective writing in engineering education.

Preamble

This article describes one of the educational experiences in the University of Limerick’s (Ireland) undergraduate civil engineering programme. The module discussed is “Design Studio” which runs in the first semester of year 2 and focuses on creating the opportunity to enrich the formation of the next generation of civil engineers. At its core is the cultivation of listening skills so the young engineer is better equipped to respond to a client’s brief in a creative and innovative way. The module sits within a programme that adopts a Problem Based Learning (PBL) pedagogy in which the problem solving ‘process’ has parity of esteem with the required ‘technical’ content. In adopting a conversational structure throughout the paper, the facilitators are acknowledging the individualistic and personal drivers of creativity. These include an openness to diverse and different views as essential and necessary components of a creative process. The article starts by presenting the context and culture for the module through the reflective lenses of the engineers that facilitate the module’s implementation. Student reflections are interspersed throughout the dialogue as evidence of the challenges or dissonance they face when invited in to what for them are unchartered educational experiences.
TC: “Declan, I think it is fair to say that the main thing you and Michael were concerned about in the current iteration of the Design Studio module is connected to freedom and creativity. But before we get into that I think the context is important because modules like Design Studio don’t happen in a vacuum, especially not in engineering education. So maybe you can talk a little bit about your role in getting academic approval for our Civil Engineering programme. What stands out as important in your memory?”

DP: “Firstly, it was clear to me at the launch in 2008 that I could not in conscience propose something that replicated my own formation. So from the beginning it differed from its contemporaries in one substantial aspect - its pedagogy. In shepherding the programme through the various approval procedures in 2007 and 2008, I was concerned that at all times it was designated as a problem based programme.”

TC: “Yes, and then the team was recruited with that problem based commitment up front and centre, starting with myself”.

DP: “Yes. I suppose you could say that the programme team were recruited to develop a programme that already had certain values and understandings implicit in it because it was to be a problem based programme. That led to the recruitment of a team who understood engineering as creative problem solving. That naturally opened the door to many applicants with significant engineering practice experience including yourself and Michael, although this could not have happened without institutional support or at least acquiescence at many levels. So there was openness to the project within UL, even if not everyone who acquiesced fully understood what we were aiming at!”

TC: “What do you think led you to insist on a problem based approach?”

DP: “Firstly I recall when I started practising in the USA in the 1990’s the sheer excitement of being a Civil Engineer. Then I wondered: “Why, in all the years I spent in formal education, was this excitement and deep satisfaction never communicated?” Secondly, I was reflecting on my experiences as a practising engineer. In my university undergraduate education I had never encountered anything like the complex problems of practice. I was never drawn into solving problems that stimulated me to research, think and be in conversations with colleagues. It was as if my education belonged to a different world. There was certainly technical rigour but the thrilling life of engineering was missing.”

TC: “I think there are some echoes in my experience. My design ability was only unlocked when I crossed a threshold of confidence. One vivid threshold moment springs to mind when I realised quite suddenly one day during my first year in practice, that I had actually produced an original design solution. The Architect wanted to hang a very heavy marble-clad planter off a light slab. I realised I could invert the idea; reverse the load path: the planter wall could become the primary structure supporting the slab. I could say today that this was a moment of reflective self-awareness. The “Can I do it?” self-doubt that saps energy and kills imagination faded away. Analysis was useful, even enjoyable, but design ideas seemed to spring from somewhere beyond logic and analysis. As confidence grew, there was a tremendous sense of liberation, of imaginative freedom, and in fact it was this creative playfulness that drew Architects back to work with me: creativity sells! At the same time, I knew that fluency was acquired partly through the long labour of analysing many examples.”
MQ: “I think that when the team began to design the programme we were more concerned with the actual process of enquiry and design than with the details of a specific calculation. The problem came first, then came imagined solutions: the rigorous checking was essential but that came last. Many of us felt that our formal education had placed more emphasis on the ‘closed form’ (one correct answer) type of analytical puzzles rather than on the process’ of solving open-ended engineering problems. There was also a strong realisation that this problem solving must happen very early in the programme.”

TC: “Yes, I think we were trying to orient our students towards real messy problems from the very start, with analysis in a supporting role. And I think we were all aware that computers and the internet were changing the game, shifting the role of the engineer from analysis to invention and synthesis.”

**We need creative problem solvers**

DP: “The really valuable skills and attributes were not going to be code-based computational procedures. Both you and I had to teach ourselves many codes after graduation. Our education did give us the fundamentals to allow us to do that. It had considerable integrity in that respect. But the long-term need was going to be increasingly for creative thinkers who understood technical fundamentals but who could work creatively in teams often with non-technical people”

TC: “Yes, creative thinkers who were technically literate, who understood the fundamental physics of the situation. In my experience concepts like equilibrium can be presented in University as really elementary, first year stuff but I believe they can be thoroughly grasped only through solving many problems. Then the concepts become part of an easily accessible repertoire, like a melody that is at a musician’s fingertips, available on demand. I think fundamental ideas like equilibrium, stability and especially load path, ideas that integrate and unify are the most valuable. Academic specialisation tends to fragment, lose the bigger picture that should dominate design. Undergraduate students need to be formed in a process that gets them asking the right questions as a matter of habit. As educators, we are, or should be, involved in forming good habits, professionally speaking. I could suggest that good professional habits can’t really be separated from good personal habits but talk of character might be considered old fashioned!”

MQ: “I agree that all design involves creativity, but we need to check in with ourselves and ask: to what extent are we being creative ourselves and enabling creativity in our students? “Do unto others...”. I do think we have faced a dilemma that we have not fully solved yet in our programme design. Even though our core programme is problem based, I don’t think any of us doubted that an engineer must still grasp the fundamentals of, say, mechanics or structural analysis. Therefore the journey we have mapped out in many of our projects is constrained, because we are leading them along a route where they must encounter rigorous knowledge and content. There isn’t enough scope to deviate. Design Studio is an attempt to break away from that: as little structure as possible other than a deadline, briefing sessions to orient, liberate the mind so that creativity has free play, so the students can truly realise there is no right answer, no wrong answer.”

**"computers and the internet [are] changing the game, shifting the role of the engineer from analysis to invention and synthesis."**

"to what extent are we being creative ourselves and enabling creativity in our students?"

TC: “You are right. We always wanted to reach past the physics and pragmatics of a design problem, to stretch students into a more creative zone and we have struggled to do that. Still, notwithstanding the constraints that we felt we had to honour, we have managed to set problems that draw students through the whole design process in every year of the programme. In fact, Michael, your own “first year, first week, first day” project is the archetypal example. Your project gets students thinking, researching, imagining, designing, critiquing, calculating, procuring, making, testing and presenting, all in one week even before they have had a single lecture! And there is so much creativity demonstrated in that project. So we can be too hard on ourselves!

DP: “Tom, I think it was, back in 2011 when we were assembling material for our first web-site video that you told in the video the story of how students exercise the whole design process in every year but on increasingly complex projects. We were overturning the traditional sequential educational model built on incrementally acquired knowledge of science, then engineering science, then engineering procedures and then, in final year, eventually an overarching design project: a “you will understand one day why you are studying all this theory” so to speak theory of engineering education.

TC: “Yes, but I think we had actually done that overturning before we saw clearly what it was we were doing! It was when we stood back and considered what we had actually created that we were able to understand it explicitly. We were inculcating habits, a process of enquiry and creation, derived from the world of engineering practice”.

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DP: “And I agree that Michael’s “first year, first week, first day” project is, if you like, the proof of that pudding: the full design process exercised using prior knowledge from secondary school and on-the-spot research to complete a design, build it and test it. The traditional model is sequential and hierarchical. You can’t eat the full design pie until final year! Whereas our approach develops knowledge and process in unison: you can have your cake and eat it! The increasing diameter of the circles indicates that the students work through a full cycle of the design process in every project, but the problems increase in complexity as the students’ progress.”

![Figure 1 Traditional and emerging educational paradigms](image)

DP: “Getting back to creativity: creativity is involved in solving even simple problems in any discipline; I see creativity as an attribute that young children have in abundance but unfortunately they seem to lose it progressively as they move through formal education. One student reflected after Design Studio: “I feel that my ability to be creative was hampered slightly by the school system” and another writes “I think that secondary school can drive creativity out of people by teaching that there is a single correct way to do something”. For me, the current iteration of our “Design Studio” module in second year is an attempt to bring creativity front and centre by highlighting its central role in responding to a design challenge. This was partly to escape from the constraints that Michael refers to above even if we have partly put those constraints on ourselves!”

MQ: “Yes, Declan, I agree that after all the iterations since 2008, the Design Studio module is now very much focused on creativity. I remember one incident that occurred back in 2012 which was a significant ‘nudge’ towards its current form. The Ilen School was an educational initiative that uses boatbuilding as the vehicle for personal development. A director of Ilen had approached one of us to see if the Civil Engineering programme could get involved in their project to rebuild ‘the last of Ireland’s timber built ocean going sailing ships’. There were obvious parallels between our approaches: a merging of craft (Figure 2) and engineering in a raw and open learning environment. I think we shelved the idea at the time mostly due to the constraints we were operating under in trying to honour traditional technical learning outcomes. Paradoxically we seem to have arrived at a situation in our creative problem solving programme that we had no room for a really exciting creative project!”

![Figure 2 Rebuilding of the AK Ilen, ‘the last of Ireland’s timber built ocean going sailing ships’](image)
DP: “Yes, Michael. The approach from the Ilen project leader definitely provided the spark for today’s Design Studio module. You and I decided that the students were well served with opportunities for exploring technical topics. Ilen highlighted the need to develop Design Studio as a space for autonomous learning and personal development with as few constraints as possible. Give students the autonomy to select a situation, environment, process or artefact they are passionate about and design some improvements. The topic does not have to relate to engineering in any way but comes with one caveat: the student must engage with the end-user of the product, process or service they are researching and incorporate the views and requirements of the end-user into their final proposals”.

MQ: “Actually Declan it wasn’t until we launched the new module format and you sailed into action that I realised your intention to decouple so completely from engineering!”

DP: “I think I was preoccupied with engagement, with getting energy flowing in the room. I had read a lot about the motivating power of pursuing topics for enquiry that are of personal interest, relevant and meaningful to the learner; Deci and Ryan\(^2\) are very persuasive on this and on the importance of autonomy in the development of intrinsic motivation. Daniel Pink\(^3\) adds to this, looking at motive and purpose in undertaking meaningful work. Moreover, the accrediting bodies allow some flexibility to deviate from analytical topics. Most Engineering Institutions define Engineering as an art and a science. I think we wanted to embrace this flexibility in the Design Studio problem brief”.

TC: “Well, the creativity aspect of Engineering is honoured in the written word by the professional bodies, but I am afraid, with the capture of the old professional schools by the University system, the art has been severed from the educational process, in engineering at least.”

DP: “I was concerned that the students should understand that Design Studio would be different so I laid out some thoughts that I hoped would help them get into the “zone”:  
• Individual diversity of experience and education brings “richness... to the problem solving process.”
• The module is intended to provide an “open-minded and supportive environment” to facilitate individual creativity.
• The module seeks to “re-awaken... childhood thought processes.” This requires the “unshackling [of]... traditional linear thought processes” that result from “rigidly structured, highly prescribed problems that focus on closed form solutions”.
• In our view ‘creativity’ has to do with the development of ideas that have value, and ‘design’ is the iterative process through which we bring these ideas to fruition.”

Design brief

MQ: “Preparing the brief was therefore an important first step in trying to model this different approach in some small way.

First impressions endure. I came across the brief for the James Dyson Award\(^4\) around this time and its look and feel echoed much of our thinking, so it provided a timely insight”.

TC: “From the outset the team embraced PBL as an approach to learning that is active and collaborative We were aware that all good engineering design is creative. Through reading the work of Professor John Cowan\(^5\) on reflective writing, I came to see reflection as a core competence and wanted to embed reflective writing within the programme\(^6\) and Declan was interested in reflective writing also. So, my educational value system became learning that is active, collaborative, creative and reflective. I came to appreciate reflection as a process of growing self-awareness, of examining experience to clarify where you are and where you should go next. I had experienced periods of taking stock as a kind of mental spring cleaning: freeing up mental space for the next step on the journey. Working with John Cowan has, I think, brought a critical edge into play: “What exactly do I need to learn? How will I learn it? Have I done so? What next?” It is interesting to compare how the values and abilities articulated here align with the UL Graduate Attributes”.

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**Table 1 Design Studio Module Map**

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<tr>
<th>Phase</th>
<th>Creative Challenge</th>
<th>Reflective Pauses</th>
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<tbody>
<tr>
<td><strong>Phase I</strong></td>
<td></td>
<td></td>
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<tr>
<td>Develop a Proposal (on campus)</td>
<td>Students choose 2 topics (artefact, process or situation) of personal interest, not necessarily linked to engineering. Research those topics and consider potential improvements. Tutors give guidance to the class, as well as meeting individually with each student on 2 or 3 occasions. Students develop two proposals before choosing one for further development.</td>
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<tr>
<td>Weeks 2-5</td>
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<tr>
<td><strong>Phase II</strong></td>
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<tr>
<td>Off Campus Retreat</td>
<td>Module activity moves to a city centre venue. A research phase is followed by an interim presentation on Wednesday with peer and tutor feedback on process and content. Final presentations take place on Friday. Invited speakers address the students on 3 mornings.</td>
<td>Workshop 1 &amp; Reflective Task 1 “Based on your experience in the module to date, identify the skills/abilities or dispositions/traits that you expect will be called for from you during the semester.”</td>
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<td>Week 6</td>
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<tr>
<td><strong>Phase II</strong></td>
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<tr>
<td>Portfolio &amp; Final Reflection (on campus)</td>
<td>Students create an e-portfolio detailing their problem, their enquiry and creative response.</td>
<td>Workshop 2 &amp; Reflective Task 2 “Complete your interim reflective self-assessment &amp; seek peer feedback” Workshop 3 &amp; Reflective Task 3 “Update and submit your final Self-Assessment with future actions for improved effectiveness”</td>
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<td>Weeks 7-11</td>
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MQ: “The module map gives a good insight into the workings of the module. It flows along two parallel tracks, one focussed on the creative challenge (led by DP and MQ), the other a triplet of reflective pauses (led by TC) moving through anticipation and planning, awareness and consideration of current experience and action and retrospective self-assessment of achievement and future needs.

**Scaffolding the creative process**

DP: “I might just expand on that table. Supporting a diverse group of students in a creative endeavour is a significant challenge. The process and drivers of creativity for each of us are diverse and intensely personal. Still, I think there are some common factors. I’ve been thinking about the steps that we felt would help to create the right environment for creativity. The main ones are:

- Online videos of creative people discussing their creativity
- Trial Run
- Inspirational leaders
- A free and restful mind
- The right spaces
- One-to-one discussions

"The process and drivers of creativity for each of us are diverse and intensely personal."
Sharing online videos of people discussing their creativity

DP: "I picked some videos that I felt might provoke students to think about creativity. John Cleese, the star of Fawlty Towers and Monty Python, has a number of internet videos reflecting on the conditions that facilitate creativity. Tens of millions have seen Sir Ken Robinson in his Ted talks, sharing his views on our education system and how it is killing creativity in young people. I think he is witty and perceptive. The Design Studio students watched and discussed these videos in the first week of the module and were then asked to critically reflect on their own daily routines, habits and educational arrangements and to consider how these may be influencing their creative abilities."

MQ: "I think one thing we need to consider in picking thought leaders is our students’ perspective: I agree John Cleese is highly creative and very funny and I certainly enjoyed listening to him, but I am not sure if our students relate to a comedian that was at his peak 30 years ago. They may be missing out from our point of view but it is tricky to figure out what they might be open to and who they might consider a credible role model."

TC: "Actually, I had a sinking feeling of disappointment last Autumn with third year when I showed them what I thought was a good ice-breaker: a short and very famous American comedy video [which I still find hilarious] from the 1950’s. The audience included Irish and American students but it went down like the proverbial lead balloon! Apart from struggling to bridge the generation gap, once it started, I realised that the space, the sound and vision quality were all wanting."

Trial Run

DP: "I introduced a short 2 week project. The students were asked to design a short course that would both inspire and help them become better engineers. The purpose of this exercise was not so much about the students’ products; rather, it was about bringing them to consider critically aspects of taken-for-granted familiar educational experiences. Every student offered a module traditionally structured as lectures, labs and tutorials. There was very little evidence of creativity or innovation in their thinking. The student output from this short exercise was intended to serve as a starting point for a discussion on what Design Studio was about and how our intentions [depicted in the following graphic] might be realised during the module, but I was disappointed with the results."

TC: "Actually, Declan, you may recall I dropped in and viewed the Trial Run posters on the presentation day and you shared your disappointment but I thought many of the proposals had evidence of some critical reflection on experience, even if they were not revolutionary. Actually in their written reflections, three students described their Trial Run proposals. Two used interactive digital resources and one used on-line delivery so perhaps their responses were not entirely traditional. Maybe you did better than you thought! It is true that most students (28) chose not to mention or reflect on either the videos or the Trial Run project. I think the positive impact of the off-campus week tended to concentrate attention there. This result could be judged a mark of success. Then again, the core project is usually about a useful object and even then they struggle to get started. To think about education, is, I think, very demanding because it involves reflexive self-awareness that is rare in the young and scarce enough in the more mature. We struggle ourselves with that challenge."

Figure 4 Key features of Design Studio
Inspiring speakers

DP: “I think personal encounter can be among the most powerful of human experiences moving us towards change. Fourteen years of a highly prescriptive and structured primary and secondary school education can leave the creative juices a little diluted. In an effort to concentrate the juices and loosen well-worn patterns of thinking, I invited a number of people to tell their stories to the students. I look to speakers who can deliver on the aspirations of the module: to encourage the students to think big, think differently and to believe in their own view as a valid and important starting point for learning, creating and presenting their ideas.

In his presentation, the founding president of the University of Limerick, Dr. Ed. Walsh (right) illustrated how, in 1972, his innovative approach of targeting niche courses, adopting a modular and semesterised structure and incorporating an 8 month cooperative education work placement in every university programme transformed university education in Ireland. The students were particularly enthralled by his passionate belief and determination which (against considerable inertia and political opposition) won the day and secured a university for Limerick.

TC: “It is interesting that, from your account it was his way of being, his spirit, that seems to have engaged the students rather than the details of his innovations.”

DP: “We were all delighted by the inspirational story of a lead female dancer from the global phenomenon that is Riverdance. What is particularly inspiring for me about this young lady, is her absolute determination not to settle until she had found her passion in life. On route to this goal she successfully completed two primary degrees; one in business and the second in life sciences and two post-graduate degrees one to doctorate level. Her studies were punctuated by the seven years spent bringing the creative and energising spectacle that is Riverdance to the four corners of the globe. She now works in education where she is an inspirational role model for all who have the privilege to meet and work with her.

“I was very inspired by one particular talk given to us by a former Riverdance dancer who has worked in many different professions, focused on working only in fields which interest you. After the talk I personally vowed to try to follow in her footsteps in the future”. Anon student

DP: “I believe when the timing is right the visiting speakers can allow the students to link bigger ideas with their own ideas”

“The guest speakers that came in were very good, especially the Irish dancer who taught me that there are many directions in life; and if you fail with one there is plenty of options.” Anon student

TC: “Confirming Declan’s intuition, this latter student then went on to connect this insight to their module activity”:

“That was like this project, where if you get stuck there are plenty of options – you have only to discover them. Anon student

DP: “Other presentations included an entrepreneur who spoke about his career in property development and in particular how he survived the worst economic downturn in Irish history. We were also treated to a fascinating lecture on the brain and creativity from a cognitive scientist.”

A free and restful mind

DP: “I am struck by how much the world of the Millennials is one of constant connectivity and bombardment with the latest news trending on the internet. Hardly the type of environment that is conducive to creative thinking. In an attempt to sever the digital umbilical cord, we held ‘mobile free’ Yoga sessions in the mornings of the week off campus (right photo). These sessions were popular with the students, they helped calm and de-clutter busy minds so they could function effectively in their creative endeavours”
The right spaces

MQ: "We have a campus that is very beautiful physically but timetabling that fragments time, no home base for students where they can explore and speculate. During the first cycle of the module, I was surprised at the effectiveness of being off campus: a rough and ready open space, a space that was somehow ready for new ideas, that needed new ideas that the students could make their own. To me Design Studio has two primary aims: firstly space and time for the students to explore something of personal interest to them. It is somehow amusing to consider that in so many documents we expect students to innovate when they are put through a system that does nothing to foster free exploration and choice. Secondly space and time outside the University environment."

DP: "I think a campus symbolises tradition, structure and familiarity. We wanted to break from this so in 2015 we secured a ‘bohemian’ loft space off campus in which the students would be comfortable, have a place to sit with plenty of wall space to display their work."

"I would attribute the reason for coming up [with] and solving the problem is the change in the place of work/studying which has had significant boost to my creativity." Anon student

We also needed a big enough space so people get away from one another and sit in a corner to think.

"I found that spending a few quiet minutes alone allowed me to relax and my mind could work naturally, rather than trying to force ideas to come to mind and becoming frustrated." Anon student

We are also keen to secure large chunks of un-interrupted time so students could explore and speculate on the myriad of ideas they generate on their project. We believe the ‘lecture-tutorial-lab’ framework, inhibits the freedom we were hoping to provide. Even if we had a full-dedicated week on campus, we believe it would not be congenial to the freedom of thought and imagination that we aspire to facilitate. Being off campus as a collective and with a collective goal is one of major successes of this module. The rough and ready open space in the centre of the bustling city was the perfect venue for developing and honing new ideas, a space that students could make their own."

One-to-one discussions

DP: "During the initial weeks of the module the students were considering their ideas for further study. This was an interesting process to observe – many students found the freedom to choose their own topic stressful and frustrating. They struggled even to identify a topic of personal interest when given the freedom to do so. The absence of downtime or even time to be bored seems to me to be impacting negatively on young people’s opportunity to unearth the things that truly inspire them; the ‘other interests’ or passionate pursuits division are not being well served in our digitally connected world. This is not a fixed theory, more a concern that seems to be true of many students today. Would this have been different in the past? I don’t know."
“I was very narrow minded to being afraid to commit to anything in fear it would be wrong.” Anon student

“For the first time in my studying career I had been give complete independence to do what I want to do. ... At the start ... I was uncomfortable with the situation....” Anon student

“at first I found it difficult to take the freedom into my own hands but towards the end I understood taking something with interest in your life gives you a lot more enjoyment. Anon student

MQ: “The series of one-to-one sessions with the students where their ideas were explored helped to address this issue. They needed some encouragement to outline the reasons they were passionate about the topic and why they felt it was worthy of further study. This interaction was often sufficient to get the creative juices flowing.

“Even though at the beginning I struggled with the task, after engaging with it, and creating a good environment ... to think creatively, I found it... enormously satisfying ...I was undisturbed by distractions and my mind was free to wander as it pleased....” Anon student

“Looking back on the project ... the most hard-hitting insight which I gained was into the enjoyment and pleasure that can be gained from working on problems and topics which you find to be interesting” Anon student

In a number of cases multiple one-to-one sessions were required by some students before they realised they had our permission to think for themselves on this project.

Some students experienced the unstructured time as a challenge:

“At the beginning I found it difficult to be productive and motivated when there were no lecturers there to egg us along. There were many hours I found myself off topic or procrastinating. I quickly realised that ...I had to change my ways. In order to motivate myself I began to write out a plan each day of what I was going to do...” Anon student

TC: “There is an interesting dynamic apparent in the students’ reflections linking freedom of choice, enjoyment and engagement [and discomfort] and creativity.

“We were allowed to be creative ..., at first I found it difficult to take the freedom into my own hands but towards the end I understood taking something with interest in your life gives you a lot more enjoyment” Anon student

“When we were given a free rein to study what we wanted it was brilliant, and when I was studying what I enjoyed it made me want to do the work” Anon student

TC: “I think Declan’s suggestion about the lack of passionate pursuits raises important questions. Michael noted that our students are put through a system that does nothing to foster free exploration and choice. So I think there is an element of being other-determined rather than being self-determined at work here. They may have interests but it seems to me that the education system has engaged with students’ interests as a way to promote student engagement with the system. They are long since conditioned to play the game of guessing what teacher wants and responding accordingly. The following quote I think illustrates that students are not so much without interests as habituated to disregard them when in a formal educational context. So, oddly, they have to ask themselves about themselves!”

“Automatically I thought to myself ‘This brief is too vague, I’ll never come up with a solution to it’ so I thought what am I passionate about? Gaelic football! Then straight away the ideas started flowing through my head.” Anon student

TC: “Not alone may students’ creativity be obscured by didactic approaches (above) but their minds may become closed off from unconventional possibilities (below)”

“The idea of spending a week off campus, missing out on lectures and tutorials to do a poster that was completely unrelated to civil engineering baffled me. I found it hard to see the point ... I know I wasn’t alone in this thinking, for some of my peers whom I spoke to felt the same way.” Anon student

TC: “I think the “box” metaphor in the following quote reminds us how thinking can be compartmentalised: school learning is unconnected with life. The student never says in his reflection what the chosen project was!

“At first I found this very challenging as it was such a broad brief and I found myself getting bogged down in finding an idea. I decided to look outside the box and choose something simple that I do in my spare time now and again.” Anon student
DP: “I wanted to encourage students to engage with the end user of a product or service as an important mode of research to inform their design. This will be a core part of their professional life: to negotiate and cultivate diverse relationships so I was pleased that some embraced this opportunity”.

“My confidence improved as the module forced me to get out and interact with experts in the field of basketball ...and pitch my idea. This meant that I was really putting myself out there .... I feel going forward if I carry on as I did in the module asking questions and trying to come up with new ideas that my confidence will improve further which will help me come up with even bolder ideas.” Anon student

In week 6 there were interim and final presentations with peer and tutor feedback. Many students choose presentation skills as an important development:

“The tutors in week 6 gave me some advice on improving my presentation abilities. This allowed me to focus on specific ways to improve it such as getting used to keeping eye contact to engage the audience, referring to my poster, not turning my back on the audience, speaking clearly and loudly.... I found that I had prepared a lot more for the final pitch for this project than I had with presentations in the past.” Anon student

MQ: “I am heartened by the range of topics that students have chosen over the last two years ranging from a ‘pop-up home’ for the homeless to form work systems for concrete shells, from improving the physical environment of an entire city centre to designing a “smart sliotar” or an unbreakable guitar string”. [A sliotar is the small pig-skin ball used in the game of hurling].

TC: “The reflective pieces do tell the inner story of experience, struggle, frustration, and excitement. However, the reflective task was an invitation to plan, generalise from experiences and look ahead rather than narrate. However I think the following passages reflects the kind of progression that was happening.”

“Having identified the problem I was going to tackle, which in my case was the labour and time consuming job of covering silage pits on farms, I then had to assess the problem .[to] ...find practical solutions. This process ... was completely new to me and although ... difficult it [was] enjoyable and rewarding. I ... had to identify what currently makes it impractical and then provide solutions for these impracticalities. Once you have ... solutions to the small problems then you can bring them together, which often involves making compromises. In my case in order to save farmers labour hours covering the pit with new sheeting and tyres each year, I proposed a reusable pit cover with which a farmer would have to compromise on cost as such a cover would be expensive to make. I feel that this project greatly improved my problem solving skills which I will certainly put to use when working as an engineer”. Anon student

“I did a lot of initial research into the current methods of farming and how these could be improved and exploited in a better way. I collated a lot of relevant information from this research which gave me great insight into how we as a global population could go about increasing our food production. I concluded with three different ideas on how to sustain or increase food production: increase yields on farms; alter people’s diets; and build sky farms. At the time I felt like I had so much research to compile and I was finding it very difficult to amalgamate my three very large ideas into one response to solve such a huge global problem. Through listening to the feedback after the initial presentation it became quite apparent to me that I really had to narrow my ideas down to one and focus solely on particular area of Limerick which could then act as a benchmark and serve as example to solve the global issue of providing enough food for the future. The reason of choosing the sky farm over the other solutions was that it had a closer appeal to me as my idea would regenerate an area of Limerick that has become dilapidated and run down.” Anon student

TC: “And another farmer!”

“This module showed the importance of research in any project you undertake

“At the start I had two ideas to choose from, my other was an adjustable arm support for welding. I decided to do some research into which would be more useful. I approached a friend who is a second year apprentice welder and a friend of my dad who is a professional welder, both said my idea had merit. I spoke to my dad and neighbours about the bale handler and they said it also was a good idea. I chose the bale handler as I had experience with it myself and more knowledge. Without this research I could have wasted time on an idea but both had merit so I had the luxury of choice. I researched to see if my idea had already been thought off and I approached end users for their opinions. I visited Rossmore engineering, who specialise in bale handlers, where I got constructive advice which I used to change my design. This module showed the importance of research in any project you undertake.” Anon student
Scaffolding the reflective process

TC: "I ran three reflective writing workshops as noted above. Professor Cowan had kindly agreed to act as a “critical friend” for the students by reading their draft reflective accounts and provide independent and confidential feedback to students to feed into their forward thinking. Many students fed back anonymously that having somebody outside the system as a sounding board was very helpful. A majority accepted John Cowan’s offer of feedback.

In the first Reflective Writing workshop during week 6 the students’ understanding of the module and salient experiences were explored. Their responses were gathered anonymously on post-its, tabulated and shared online. Students highlighted the shift in physical environment, freedom from distracting pressures and freedom of choice based on personal interest or desire. Other responses included reference to social skills, researching, having an open mind.”

In the final submissions some students reflected on the reflective activity:

“I’ll ask a question to myself, can you include reflective writing as part of what you have learned to do in this module? … last year … I felt I didn’t really grasp the whole concept … These few sessions with Tom have really put a new side of what reflective writing can do for a person. … if you don’t think back on what you have done. How are you supposed to improve on next time or certain abilities or traits you never noticed about yourself? This in turn will lead yourself to better future planning or creating more skills/abilities. I feel I improved on this over the semester and will be able to improve this ability more in the future” Anon Student

“Another thing I have been trying to improve is my reflective writing. …initially it [was] nothing more than an essay on what had improved over the course of a semester. Maybe I’m doing nothing different here but I feel now that I am thinking about it more and I am writing it for a reason. Now I am writing it for my course and when I do write it allows me to see the progress I have made it gives me an overall viewpoint of where I am in college which I think is very important because sometime college can be very overwhelming. I also think reflective writing could benefit anyone in any stage of life because it really makes you think of what you have being done and allows you to be slightly critical of yourself which could make improvement easier. This would be vital in my career because in my view nothing but the best is acceptable”. Anon Student

“This experience thought me that frequent reflection on my goals will allow me to maintain my focus on what the target of my efforts is. This process was therefore something which I practiced for the remainder of the module, to ensure that I was not drifting of theme for the remainder of the class.” Anon Student

Another summarised the impact for him:

“The Design Studio Module …has had a profound impact on me. Both as a Civil Engineer and a person… I came away from this module believing that my creative side had been enhanced, and my love for problem solving, renewed”. Anon Student

Module leaders’ reflections

DP: “I think designing and facilitating the module was a significant challenge for all of us. We believed that we would be able to stimulate students’ creative engagement with problem solving, by engaging them in problems and issues that they believed were interesting, but we had to experience facilitating the module in order to develop our understanding of how it worked.”

TC: “Michael, suppose there were no physical or human resource constraints and you had full flexibility on timing, what changes spring to mind that might improve the module in some way? What would your ideal “Design Studio” module look like?

MQ: “What would an ideal module look like if there were no constraints? This sounds like an assignment!! It’s hard in some ways to think in the absence of constraints.”

TC: “So you agree with our students about that!”

MQ: “Definitely! Time to focus on an issue is paramount. The right space is critical. Everything else follows. It takes careful tutoring. I often feel we are out of our depth. I think I can offer valuable insights along the way. Sometimes they help. Sometimes they don’t.”

TC: “So perhaps some coaching for the tutors is called for?”
MQ: “I think so”.

DP: “The space needs to be right. The “loft” space we had in 2015 was ideal to my mind but of course there were only 13 in that class. In 2016 we had what was, on the face of it, a good venue: a purpose designed educational suite in the heart of medieval Limerick beside King John’s Castle. But we had 32 in the class and I found the space cramped at times and certainly no nooks and crannies where a student could withdraw to ponder, sketch or write. There was less of a community this year (2016), but the cohort was much bigger, and the mix was different.

TC: “As an observer, involved only in the reflective aspect, it seems to me that Michael is right. It is time to think about what is required of us to help students to “get into the zone”. I think there are people working on the mental and emotional state of “flow” in creative action. We could learn from them.”

TC: “Do you think the module fulfilled your design intentions? What stands out for you as confirming that creativity did result from the module arrangements?”

DP: “Thinking about the products, I wouldn’t be holding the artefact at the end out as being highly significant as products. But during the semester and during the off-campus week a head of energy and motivation builds up by being in this special space together and being free of a timetable and being with colleagues and listening to them and helping them: I know from the reflections the previous year you can feel the sense of accomplishment, they were excited, motivated, giddy in a positive way, one person said: in a reflection ‘it saved the semester for us: it kept us engaged’. That is satisfying for me.”

TC: “Any plans for changing/tweaking the module in the light of the experiences you have had? Can you risk going further?”

MQ: “It seems to me that our achievements are both fragile and vulnerable. I confess my reflex at times is to keep out of sight of the system rather than to try to influence it!”

TC: “Yes we have dialogue with like-minded souls and we present at teaching and learning events and find some affirmation there, but my own experience is that by and large the system drivers are pushing in the opposite direction both in terms of the ”hidden curriculum” of 50 minute time slices of lecture-lab-tutorial pedagogy and in terms of what is valued for progression and promotion. At a strategic level our challenge is to translate our activity into a currency that is valued institutionally.”

A stirring end

TC: “Final thoughts? I think Design Studio has happened mostly in spite of the system than because of it. The machine with its habitual routines and unquestioned practices, left to itself, can so easily suffocate educational life. Being a reflective observer of Design Studio over two years has crystallised my educational concerns and strengthened my determination to continue looking for ways to configure our entire programme to vindicate those concerns on behalf of our students. I don’t see that struggle ending anytime soon.”

Acknowledgements

John Cowan has generously supported the reflective dimension across our entire programme including Design Studio for almost three years now. He has patiently given of his expertise and his time to both staff and students, engaging in voluminous correspondence and discussion with staff and providing feedback to students. These efforts are deeply appreciated by staff and by so many students. We look forward to his continued involvement and hope our modest achievements on behalf of our students justify his efforts.

Terence Ryan played a key role in the evolution of the Design Studio module into its current form of a week-long “retreat” off campus, and was part of the module team with Declan and Michael in 2015.

We acknowledge our past and present Heads of School, Prof. Conleth Hussey and Dr. Jeremy Robinson, both of whom financially supported the Design Studio module.
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End Note
Millennials (also known as Generation Y) are the demographic cohort following Generation X. There are no precise dates for when this cohort starts or ends; demographers and researchers typically use the early 1980s as starting birth years and the mid-1990s to early 2000s as ending birth years.