

The Challenge of Teaching Computer Game Art as a Subject within Higher Education: The Inherent Struggles with Technology, Student Behaviours, and Industry Expectations

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Abstract

In the modern global world of the creative industries there have never been more opportunities for students to be inspired and excited by their own potential.

The rapid advancements in hardware, combined with the explosion of the internet marketplace, mean that not only have new professional roles evolved from the chaos, but also that the aspirations and expectations placed upon Degrees has never been higher. This is compounded by the fact that in the creative world ability alone often offers the key to employment rather than academic qualification, unlike disciplines such as Law or Medicine when academic qualifications are required to practice.

In the light of this, Higher Education faces a very particular set of challenges. An area of particular complexity is that of art for computer games. Many students, as well as teaching staff, mistake the skills required in this area to be predominantly technical – and as a result focus on hard skills development perhaps better served by readily available commercial courses. Unfortunately, this often has the effect of students ultimately underperforming, and of industry misunderstanding the role and value that universities should be playing in their prospective employees' development.

The aim of this paper is to re-evaluate the way that digital art is taught within Higher Education - especially in area of computer games - where the artwork is only one part of a larger collaborative process, and to propose approaches and pedagogical considerations that may offer more lifelong value to students and their professional practice.

1. Introduction

In the early 1980's the videogame industry was in a fledgling state. The companies which produced commercial games – if indeed in many cases they could even be described as such an organised entity as a 'company' – were typically owned and operated by a sole trader, or by a handful of staff. These traders or staff were predominantly programmers. Scientists, mathematicians, experts in logic and process. The art requirements on these early games were by today's standards quite basic, but they were invariably effective. The technology on offer did not allow for the pursuit of near photo real imagery that some today see as the holy grail of graphics

development. Rather, the graphics on display served to stir the players' imagination and act as an avatar for them in their adventures. It is often described as a 'Golden Age' of games, when they served to spur on imagination and a sense of adventure (encapsulated in cinema of the time with movies such as *The Last Starfighter* and *Tron*). The limits placed upon graphics rendering did not diminish the success of *Space Invaders*, *Pac Man* or *Pong* and more and more players (predominantly young males) clamoured after more games that allowed them to follow in the footsteps of their heroes from books, movies and Role Playing games.

Inevitably, as Moore's law never fails to remind us, the game technology advanced to such a state that the customer's developing demand for visual complexity was attainable by the hardware. Unfortunately though, it was beyond the ability of the original development teams of programmers and designers. In order to meet the need for improved art content then, these 'development' companies started recruiting from art colleges and agencies where traditional artists who were willing to try their hand at this new form of art could be found. It was a strange new type of art called 'Digital Art' instead of Watercolour or Gouache, more specifically 'bitmap art' - now referred to typically as 'pixel art' by such developers as 4J Studios when replicating this now 'retro' style for the global phenomenon that is *Minecraft* on the Xbox. This work typically required the use of a mouse and keyboard over a brush or pen. It was many years until digital pens, cameras or even scanners would appear – yet the attitude of most of these artists was that the mouse was simply another tool, and they had used many in the past. Besides, the ability to save work, edit it, and back it up seemed like a godsend to all those who had spilt paint over artwork, or had lost it on a train, or had made any number of irreversible errors with pen and ink.

These artists gradually gained in skill and competence, embracing the new opportunities offered by the digital medium and the chance to further develop their traditional skills in new and innovative ways. In every area of art – from drawing to animation, from painting to lighting – over time the technology and demands of the computer games players drove forward what was possible. Artists began to specialise in particular areas, just as they may have if following more traditional avenues for their artistic talents. Gradually a set of identifiable roles began to form, evolving as new technologies and processes developed but still allowing younger

and less experienced artists an opportunity to plan their career path.

By the late 1990's, Universities had started to consider degree and tuition programmes that could offer qualifications in digital or computer arts. Partly this was due to the opportunities that research into digital technologies offered, and partly it was due to increased demand from prospective students and the perceived needs of what was rapidly becoming a games 'industry'.

Now, over a decade later, thousands of students study at universities in the field of Digital game Art. Depending on the nature or providence of the individual institution, the course's true nature may be masked under more acceptable terminology to governing bodies – but in reality, they are about making art for games. In less than 20 years, Game Art and affiliated courses have appeared at an exponential rate. Taking the UK as an example, UCCAS lists 102 directly relevant courses to study in relation to game art for the academic session 2012/13– though when complimentary areas of study and more specialist terms such as animation or concept development are added into the equation, the number is much, much higher. This would seem to show a great success story, a further indication of the much lauded 'digital renaissance' ushering in a new wave of prosperity and employment for artists and artistic development.

However, it is far from a straightforward process to teach and educate students in this area. The reasons are many and varied, with some unique to the discipline of game art and based in the quite unique intricacies of the craft in question - whilst others are more subtle. The body of this paper is based upon the author's experience as an educator in this area for ten years and as a practitioner in the field of game art for 20 years. In that time he has supported approximately 750 students as they pursue an academic course in game and digital art, as well as assisting, developing and approving University programmes within this area of study all across the UK as well as in North America and China. In addition, the author consulted with current industry practitioners – from all across the globe - as well as with recent graduates, current students, and academic colleagues. What follows below then is a discussion of the challenges that the author and his colleagues have faced in the area of game art education at the Higher education level, the impact that these challenges have had on student development and ultimate success within this field of study, and the eventual impressions from the very industry these students seek to serve.

2. The Challenges

Currently, the Higher Education system – as well as other areas of education – are seen as, '... failing

to provide graduates skilled enough to meet the demands of industry.' [1]. There is an inescapable fact that may add some clarity to this discussion from the outset. The original game artists were just that – artists. They had years of self-directed study and development, enquiry and research. These individuals were not aspiring to careers in art for any other reason than their love of the craft and the process. The games industry came looking for *them*, and was just one potential avenue to which they could direct their professional practice. Now, however, the vast majority of students looking to follow a career in art for games development are doing so because of their love of games – not art [2]. What this means is that typically they spend very little of their own time in art development, but rather they play games. The skills and comprehension of colour theory, perspective, anatomy and a plethora of other visually related sensibilities seem to be completely overlooked. Instead, they focus on trying to learn software packages that make 3D models, mistakenly thinking that this is the essence of all games art. Increasingly, the power and enhanced user support of these 3D packages means that these same students do not now even appreciate the basic underpinning skills of model creation such as topology and UV layout. This issue was identified by Alex Hope and Iain Livingstone OBE in their seminal review of digital arts education in the UK, recommending as a matter of urgency that there needs to be a shift in pedagogical thinking across the whole spectrum of education to, 'Encourage schools to promote art-tech crossover and work-based learning...' [3].

Occasionally some students focus on 2D skills for texture creation or concept art, but again they have not developed complimentary skills in photography or composition and can easily fall victim to developing a reasonable level of technical competence, but not being aware of how to actually use it. A simple example would be in the software package Maya, where shadows (if you switch them on) are black. A student may learn that shadows are crucial to the reality of a scene of course, but few realise in the rote based teaching they may expect to receive, that black is a human construct and does not exist in nature – so, to use it in artwork may immediately render it flawed.

The problem does not restrict itself solely to the actual artistic integrity or passion of the student though. There is also a widespread lack of appreciation of just how difficult any form of commercial or professional art is, and in the context of Higher Education Game art is an area of professional practice. Anyone can make art for a game, but a game artist can make art for *any* game. The choice of which area of game art specialisation a student should focus on is too often decided by that they can't do, rather by that they can. A poor career

strategy in any vocation. For instance, in a recent conversation when the author asked a series of students why they wanted to be Concept Artists, they each replied that they felt they couldn't model, animate, texture or design – but they thought they could, 'draw a bit'. This is wholly misguided. Professional Concept Artists can typically perform well in practically all these other areas of art, but they excel in the area of concept development (indeed, they typically use many of these other skills to aid them in their designs). To allow students to pursue their studies based on such a cavalier and amateur notion of what is required of a professional artist is to do them a grave disservice.

2.1 Higher Education in Digital Game Art Education.

The actual purpose of Higher education can become lost quite easily in the current political and economic climate. It used to be quite simple. Higher Education was just that. A place where higher thinking, enquiry, investigation and research could lead to an individual's greater understanding of a subject or issue. The skills students learned and employed while studying this higher form of education would give them lifelong skills that would serve them in all areas of their intellectual – let alone practical – life.

Somewhere, things became very confused. In the terms of the UK, many would point to Margaret Thatcher's upheaval of the Higher Education in the 1980's, but there has been an undeniable global shift for many years with HE to a more commercialised portfolio within universities. This in itself is no bad thing, and reflects the growth in new industries and areas of potential enquiry that Universities may help develop, but when twinned with the political demand that practically everyone should have access to a Higher Education, the consequences can be quite marked. The Higher Education aspect can become lost in the pursuit of recruitment numbers and industry relevant courses. Simply put, the risk is that students are just taught what the job requirements are for employment and are assessed on their ability to hit those marks, rather than their ability to show any real sense of deeper understanding or personal growth. The degree becomes a ticket for employment, rather than for intellectual or personal development. In the words of a Games Company Art Director with the best part of 20 years' experience, '...we expect graduates to be able to think for themselves and work out solutions – not to always look for the answers to be given to them'[4].

Higher Education is about supporting Learning, not rote based teaching.

In the field of Game Art there are many extremely good commercial training packages both in book form and online. While it is beneficial to

have personal contact with a tutor for basic skill acquisition, many offer these resources too through email, community or other means of mentorship. It seems that many University courses focus on teaching the basic fundamentals of software packages, where in fact there are far easier and more appropriate ways for students to learn these skills away from the classroom and in their own time, at their own pace. At University, the classroom and contact time should be used to take these skills the students have learned in away from the tutorial sessions, and apply them in interesting and engaging ways. This sense of engagement should then lead the students to seek out and develop their skills further, until the next tutorial session or meeting with their lecturer. This model is similar to that employed in courses such as Law, where students would read up the requisite legislation away from the classroom, and then in contact time with their tutor they would be helped to contextualise and implement this knowledge in ways that would engage them. In this way, Lecturers act in the way most expected of them traditionally – they act as a source of inspiration, motivation and direction. They do not act as teachers in a classroom, leading an obstinate collection of reluctant individuals through a potentially new and bewildering discipline at a set pace dictated more by timetables and resources over which they may have no control.

In this context, it absolutely imperative that students and staff alike appreciate that *all* artists are self-taught. So are musicians, athletes and practically any other form of endeavour where the very nature of the craft is built upon personal interpretation, practice and trial and error. It will of course offer benefits to read books on the subject, attend workshops and classes, to engage with peers and practitioners whom you admire. Eventually though, it all comes down to an individual's dedication.

The unique abilities of an artist are never based upon their core technical competencies, but rather upon how they interpret these abilities through their own inherent passion and interests. The part that the mere technical process plays in this is unfortunately what many HE courses seem to focus on, rather than seeing this as mere the starting point. Returning briefly to the point made above, these basic skills can be acquired by any number of means out with University – but it is the duty of the Lectures and the Higher Education establishments themselves to ensure that the part they play in the process is truly that of achieving 'higher' learning, well beyond the drop down menus and the buttons. If the courses themselves don't lay out a clear difference in delivery and assessment between school, commercial courses, further education and higher education – then how can the students at any of these levels possibly hope to understand the different expectations placed on them?

2.2 The Challenge of Technology

The software does it all for you. A very common misconception, leading to a fixation with the functionality of a software package rather than an in depth understanding of the processes it is emulating. Alex Hope summarized the point perfectly when commenting that, ‘...once you have the science, you then need to take an artistic eye to it.’[5]. A light in a software package will be white by default. However, if a piece of game art is meant to be set in the Scottish Highlands, It should be set to a pale yellow, in other regions it may need to be red, or blue, or even green. The software will not do this for the student automatically – it doesn’t know what the end result is meant to be.

Software is increasingly powerful, but it seems for every advance the software makes, the risk of students’ comprehension of the underpinning principles diminishes in turn.

In 2004 when developing their series of Formula One games for the Xbox and PlayStation consoles, Electronic Arts brought in the actual cameramen from Sky sports that filmed the live events around the world. The cameramen showed them where on the virtual tracks the cameras should be placed to most accurately replicate the television experience most players would be familiar with. The camera locations, settings and lenses were all replicated as closely as possible.

There was no suggestion that an artist at EA would simply drop in a default camera, with the default package settings from Maya or 3DS Max.

Yet students may be encouraged to think that simply by even *mastering* low polygon and high polygon modelling pipelines, they are in any way qualified to build a competent figure model. This makes no more sense than an experienced domestic car driver expecting to win a Formula one Grand Prix just because they know how the steering wheel and pedals work. The successful creation of a figure requires detailed knowledge of character design, posture, anatomy and proportion. If that figure is to be clothed then textile and fashion design as well as knowledge of jewelry and all manner of other elements as required by any particular design.

In 1893 when Charles Burdick invented the airbrush, there was an outcry from artists of the day who that they would be rendered creatively – as well as financially – redundant. This never came to pass. The reason was simple. While the process of covering paper or canvas with even smooth tones had become easier than ever – wiping away in an instant the requirement for many years of practice – very few people actually had the insight or artistic ability to employ it effectively. A new type of art was formed, but one that required just as much artistic integrity to use to good effect.

It is the same, over a hundred years later, with many forms of software. The power is incredible, but there is little evidence that the proportion of individuals in society artistically skilled enough to use them beyond their basic functions has increased at such an exponential rate. That is not so say that practice cannot vastly increase the effective use that such software may be put to – professional competence is indeed 5% inspiration and 95% perspiration – but the lack of appreciation that an incredible amount of personal effort must be spent to fully unlock the power that software holds is seemingly present in many students.

The issue of technology does stop with an under appreciation of the personal investment required, however. In Higher Education there are other factors that must be considered.

2.3 Newer and easier is always best.

The latest and best software is not necessarily the best to use in classes or projects. The stability and compatibility of software is almost always an issue – it is a wise rule followed by most IT departments that software is never revised or updated as a matter of course mid-way through a teaching semester. If unmonitored, student work – and lecturer’s work – may no longer run, or may lose compatibility with older work or hardware.

The second issue here is perhaps more apparent to some, but appreciation of the problem very much depends on the true goal of the teaching model in question. That is, the issue of how easy or straightforward some software makes various processes and areas of development. The flip side in many ways of the argument above that software does not in fact do it all for you, what if some software actually appears to – in some areas – do that very thing?

If the purpose of the education is to ensure the student has a firm level of ability and knowledge in for instance game art pipelines, the worst thing that could be done would be to give them access to an engine or editor where all the work is done for them. Recently, after delivering a presentation on this subject, the author was contacted by a game engine vendor. They explained that their product made the whole process so friendly and easy that anyone could now make a game. The question then followed, what purpose does it then play in allowing students to develop their true ‘higher’ level of understanding of the processes involved, if at every turn the software produced adjustments, corrections and alterations to ensure that no matter how sloppy the student was success was guaranteed. The most the student could hope to understand at the end would be how to use the editor, as any other failings or lack of comprehension would be completely masked by the software. Quite aside from delivering a deeply

flawed educational experience in itself, how can a student effectively be assessed when so many of the critical elements are actually hard coded for success by someone else?

Thirdly, in collaborative projects with industry the issues concerning Intellectual property rights (IP), Non-Disclosure agreements (NDA) and lack of technical support can mean that these projects with industry partners while on paper beneficial to students actually provide more obstacles than positive experiences. It is often better for such live or industry related projects to be based upon mentorship and support rather than actual entrenched projects, at least if the potential consequences have not been carefully mapped out and considered.

2.4 Industry expectations.

Possibly the greatest challenge that higher education institutions and their students face in terms of engagement and motivation, concerns industry the expectations placed on them, and how industry can perceive them.

In many cases, such as DMA Design, the early game companies were not formed by graduates or individuals with a higher education. This was relatively simple to explain – there were very few relevant courses, and it was primarily a hobby based enterprise. This translates down through the years as an element of skepticism amongst some older developers as to the value of a higher education at all, when it comes to their area of practice. The risk is that the understanding of the higher learning aspect is missed completely, in favour of a recruitment based approach.

It has already been discussed how students who approach a Higher Education in game art just to find employment, may be doing themselves and their peers a great disservice. The majority of games companies however, are guilty of just the same approach. They see Universities as a recruitment centre. This may be understandable – particularly if they have had the foresight to engage with the courses and offer assistance and support – but the worst element from a lecturers point of view, is being blamed if the students do not seem to meet the needs of that particular company. An HE institution can no more ‘make’ a student excel any more than that mythical cowboy can take his horse to water and ‘make’ it drink. There have been instances where artists from leading franchises such as Grand Theft Auto and Crysis have put forward artists to teach students game art, only for the majority of students to drift away or fail to appear at all – favouring the student lifestyle over the opportunities to learn. The students may be assessed and graded and accordingly, but it seems many games companies and recruiters don’t actually understand – or bother

to interrogate – the actual marks or degree classification that a student has been awarded.

Similarly, the industry as a whole will generally come looking for short term solutions to its needs. Until as recently as five years ago, an average game development would still be measured in years. Typically a good quality product for PC or console (there was no social or mobile market to speak of) would take between 18 months up to several years. This meant that games companies would take a longer term view of a prospective hire, may give them a few weeks or months to acclimatise and would see them as a long term investment. If the candidate did not meet their exact needs but they saw potential, they may hire them on that basis as form of investment for the future. Unfortunately for employment, the speed of development now and the very narrow opportunities for profit mean that this is now rarely the case. A company will typically need the student or graduate to be effective from day one – at a professional level – and yet that project may only last for a few weeks or months, after which the requirement for that new employee may be precarious indeed.

The short term goal that many within the industry now need to focus on themselves, translates uneasily to an academic programme running for fixed semesters, with approval processes carried out only every few years.

Occasionally, the worst form of misguided support from industry takes the form of programme or teaching reviews where they state that their company’s way of carrying out a particular task or process is ‘The Way’. A problem relatively unique to the games industry is that there are not really any set standards, anywhere, at *all*. There are no uniform job titles, roles and task allocations anywhere in the games development world. What may be called a games artist in one company may be a Visual Engineer in another, and a Graphic Designer in another – all similar, all different. As the games industry expanded, it pulled in many other practitioners from other professions such as managers and commercial directors, and they all bring their own unique spin into what it already a chaotic mix. If the industry itself has no set standards, job titles or expectations of a role, how can HE hope to meet their requirements?

An example of this would be Character Modeller. Many students think from looking at books and games that they should go off and completely realise a character based on a design that they’ve created. However, they take ownership of many different disciplines if they do this. Typically in a large studio the character would actually be designed by a concept artist, the mesh would be built by the modeller at his direction, another artist may lay out the model ready for painting or texturing, another would paint it, yet another would rig it for animation,

then an animator would actually animate it. Every one of these stages is seen as a professional role in itself in some companies, yet on other – typically smaller – companies, perhaps one artist would indeed carry out the whole process. However, that would have to be a talented artist indeed, and it is complete conjecture to speculate what that generic title for him or her may be.

It can lead to confusion if students take a literal rather than informed view of the nature of the industry, ‘I see a lot of artists’ work but they almost always fall down on basic anatomy. The models are built nicely enough, but are no use to us.’[6]. Frustration can grow quickly as definitions and expectations placed on them seem to fluctuate wildly.

2.5 Student expectations

In the worst case, students think that becoming an artist is something someone else can do for them – that attending a 12 hour module will make them a modeller, for instance. In some cases it is laziness on their part, perhaps a reflection on their expectation of education based on their prior experience where they essentially learn to sit still and don’t cause any trouble, and survive until the end. As attendance of an HE education is not compulsory – all students are ‘volunteers’ - this is a bewildering attitude that doubtless all lecturers and tutors face from time to time. Nevertheless, if a student is not willing to broaden their own skills and development, then in the field of art education - be it game art or any other form) – the diligence of the lecturer will make little difference.

The students *must* see teaching slots and contact time with teaching staff as supporting their own practice, not replacing it. In a recent post Module assessment form, a student reported to the author that they had enjoyed a particular course in 3D and had learned a lot, but that they had had to practice at home outside of classroom time to really get a grasp of the subject matter, which didn’t seem right to them. This seemed to summarise the issue, that even with a subject matter that they enjoyed and felt benefit from, this student thought the only time they should have to spend each week to master a very complex area of practice, was a two hour lab once a week. This makes no more sense than a person thinking they will learn to play the guitar to a professional level by only picking it up for an hour each week for a lesson every Tuesday night. Such a suggestion when it comes to music would be met with widespread derision. It is a cause of concern that so many young people who have decided to try to make a career in game or digital art should be so dismissive of the effort involved. A recent graduate from who is now a very successful Games Artist commented that, ‘While I learned a lot from my time

at University, it still took a lot of effort and practice in my own time and beyond university to eventually reach the skill level required’[7].

In terms of game art, it absolutely must be generated in a collaborative and if possible a multidisciplinary team based environment or project[8]. A digital asset is not a piece of game art until it is functioning as required in the game and is practically impossible for an artist working alone to experience this process in a professionally relevant way. In reality, requirements change, code breaks, styles are modified and iterated. While the use of a game engine may be set up to mirror the experience and allow the artist to get their artwork into a game in some form, it is a poor substitute for a team experience. In a recent game project at the University of Abertay, a very well qualified undergraduate art student was working on the Master of Professional Practice in Games Development programme, when they were asked to change some artwork. It was pleasant enough, but did not meet the required style of the game – it was in her own style, which was not that of the game. It was four days until she returned to university, quite emotionally traumatised. It transpired that never, in her four year undergraduate Art college degree, had she ever been asked to change something. Her course had been about self-expression, as many art courses are. However Game Art as noted above is a profession, typically for other people and under their direction. Rarely if ever do the projects meet the artist’s preferred style or interests. If such a personal level of artistic satisfaction is required constantly – and their work suffers if it is not – they will not succeed in the industry.

If students fixate on their portfolios instead of the needs of the game or project, then they will not only suffer from frustration in trying to hit too many objectives, but they will most likely be unsuccessful to meeting the needs of the project[9]. It is too often the case that from day one of their education, students are trying to fill their portfolio for employment. The course of study they do and what they deliver for the course may be completely inappropriate for their eventual employment portfolio – but every piece of work and development they carry out in HE should hopefully make them better prepared and informed for the eventual portfolio they create. It is very similar to industry itself, where the work an artist carries out for their employer or client may be suitable for portfolio – it really depends what they want to show – but more likely, their portfolio is work of their own created in their own time based off the skills and experiences they have gained during their employment and personal practice. It should be identified and discussed immediately with the student, if teaching staff become aware that they think that their portfolio is only going to reflect work that other people made

them do – namely, work carried out for exams or coursework. Employers always want to see an artist's own work as well as the occasional professional piece, to see their own inspirations and motivations.

A trick employed by some educators is to ask an art student what they did last night, or the night before. If the response is not that they created art in some form, then it is suggested to them that they are not artists. Artists do not create art because they are told to, but because it is what they live to do. This is an extreme example of course, there may be any number of reasons why in that exact time frame it is not possible to create some art – but the point is usually successfully made. It takes little time to doodle, to sketch on an envelope or use a smart phone or such for a creation tool. In the worst situations, it typically transpires that students who claim they wish to be 3D artists, hadn't switched the software on since last week's class. This should be carefully discussed with the student, as everything else being equal; they are not well served by continuing to delude themselves that this is their area of passion. It is, '...all about the passion you can bring to the projects, to your professional work – there are easier ways to make a living, a game artist must love the process and the challenge and that is what makes them want to come to work every day'[10].

2.6 The Reality of Game Art

As distinct from other areas of art – even areas of digital art – Game Art is always built for a purpose. First and foremost, it must function [11]. This is typically a technical issue but students who are not used to budgets of scale, file formats and naming conventions will struggle initially to understand that the creation of the artwork itself is invariably the easy bit (and all the more reason therefore to downplay that element in the teaching support). The quality of the art created is a different matter, and relies on and the elements of passion and motivation discussed above – but the technical restrictions and processes are usually overlooked by the uninitiated. Beyond the core functionality and suitability for purpose, the art created has to fit another person's direction. It may very well be someone that the artist never meets, and they must interpret written or somewhat obscure notes accurately. An experiment that the author carried out for several years was as follows:

- i) The students are asked to write down a 250 word description of a character. It should not be costume design – which so many confuse with character design.
- ii) Much to their surprise - thinking they were going to create their own design in the next step, these notes are the passed to the student sitting opposite –

who then has a set time to design a character visual in response.

iii) Finally, the design visual is passed to a third student.

The test is to see if the third student can accurately deduce the character described in the initial text, from the visual. It tends to be a powerful experiment in showing the students not only the difficulties in articulating a design in ways they may not be used to, but also how to interpret another's artistic language.

This is a small example of what is typically termed a development 'pipeline' – a sequential set of processes within a team based environment that lead from the initial idea to the final realised product. The whole game development from initial design through to release is typically regarded as a pipeline in this sense, but as we can see it is actually broken down into many other small collaborative efforts. If any one of these efforts is out of synch, the whole pipeline comes to a grinding halt. This is why, to operate professionally in the area of game art, the students must have experience of these processes and both understand and appreciate the roles and responsibilities everyone has.

The second they place their own portfolio ahead of the pipeline, it breaks.

The irony is that while such an awareness and understanding of process is critical for success, not a single one of these issues would even arise from expert but isolated training in an art package such as Maya or Photoshop – yet many course deliveries focus on just that.

3. The Goal

The goal of HE in the field of game art, then, should be to:

- i) Ensure that through support and guidance in their studies the students understand that their role is to use the appropriate technology for each task, efficiently, in order to meet the determined artistic style of the project. This style will probably be from someone else. They must not lose motivation because of this, not fixate on their portfolio work or overt personal development when other tasks have priority
- ii) Develop the students' ability to identify the best solutions for each challenge – using the breadth of awareness and skills they have accrued through their own periods of directed and personal research and enquiry.
- iii) Engage the students passion as an artist first and foremost, with the appreciation that the passion and skill they have in digital art is no different from any other form of art, where time with a tutor is complementing and enhancing their own practice, not replacing it.

iv) Direct the focus of the pedagogical model towards the assurance that by the time successful students complete their programme of study and have finished their time in HE, they have accrued a set of lifelong research and enquiry skills, attitudes and responses that allow them to meet their career and life aspirations in the future. The focus should not be on immediate short term employment goals which offer no depth or substance to intellectual growth.

3.1 Proposed solutions

In order to achieve these goals, there are several elements of practice and support that an HE institution can employ to try to encourage and best motivate the students to become effective practitioners. While discussed throughout the paper, these can be summarised as follows:

- 1) Ensure that contact time with students in spent in the best traditions of Higher Education, and is not confused with other teaching institution levels of study. As a wealth of software information and training is available online and from books and forums, why stand up and repeat this in class sessions? Instead, use student contact sessions for comprehension, understanding and application of the lower level skills acquisition they could have been tasked with investigating before meeting staff to explore it further.
- 2) Target in the students the development of core underlying skills required, not short term goals. As the requirements placed on them both technically and professionally will change rapidly and often throughout their chosen career, it is the core skills that will sustain their longevity as a professional.
- 3) Encourage group projects if possible, with practice over rhetoric and with disciplines working together. In this era of online courses and remote learning, this is an area that traditional HE models of on-site teaching can flourish by bringing different disciplines together in a live project setting and allowing them to experience a genuine team environment.
- 4) Encourage industrial involvement, but be aware how it is applied and interpreted. An undeniable potential benefit to both staff and students in most cases, nevertheless the aims of the industrial partners will not be the same as the HE institution, but both can effectively work together providing mutual respect of one another's' role is maintained.
- 5) Encourage artwork based off others' designs, not their own, removing prejudices of style. As a professional artist, most of the time is spent interpreting work for others who do not have the artistic skill or time to do it themselves. Any student of art, who has only satisfied their own artistic vision

for all the years of their study, will find the world of the professional artist to be extremely unsettling. The most common phrase heard is their 'comfort zone'. Few professional have a 40 year career working solely in their comfort zone - indeed, many reserve the comfort zone work purely for their own personal portfolios. Students should be aware of this, and act accordingly.

6) Keep technology taught, to be core rather than use easy editors or software which removes a lot of the educational value of the process. The students will learn nothing other than the menu structure of the editor, and who first having to think for themselves in a real world bespoke piece of development software within a company, they will find they have not developed the skills to adapt.

4. Conclusion

The Games industry is in many ways a victim of its own popularity. So many students approach a career in games simply because they like playing games, and not because of any true sense of engagement in the craft required. As academics and teachers, the onus is on the Higher Education establishments providing courses in this area to develop within these students a genuine artistic passion and spirit of enquiry– not through the use of ever simplified technology, but rather by a return to the appreciation of basic art principles and practice. While the technological competencies required of a practitioner of game art are substantial, they do not require a course in Higher education to attain them. Rather, these courses should play their part in expanding the appreciation of just what these technologies can be used for, and the additional sensibilities and passion that are required to make best use of them for years to come.

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6. References

- [1] Alex Hope and Ian Livingstone, Next Gen Report, NESTA, London, 2011, page 8.
- [2] Panel discussion with Game Company CEO and Art Directors from Denki, 4J Studios, Tag Games, Binary Pumpkin, Outplay and EEgeo, University of Abertay Dundee, July 22nd 2012.

[3] Alex Hope and Ian Livingstone, Next Gen Report, NESTA, London, 2011, Recommendation6, page 44.

[4] David Keningale, Art Director, 4J Studios, Dundee in an interview at 4J Studios, Dundee, on the 14th of March 2013.

[5] Alex Hope, Next Gen Report, NESTA, London, 2011, Page 18.

[6] Gordon Brown, Character Artist for Rockstar North, interviewed at University of Abertay Dundee, November 17th 2010.

[7] Chris Goodswen, Character Artist, Crytek Studios Hamburg. Interviewed from the University of Abertay Dundee, 15th March 2013.

[8] Frank Arnot, 'Working in a Team for Games Development', Seminar, University of Abertay Dundee, Dundee 11th March 2013.

[9] Stewart Graham, Outplay Art Director, 'Game Art' Presentation at the Centre for Excellence in Games Education, AMG, University of Abertay Dundee, Dundee, February 10th 2012.

[10] Paul Farley, CEO TAG Games, 'Professional Practice in Games Development' Seminar, University of Abertay Dundee, Dundee, March 20th 2013.

[11] Grant Clarke, Game Developer and Lecturer, 'Game Pipeline and Development' Seminar, University of Abertay Dundee, Dundee, September 21st 2011.