20 Years of Computer Games Degree Programs: From Abertay in 1997 to York in 2017

John Sutherland¹

Published online: 23 November 2017
© Springer Science+Business Media, LLC 2017

In September 1997 the recently-titled University of Abertay Dundee, at which I was one of the computing lecturers, launched the academic world's first degree title in computer gaming: the MSc in Computer Games Technology. Although this was not the first study program in computer games, it was the first to attach the name Computer Games to a degree name. A particular nod is due to Bolton Institute of Technology (now University of Bolton) which had possibly the first games programming degree in 'interactive entertainment'. However, the Abertay degree stands out as a genuine innovation which broke new ground and set the direction of travel for today's hundreds of study programs in many countries.

The degree was one of three to be launched annually as they were developed. The MSc CGT was based on an existing successful MSc Software Engineering top-up degree which accepted BSc Computing Science graduates and turned them into specialist C++ programmers for such as the then burgeoning DEC Ultrix and SUN SunOS workplace, this degree had been developed by Dr Colin Miller and Dr Dennis Edgar-Neville. I, who had recently joined the faculty from The University of St Andrews, had the privilege of running the degree course.

The timing and location of the event was critical also. Prior to the recent launch of the Sony Playstation computer games had been either text or 2D graphics based. The new console from the Japanese consumer electronics giant had introduced the capacity to develop and play 3D games for the first time. The games industry had a problem: its programmers could not handle the Mathematics and programming languages for real-time 3D graphics programming. The new Sony console had also upscaled the games industry from being a minor player in the home consumer marketplace, relying on programmed games running on generic home computers, to being a potentially major, clearly-focussed industry.

✉ John Sutherland
akademos@btinternet.com

¹ Skelmorlie, UK

The Abertay faculty had a close working relationship with local computer manufacturers, such as NCR where, by a strange coincidence, the first banking autotellers were manufactured 40 years ago. Just along the Kingsway ring road in Dundee from NCR was the Timex plant where the Sinclair ZX and Spectrum home computers were manufactured. It seemed that every computer programmer in Dundee possessed a Sinclair computer, and many of the city's students were busy writing games for the cover-disk market.

One former Abertay student, David Jones, wrote the *Lemmings* game and launched Dundee as a global industry hub. In 1996, I had been seconded to work as Visiting Professor of Virtual Reality at the VR Centre of Gifu University in Japan, and was working on 3D modelling of buildings, vehicles, landscapes and seascapes on Silicon Graphics workstations. Abertay University asked me to head up the development of a video games development degree portfolio, together with Professor Iain Marshall, Professor Peter Astheimer and Dr James TerKeurst (two of whom still serve on this journal's editorial board). This team was supplemented by local computer games industry representatives and national 3D graphics developers led by David Jones.

Creating a new academic field is not one for the faint-hearted. Perhaps this can only be done by those who are younger more than they are wiser. The validation event for the proposed Master of Science in Computer Games Technology and Virtual Reality was a difficult birth, at one point nearly collapsing in anger, acrimony and accusation. Tragically, in my opinion as the lead degree developer, the 'and Virtual Reality' suffix was not agreed. This effectively separated the new degree programme from its obvious academic foundations in Software Engineering and Computing Science. The result of this 3-hour debate set the future direction of academic studies in and around computer games development. There has been discussion since as to whether the noun 'technology' also pushed similarly-named degrees into the 'technician' category, but this has not been so.

The MSc CGT was designed as a 3-semester introduction to the world of 3D graphics games coding, which also allowed the academic staff to get familiar with the new field. Not having a clear academic foundation made it particularly difficult to categorise and identify the boundaries and contents of the field, an issue which has not gone away and that still affects the perception of computer games as an academic field in such as the UK's Russell Group and similar highly-rated universities which are historically slow-adopters of novelty subjects.

In 1998 the 4-year/eight-semester BSc (Honours) Computer Games Technology was launched to, by now, national attention, attracting the highest-qualified cohort that Abertay had seen. A deliberate decision had been made by the development team to require notably strong students, and with a strong nod to the university's Computer Science faculty background, Mathematics was the only specific subject requirement for applicants. This proved to be correct and defines today's clear dividing line between strong computer games development degree programs which create the kind of graduate programmers required by the industry, and the plethora of weak-but-attractive programs of study. Quite simply, there are two core Computer Science values which have proved to be central to computer games

development: first, it's about programming; second, it's strongly focussed on mathematical modelling in code.

Of course, there are other positions in the games industry apart from coding. In 1999 Abertay launched, still from its Computer Science department, a BA (Honours) degree in Computer Arts which, surprising, breezed through validation. Dr James TerKeurst and I wrote the degree, and other specialist faculty personnel were recruited to teach this combined visual arts/sonic arts degree (including Ms Inga Paterson; and Dr Kenny McAlpine, who also sits on this journal's editorial board). Unlike the BSc CGT degree which has changed little in the past 20 years, the BA CA degree soon after was altered significantly to align it more closely with the Arts and away from Computing.

It is Abertay's BSc CGT degree which has proved to be iconic, successful and lasting. This has set the standard for the UK's charter-mark for computer games programming degrees (see creativeskillset.org) and so has become the template for other establishments seeking to gain valuable independent accreditation support for their degrees. However, of the 24 Skillset accredited games-related degree programs (which include several non-technical offerings) none are in the top 50 UK universities (thecompleteuniversityguide.co.uk/league-tables/rankings) nor do any of these highly-rated universities offer taught degree programs in computer games.

A further weakness of the field has been an ongoing inability for computer games to emerge as a clear academic subject as reflected both in university structures and as a research field. At best, a group of faculty might be identified as being computer games lecturers, but the field has not emerged at what would be recognised as department or school level. There is even disagreement as to whether the field is part of the Creative Arts or belongs within Computing Science or even Management Science. For an academic group to possess computer games it comes with strong pluses (high profile, well-qualified students and high student numbers) but it also has significant minuses (technically costly to deliver, poorly-supported in the academic literature, and distractingly high-profile.)

Finally, particularly in the context of *The Computer Games Journal*, the field of computer games has never achieved critical mass as an academic research and publication field. This may be reflected in its lack of take-up in leading universities who have traditionally seen their subject fields as being worthy of scholarly activity through research and teaching. This is not new; every novel academic field has to storm the battlements of established academe. If it cannot, it has not proved its worth. For example, the hugely-respected academic and writer CS Lewis was embattled as he tried in the early twentieth century to embed English Literature in the academic fields' canon (McGrath A (2013), 'C.S. Lewis—a Life', Hodder: London).

Computer games-related research goes on widely across the universities and their departments. Papers are published by management scientists, software engineers, visual artists, musicians and educationalists. Unfortunately, most of what happens in the games industry cannot be published due to intellectual property concerns. A games studio may be unwilling to allow leaks of their valuable IP before launch, or they may be silenced by sub-contractual restraint from the IP holder. In most cases the work of a games studio is so focussed on product development, budgets and

deadlines that the thought of committing thoughts to paper for a third party to read and consider is as alien an idea as a gun-less shooter.

However, there are gleams of hope. One of these is IGGI at The University of York:

The EPSRC Intelligent Games and Games Intelligence (IGGI) Centre for Doctoral Training is a collaboration between The University of York, The University of Essex and Goldsmiths College, University of London. It will train the next generation of researchers, designers, developers and entrepreneurs in digital games. (cs.york.ac.uk/postgraduate/research-degrees/iggi/)

IGGI is a collaboration of three localised parts to create a greater whole. I was privileged recently to attend their annual public event and to see how students at each centre benefit from access to staff and resources at the other centres and the greater feeling of collegiality from being in a computer games focussed cohort of critical mass. Whereas in a typical university setting a computer games research student would be embedded within another field setting, mainly encountering staff and students of non-relevant disciplines, IGGI provides a structure which seems to allow students and staff to feel part of a greater whole entirely focussed on computer games, albeit running across a wide range of established academic disciplines.

To return to the issue that few of the universities offering computer games degrees are centres of excellence in research, it is notable that the three partners in IGGI are York, Essex and Goldsmiths University of London which are 20th, 36th and 51st respectively in the combined UK university rankings. This bodes well for computer games scholarship in the United Kingdom (or, at least, in England.) Similar groupings, from my list of known scholars, could be established in Scotland, Ireland and Wales. But, perhaps that is wishful thinking. It has at least proved to be possible through the University of York's IGGI Centre.

In summary, where do we now stand 20 years on in relation to the field of scholarship in computer games. First, much has necessarily been left unsaid as it applies to every field: there is some poor work, repetitive work and even downright dishonest work. It is our intentions as the Senior Editors of the Computer Games Journal to sift these out ruthlessly and continue only to publish work that is of worth. As a teaching area the field has grown numerically but not in depth or range of degrees on offer. There continue to be a large number of of games-entitled degrees on offer which do not output graduates that the industry can use; popularity with school leavers does not imply attractiveness to employers. There are a smaller number of undergraduate, masters and doctoral programmes that are well-structured and carefully-delivered; however, these are notably difficult and only the best will graduate.

In research terms the field of computer games continues to suffer from the lack of a clear academic focus. Computer Science has never cast off its umbilical attachment to Mathematics. Nor need it do so. But, computer games development is more than Software Engineering; it is everything potentially from Anthropology to Zoology. I dare anyone to pull out an established academic degree subject and say, "There is nothing of relevance here to computer games."

What a challenge.