Industry Engagement and Graduate Skills

A Report on Tertiary Courses in Interactive Media and Computer Games

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ISIS Project Partners

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The Report

This Report - Industry Engagement and Graduate Skills: A Report on Tertiary Courses in Interactive Media and Computer Games - was prepared by Ms Leonie Kirchmajer and Emeritus Professor Sue Rowley.
# Table of Contents

1. Report Summary
2. Key Findings and Recommendations
3. Introduction
4. Overview of Interactive Media and Gaming courses in Australia
5. Course Statistics
6. Course Admissions and Advanced Standing in 2010
7. Advanced Standing and Credit transfer arrangements
8. Advanced Standing Practices
9. Curriculum Design
10. Focus on Interactive media and/or gaming content within a course
11. Professional Learning and Experience
12. Graduate outcomes
13. Curriculum review and development
14. Documents and publications
15. Appendices
1  Report Summary

The Interactive Skills Integration Scheme (ISIS), funded by the Commonwealth Workforce Innovation Program and the Victorian Government, is a two-year industry development project targeting the computer games and interactive media industry. Commencing in 2010, the ISIS project responded proactively to industry and government concerns that educational courses were not adequately equipping graduates for future employment opportunities and industry needs.¹

The Interactive Skills Integration Scheme (ISIS) focused workforce skills and business sustainability with the aim of improved preparation for professional practice in undergraduate education programs, leading to ‘work-ready’ graduates in interactive media, and improved management/business model skills of leading industry practitioners. ISIS aimed to identify and pilot interventions to:

- improve the education of graduates to better equip them for careers in this industry;
- develop more sustainable career pathways for existing games and interactive media practitioners;
- pilot interactive media applications, services and technologies in cross-sector markets; and
- improve the upper management skills of industry organisations.

ISIS proposed to develop, trial and showcase strategies to extend applications of interactive media beyond the games sector to the broader interactive media and other industries. ISIS sought to address unmet workforce and skills demands of the Australian games industry that will allow it to take full advantage of new market opportunities created through a broader application of interactive media to other industry and public sectors.

Recent studies, including Working in Australia’s Digital Games Industry Consolidation Report² by Dr Sandra Haukka in May 2011 and NCVER’s Monograph Series 6/2011³, have presented an industry perspective on interactive media and gaming education and training. Haukka concludes that ‘Australia’s games industry continues to experience serious skills issues’. In polls taken for this study, 83% of respondents believed that skills shortages existed and 84% indicated that games courses in Australia were highly ineffective’ (pp. 47, 52-53). Issues identified by industry respondents included:

- insufficient/ineffective linkages between industry and providers;
- rapid pace of change means workers need access to ongoing education and training;
- mismatch of graduate skills and industry needs;
- lack of local experience and skills resulting in expensive and time-consuming overseas recruitment;
- critical importance of certain non-technical skills;
- teachers with insufficient industry experience; and
- shortages of structured on-the-job training opportunities.

NCVER research drew similar conclusions, with industry respondents believing that ‘a large proportion [of many games-specific courses at VET and university levels] are simply rebranded programming or arts courses with a couple of games units added. Their graduates are unlikely to be employed by games companies because, as a games company manager said, "they get taught the wrong tools, the wrong techniques, and don’t understand how the games industry works".’⁴

¹ for more information, see: http://www.isisinteractive.net.au/
The NCVER report also noted that '[some] registered training organisations and universities provide dedicated games courses in close cooperation with industry, which means that their graduates have skills in using the relevant current tools and technologies, and thus find it easier to get jobs'.

This ISIS review of tertiary education courses in games and interactive media sought to elicit 'the other side' views and experience of educators and providers. The study is an extensive review of tertiary educational and training offerings in computer games and interactive media throughout Australia. Information on Vocational Education and Training (VET) diploma courses and University undergraduate courses and curricula was obtained from surveys of course providers (lecturers, teachers and administrators).

In the light of expressed industry concern about lack of consultation between course providers and industry, a key focus of this ISIS study was consultation and industry input into courses. Additionally, the IBSA 2009 Review of the Digital Games Development Game Art, Animation and Programming indicated that the industry itself is often not aware of what education and training is available, finding that “[t]here was low awareness of the range of national courses and competencies available in their region.”

This study, too, finds gaps in communication between industry, the profession and educators. Thus, an immediate challenge for both educators and industry leaders is to develop effective voices for teachers, students, graduates, employers and employees in the Australian interactive media and games industry. Greater communication between educators and industry would increase both industry awareness of the education and training currently available and educator awareness of the skills and knowledge required by industry.

The study showed significant variability in the frequency and methods used by course providers to engage with industry as part of the curriculum review and development process. If providers are not engaging with the industry frequently or are only consulting a very narrow portion of the industry, then they risk not keeping up to date with industry requirements. The ISIS study has revealed a significant increase in the number of these courses on offer. The situation could emerge in which there is both an excess of graduates and a skills shortage.

Initially, a comprehensive list of all courses offered by universities, TAFE and other VET providers was compiled from information provided online. Using this database, key personnel (such as Deans, Heads of School, course coordinators and administrators) were identified and contacted. In three stages, they were invited to complete surveys that covered basic course information, articulation between VET and university courses, career and employment preparation, course reviews and industry consultation.

This ISIS Report presents the findings of the research undertaken and outlines the current state of the interactive media and gaming education in Australia. Recommendations are made for curriculum development, improving industry engagement and input, and further investigation.

**Course statistics: courses, student enrolments and graduates**

In 2010, a web-based search revealed that there are 166 courses in interactive media and related areas offered by 56 course providers\(^6\). More than half of these courses are undergraduate Bachelor degree courses offered by Universities. These courses include both specialist courses in computer games and broader courses in Computer Science/Information Technology and Creative Arts/Industries that include a major or specialisation in computer games, interactive media or related areas. The majority of course offerings are generalist Creative Industries/Arts programs. The majority of courses are concentrated in Victoria, Queensland and NSW.

\(^6\) Based on the ISIS review of courses offered in 2010.
The first survey was sent to all identified providers in March-May 2011: a total of 56 surveys were sent out; 17 were completed and returned to ISIS, representing a response rate of 30.1%. The information provided by these 17 respondents covered 56 courses (representing 33.7% of total courses).

Since 2005, the number of students enrolled in these courses has more than doubled (increase of 108%) from 2157 enrolments in 2005 to 4479 enrolments in 2010. Whilst university enrolments increased by 61% from 2092 to 3375, the steep rise is explained by the entry of the VET sector providers into this market. VET enrolments increased from just 65 in 2005 to 1104 in 2010, an increase of 1598%.

The number of courses on offer has almost tripled - an increase of 186% since 2005. This growth in courses is a key factor in the growth of overall enrolments, especially considering that individual course enrolments appear to be fairly stable\(^5\). There has been a corresponding increase in the number of graduates, although many of the new courses have yet to produce their first graduates. If the trend of increased enrolments and completions continues, there may be approximately 4700 graduates from these courses over the next 1-3 years\(^6\).

*The growth in course offerings appears to be based on prospective student demand for courses and may not reflect industry demand for graduates. Considering the size of the Australian games and interactive media industry sector, proliferation of courses and increased enrolments may result in more graduates seeking employment than the industry can absorb.*

**Articulation and advanced standing between VET and Higher Education courses**

There has been a significant growth over the five-year period 2005-2010 in the number of VET courses offered by TAFEs and Private Providers. The second survey sought information on student movement between the VET and Higher Education sector and articulation arrangements between VET providers and universities. In general, this information appears not to be collected at institutional levels by providers so the survey sought information from course conveners, who would have been responsible for recommending admission and any credit transfer or advanced standing, and admissions administrators. The relatively low response rate means that inferences drawn from the responses should be treated as indicative.

The research investigated formal and informal pathways of articulation or credit transfer between providers and found little evidence of any significant levels of student movement between providers. VET graduates were admitted to university courses in just under a half (48%) of the courses covered by survey responses, suggesting a willingness to accept VET qualifications by universities and offer credit transfer or advanced standing on a case-by-case basis. But, in these courses, VET graduates represent less than 10% of the student intake. Very few students in 2010 received any advanced standing or credit towards their course from prior study, and those who did only received a small amount of credit.

Where movement does occur, students are more likely to move from VET to Higher Education than the other way around. Only a few students appear to enter VET courses having already completed a higher education course. Thus, at present, there appears to be little incentive for providers to create and promote advanced standing or articulation options for these courses.

The third survey was administered concurrently with the second survey (two instruments were used because, in many institutions, advanced standing and articulation is handled by centrally-located admissions administration section whereas course design and student experience is handled by faculty-based academic staff). Surveys were sent to 186 course coordinators (or equivalent) resulting in 64 responses, a return rate of 34.4%.

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\(^5\) Enrolment figures based on the data received from providers via ISIS Survey 1

\(^6\) Based on a completion rate of 42% calculated on the data received from providers via ISIS Survey 1 and applied to the known and extrapolated (based on average) enrolments for 2008-2010.
Curriculum structure and design
Several key features of the curriculum design of these courses were examined, including the mode of course delivery, the proportion of the course dedicated to specific interactive media and/or gaming content, and the way professional learning is embedded into the course.

These courses are predominantly full-time courses, with over 80% being offered on either an exclusively full-time or mostly full-time basis. While this may not be a significant issue for students undertaking their first qualification after high school, it does make it difficult for students already in the workforce to undertake courses to extend or specialise their existing skills and improve employment prospects.

The survey asked respondents about the proportion of specific interactive media and/or gaming content in the courses. In just over half the courses, course content specifically on interactive media or gaming amounted under 50% of the total content. Specialist courses were more likely to have a higher proportion of specific interactive media and/or gaming content. However, overall, the course type – being a specialist course or a more generalist course with a major – is not an indicator of the amount of specific interactive media and/or gaming content in a course. Even those courses that are Nationally Recognised Training (NRT) programs were highly variable when it came to specific interactive media and/or gaming content. Notably, the Diplomas of Interactive Digital Media, which were the only specialist NRT program included, ranged widely from 11% to 90% of specific interactive media and/or gaming content. It should be noted that new NRT programs have since been developed with a more focused curriculum that should address some of the issues of high variance in the previous program.

Thus, the proportion of interactive media and/or gaming content within courses varies but the course descriptors (name, type of course etc.) do not adequately or consistently provide information about actual course content and focus. This may make it difficult for both prospective students and employers to gauge whether the course would cover the desired skills and knowledge for a career in interactive media and/or gaming.

Professional learning, experience and career preparation
Courses that aim to prepare students for professional careers may offer or prescribe one or more kinds of professional preparation, such as Professional Practice subjects/units, industry placements and internships, and ‘real-world’ client-driven projects. Based on survey responses, it appears that such professional experience and education opportunities feature in almost 90% of courses. However, in around 60% of courses, professional experience is optional or elective rather than required for course completion. The most frequently reported forms of professional experience are Industry Placements and Industry Projects. Where Industry Placements are available, they are usually limited or restricted in places, which may reflect a difficulty in finding suitable businesses for student placements.

The majority of courses include Professional Practice subjects, and a significant proportion of these specifically focus on the interactive media and gaming industry. Few business and/or legal studies subjects are offered as part of professional learning. VET courses are more likely to include a higher proportion of Professional Practice subjects, while university courses are more likely to include Industry Placements.

Professional learning and experience is arguably a key factor in employment success and the majority of courses do offer Professional Practice subjects and/or industry placements in the curriculum.

Graduate outcomes
Graduate outcome information (in the form of employment data and graduate feedback) is notoriously difficult to secure generally, and this is also true for games and interactive media graduate outcomes. The majority of respondents do not have actual graduate employment data (and a third of responses had received no graduate feedback on their course),
Nevertheless, around 75% of respondents thought that under 50% of their graduates were employed in the interactive media and/or gaming industry. When asked what students can realistically expect from completing their course, the majority of providers agreed with the statement that “they would be qualified to gain employment in the interactive media and gaming industry, but should be aware that jobs in Australia are limited and highly competitive”.

Common themes from the student feedback that respondents had received include: the industry is very competitive and difficult to enter; a need to be persistent with applying of jobs and be willing to relocate; realities of working in the industry do not meet expectations; and graduates need to do more than just what is in their course in order to be employable with some deciding to undertake further study to improve their prospects.

_The overwhelming majority of respondents have no actual graduate employment data. Whilst most think their graduates are well qualified to gain employment in the industry, their anecdotal impression is that under 50% of their graduates are employed in the industry. Where it is available, graduate feedback indicates how difficult the industry is to enter and that it has not met graduate expectations of what working in the industry would be like. This indicates a significant expectations gap may exist between course providers, students/graduates, and industry._

**Industry engagement in course review processes**

One of the primary methods for ensuring the quality and relevance of the curriculum is through the institution’s formal process of course review and development. The majority of course providers have some form of curriculum review policy to establish the frequency and process of reviews and curriculum development. Survey responses suggest that courses reviews vary in both frequency and the requirement of external input from industry and relevant professions. The Private Provider respondents consistently report annual curriculum reviews, with both internal and external input. The majority of Universities (including dual sector institutions) report that they conduct external curriculum reviews only every 5 years. Formal review processes in universities tend to be major undertakings with reports, recommendations and implementation programs considered not only by Faculties but also by university-level bodies such as Academic Boards and Senates. Nevertheless, the games and media industries are changing so quickly that, unless other on-going revision and improvement processes in place, 5-yearly reviews could put courses at risk of being out of touch with current practices.

While most external curriculum reviews require some kind of input from industry, the way this is elicited is variable. The most commonly reported forms of industry engagement are the inclusion of interactive media and/or gaming professionals on curriculum review committees and consultation with interactive media/gaming companies and associations. Of the 21 different companies that were consulted for curriculum review in 2010, at least 3 have since closed, including Team Bondi, the most frequently mentioned company in the responses. Significantly, those providers that reviewed courses more frequently were also more likely to use a range of different methods to engage with industry, which may indicate an overall higher level of ongoing engagement with industry.

_It appears that providers may not be engaging with industry on formal curriculum reviews frequently enough to keep pace with changes. If the current trend of Australian interactive media and gaming company closures continues, it may become difficult for course providers to connect with local businesses and obtain key industry input. There is potential for industry associations to provide a more active role in representing the industry in curriculum development._

While there has been research on the industry and now course providers as separate groups, the key issue remains how to bring the two together to increase industry awareness of what education and training is available and to increase education provider awareness of what skills and knowledge the industry needs.
The connection between industry and course providers should also inform interactive media curriculum development to ensure that courses offered are relevant and sustainable to counter the current situation of a saturation of courses, excess of graduates, yet still a skills shortage. Some form of consistent guidelines for interactive media curriculum or endorsement of an industry body could assist both prospective students and employers in differentiating the myriad of courses on offer may also be useful.

Regular engagement with the industry and graduate feedback could contribute to the curriculum and inform future developments by providing an external perspective.

Overview
Overall the ISIS Education Research highlights:

- significant growth in courses offered and overall enrolments;
- potential oversupply of graduates in coming years;
- little provision for, and use of, advanced standing or articulation between courses;
- significant variability in specific interactive media and/or gaming content within each course;
- high presence of a range of professional experience and professional learning options focused on interactive media/gaming;
- variability in the frequency and method of industry engagement in formal curriculum reviews;
- need for more information about graduate outcomes; and
- graduates are experiencing difficulty entering and working in the industry.

Recommendations and next steps
The key findings and recommendations presented in the next section are, for the most part, addressed to course providers. They could form the groundwork, or agenda, for effective consultation between educators and industry.
2 Key Findings and Recommendations

A summary of key findings is presented below.

Course enrolments and completions

- Total course enrolments in the sector have increased by 75% from 2005 to 2010, with significant growth in VET courses from TAFE & Private Providers.
- The rise in total enrolments is primarily due to an increase in the number of courses on offer by 150% from 2005 to 2010.
- The average of course enrolments has declined by 30% from 2005 to 2010 showing the growing number of students being distributed over a wider range of courses.
- Total course completions in the sector have increased by 87% from 2005 to 2009, however many of the new courses on offer have yet to produce graduates.
- The average course completion rate, based on 2009 completions, is estimated to be 42%. This rate applied to the 2010 enrolment figures would produce ~1460 graduates in the next couple of years, from just from 30% of course providers in the sector.
- If the completion trends from the surveys are considered indicative and applied to the sector on the whole, it would imply ~4800 graduates entering the industry over the next 1-3 years, with obvious implications for employment.

Recommendations

1. that course providers note that the proliferation of courses largely accounts for growth in student enrolments and projected increase in the number of graduates; and that employment opportunities for their graduates may be very restricted; and
2. that, in proposing new courses in gaming and interactive media, course providers give serious consideration to employment and career opportunities of graduates.

Student demographics

- Women make up just on one third of total student enrolments; the average gender ratio in courses is 32.8% female: 67.2% male.
- The gender ratio difference is more pronounced in the TAFE and Private Providers (26.3% female: 73.7% male).
- Female students are in a majority in only 22% of courses.
- The spread of ages across courses is as expected for entry-level courses, with 80% of students aged 25 or under; 16-21 year olds made up 51.8%, with the next largest group being 22-25 year olds (27.8%).
- The VET level courses have a more even distribution of age, and this could indicate that more students are entering these courses after other initial education or work.
- The majority of students are domestic students, with an average of 84.4% domestic student and 15.6% international students.
- The Bachelor degree courses show more international students (18.83%) than the VET level courses (9%).
- 27% of courses have no international students.

Recommendations

3. that course providers note that women make up just on one third of total student enrolments and introduce programs and initiatives to encourage female students to study gaming and interactive media courses;
4. that course providers note that courses attract predominantly younger students of 25 years or under and consider whether there are opportunities to attract older students, including those already in the workforce, to study gaming and interactive media courses; and

5. that course providers note that only 16% of students in the courses are international students and consider whether there are opportunities to attract international students to study gaming and interactive media courses in Australian institutions.

Articulation and Advanced Standing practices

- The main basis for admission into both the VET and Higher Education courses is Senior Secondary Education (i.e. Recent School Leavers), followed by a VET qualification.
- The majority of students reported for 2010 did not receive any advanced standing or credit towards their course. Where credit was granted in a course, it was to 10% or less of the enrolled student cohort.
- The perception of the majority of course coordinators was also that under 10% of students in their course receive advanced standing.
- Where credit was granted, up to half a year of study was granted towards Bachelor degrees, and approximately 1-2 subjects or units were granted towards Advanced Diplomas and Diplomas.
- The basis for credit being granted showed an emphasis on both VET providers and VET level courses as the main sources of credit.
- Just under half of the providers had formal credit arrangements. Universities were more likely to have formal credit arrangements for commencing students while TAFEs and Private Providers were more likely to have formal credit arrangements for their graduates going on to other courses. This seems to reinforce the observation that the direction of student movement is from VET to Higher Education.
- The main reason for not having formal credit arrangements is that providers prefer to manage credit applications on a case-by-case basis.
- The responses also indicated that around half the providers, predominantly Universities, processed credit applications from international students differently to domestic students.
- Most university course coordinators believed their graduates were likely to go on to further study in Higher Education.
- Just over half the providers agreed that the presence of Advanced Standing arrangements did influence prospective students in selecting courses, and this was true for both students seeking a pathway into future courses and students who have already completed a course.

Recommendations

6. that course providers across VET and universities note that few students appear to ask for, or receive, advanced standing or credit towards courses when they transition across levels of awards (particularly VET diploma to university undergraduate degrees); and note that arrangements usually are made on a case-by-case basis; and

7. that course providers across VET and universities work co-operatively to develop and promote improved articulation pathways to benefit students, industry and course providers.

Curriculum structure

- 83.9% of courses are offered on either an exclusively full-time or mostly full-time basis.
- With the exception of Australian Skills Quality Authority (ASQA) accredited VET courses, most courses had no external accreditation.
- The majority of all respondents reported that specific interactive media and/or gaming content made up 31-40% of total course content.
- The responses show that course type (specialist or general) is not a clear indicator of the proportion of specific interactive media and/or gaming content in a course.
• Results also showed that Nationally Recognised Training (NRT) programs were highly variable when it came to specific interactive media and/or gaming content, with even the Diploma of Interactive Media ranging from 11-20% to 81-90% of specific interactive media and/or gaming content.
Recommendations
8. that course providers across VET and universities investigate the market for part-time enrolments in their courses to cater for practitioners already working in the interactive media/gaming industry sector and/or those who seek to undertake education in order to work in this sector;
9. that, in their course descriptions and marketing materials, course providers give accurate information about proportion of specific interactive media and/or gaming content in the course.

Professional learning and experience
• Almost 90% of courses offer some form of professional experience. The majority of these options (61.9%) were electives.
• The most frequently used forms of professional experience were Industry Placements and Industry Projects.
• The longer courses, such as Bachelor degrees, were more likely to include an Industry Placement option within the course.
• The majority of respondents reported that Professional Practice subjects or units were part of their course, and a significant proportion of these subjects were focused specifically on the interactive media and gaming industry.
• There were fewer business and legal studies units reported as part of professional learning.

Recommendations
10. that course providers collaborate with professional practitioners in the interactive media/gaming industry sector to ensure that students in the courses have opportunities, and are encouraged, to undertake work placements; and
11. that course providers review the content of their Professional Practice subjects and units to ensure that they provide material focused specifically on the interactive media/gaming industry sector and its workforce profile and opportunities; and material relating to business practice and legal frameworks relevant to business success in this sector.

Graduate outcomes
• The majority of respondents did not have actual graduate employment data.
• Around 75% of respondents thought that under 50% of their graduates are employed in the interactive media and/or gaming industry.
• A third of responses had received no graduate feedback on their course, while Private Providers and TAFES were more likely to have received feedback than Universities.
• Where feedback was available, common themes include: the industry is very competitive and difficult to enter; a need to be persistent with applying of jobs and be willing to relocate; realities of working in the industry do not meet expectations; and graduates need to do more than just what is in their course in order to be employable with some going on to further study to improve their prospects.
• When asked what students can realistically expect from completing their course, the majority of respondents said that their graduates would be qualified to gain employment in the interactive media and gaming industry, but should be aware that jobs in Australia are limited and highly competitive.

Recommendations
12. that course providers continue to make best efforts to elicit information on graduate employment outcomes and the graduate experience of seeking and entering employment;
13. that course providers collaborate with interactive media/gaming professionals to ensure that students are well-informed about the industry and are able to form realistic expectations about employment opportunities and the workforce entry skills that employers are seeking; and
14. that course providers, government, professionals and companies collaborate to extend graduate employment opportunities in interactive media services, applications and technologies for broader uptake in such industry and public sectors as health, education, manufacturing, mining, defence, etc.

Curriculum review and engagement with industry

- Private providers consistently reported that they conducted annual curriculum reviews, incorporating both internal and external input.
- The majority of Universities (inc. dual sector) reported that they conducted external curriculum reviews only every 5 years. Unless they have other curriculum improvement processes in place, in an industry that can change so quickly, this could put them at risk of having courses that may be out of touch with the current practices.
- Those who reviewed courses more frequently are more likely to use a range of different methods of industry engagement.
- The Specialist courses reported the highest number of different forms of industry engagement.
- The most common forms of industry engagement were the inclusion of an interactive media and/or gaming professional on a review committee, as well as consultation with interactive media/gaming companies and associations.
- Of the 21 different companies listed as having been consulted on curriculum review, at least 3 have since closed, including Team Bondi, the most frequently mentioned company in the responses.

Recommendations

15. that course providers ensure that their course curriculum keeps pace with changes in the industry and factors in external economic environment that impact on employment and work opportunities in interactive media and gaming - this may require universities to review courses formally on a more frequent basis;
16. that course providers and industry ensure that their effective engagement and co-operation is a key element of continual improvement in courses and student exposure to, and opportunities for, professional experience;
17. that effective co-operation is in place for course reviews and on-going improvement between course providers and relevant industry peak bodies, in particular the games developers' associations.