

## **Evaluating teaching materials and educational software for their commercial potential: Issues for academics and teachers to consider**

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### **Abstract**

The commercial potential of newly developed teaching materials and educational software is a frequent undercurrent in discussions of modern education. While commercialisation of teaching materials does not necessarily require computer systems, in practice the vast majority of current interest has been provoked by recent developments in computing, and more particularly, the rise of the Internet. This paper reviews some of the major issues that teachers and academics face when considering the commercialisation of educational materials, and presents a framework to assist in the evaluation of potential commercial products and services for the modern educational world. From an educational developer's perspective (academic or teacher), relevant issues include: the ownership of educational materials (intellectual property), the relationship between educational developers and their employers, the role of copyright and patents, and the positive and negative aspects of collaboration. The importance of business planning in the early stages of evaluating the commercial potential of educational materials is emphasised, as is the importance of partnerships with other appropriate organisations. An evaluation of the current commercial opportunities for educational materials is framed within an understanding of current directions in national and global education.

### **Introduction**

Evaluation is now widely recognised as a critical component of the development of new educational materials and technologies (Alexander, McKenzie and Geissinger, 1998). This may include formative evaluations during the development process (where students, colleagues and/or professional bodies may be consulted) as well as summative evaluations to examine the effectiveness of new systems following their formal use in educational programs. Despite the fact that Alexander and her colleagues (1998) have indicated that many recent government-funded projects in Australia have been unable to clearly demonstrate how the projects evaluated their effectiveness, evaluation is clearly an important dimension of ensuring the academic quality of new educational materials and technologies. The past year has seen a number of important new initiatives in this area in Australia, such as the CUTSD funded ASCILITE evaluation project

(Phillips, 1999).

However, an often overlooked element of evaluation of educational materials and technologies is that of commercial potential, as distinct from academic merit. While commercial considerations are unavoidable at some level in most projects (given the costs of hardware, software, staff for programming and development, and legal expenses), many developers have failed to consider the wider commercial potential of their work within their initial planning. This is surprising given the increasingly difficult funding situation of universities and the high costs of many of these projects. The reason for the limited exploration of economic potential, at least in part, is due to the lack of experience of academics and teachers in the commercial (as opposed to academic) considerations involved in educational development.

The purpose of this paper is to provide a preliminary introduction to some of the issues involved in these kinds of commercial considerations. The suggestions presented here are made from the perspective of an academic who has been involved in an education commercialisation process over the past three years which has involved broad-ranging considerations of business planning, legal issues, intellectual property rights and alliances with corporate partners. While a commercial approach is anathema to some academics, it is suggested that economic issues will become increasingly important over the next few years until a point will be reached where no substantial investment in educational technology development will be possible without addressing these concerns. If this prediction is correct, then academics and teachers with an ongoing interest in this field will need to learn new skills and develop an understanding of the peculiar requirements of evaluation from a commercial perspective.

## **Education and commercialisation: the context**

Many developers of learning materials and educational software (both academics and teachers) have to be at least partially aware of the potential commercial value of their endeavours, even in the absence of an articulated commercialisation plan prepared by their institution or its affiliates. Informal discussions between educational developers at information technology education conferences have increasingly included commercial as well as academic considerations of newly developed learning materials. In the past year, a number of education conferences in Australia have acquired corporate sponsorship from 'new education providers' seeking to collaborate with educational developers who have often worked for many years with little recognition from their own institutions or external corporations. As Katz (1999), Duderstadt (1999), and others have argued, this is part of a revolution occurring within education resulting from the confluence of 'for profit' education with the possibilities for 'anytime anyplace' learning provided by the Internet. While the influence of market forces on the traditional business of education would have arisen without the assistance of the Internet, the combination of these forces for the future of

education is explosive.

In terms of the wider context, funding of education in Australia and elsewhere has been shifting from a reliance on government support to an increasingly 'user pays' based approach. While there are good reasons to believe that this shift will have certain detrimental effects on education and society as a whole, there is now little expectation that this trend can be substantially reversed in the near future. In addition to changes in public policy, private investors have recently begun to look to education as a major area of investment, with research groups such as International Data Corporation indicating that on-line education spending will reach almost \$800 Million by 2002 in Australia alone (IDC, 1998). Regardless of whether academics and teachers want large scale private investment entering their domain, external analysts are increasingly recommending it to savvy investors, such as a recent Banc of America Securities report which states 'the landscape of learning has never looked more promising for companies in the business of education' (Block and Dobell, 1999).

In addition, the nature of decision making within educational institutions appears to be moving from a collegial to a managerial approach. This has been driven not just by economic factors such as reduced public funding, but also by developments in management practice and theory within large corporations. Universities are now recognised by society as large businesses with yearly budgets often in the hundreds of millions of dollars and as a result, greater accountability is being required of universities by the community and government. This view of universities as large businesses is influencing traditional institutional decision-making processes.

Within all of these developments, individual academics and teachers are being increasingly asked to make judgements which involve considerations beyond simply the academic merit of a course or technology. In evaluating educational materials and software, they may now be expected to have skills in areas such as market research, project management, intellectual property and the development of business plans. Indeed, many of the unsuccessful projects discussed in Alexander et al.'s (1998) review failed due to problems in these areas.

There are different approaches to these issues depending on whether one looks from the point of view of an external education corporation, a university or school, or from the viewpoint of individual developers. Given that many educational developers have already, or will in the near future, become involved in commercially driven projects (either through their own developments or through collaboration with or secondment to other projects), it is appropriate to review some of the issues that arise from the individual perspective. These are examined below under the two major headings of 'Intellectual property' and 'Business planning'.

## Intellectual property

Few academics or teachers are clear on how to evaluate their rights in relation to any intellectual property they may develop in the sphere of educational materials and software. There are many reasons for this, but one of the more important problems is the sheer variety and lack of clarity in institutional policies concerning the status of educational materials and software, particularly when this relates to web-based materials (Bale, 1999). While some institutions argue that any work created within the course of employment (or in the US, 'work made for hire', see Burk, 1997) is owned by the institution, many others are less clear on this topic, while some have more sophisticated arrangements acknowledging different kinds of work ('typical' work versus work beyond the 'normal call of duty'), and different opportunities for commercialisation. There is good reason to believe that in the near future, policies regarding the ownership and usage rights of educational materials will become an important distinguishing factor between universities, with staff drawn to those institutions where, all things being equal, the intellectual property developed by staff is treated with respect and clarity.

Developers need to have a clear understanding of the policies that relate to their particular local context, and they should seek clarification of uncertainty at the beginning of the development process. It is much more difficult to solve intellectual property problems towards the end of a project due to the ambiguity and differing points of view that tend to arise when these issues are not addressed from the start.

Some of the difficulties of the current situation arise from the fact that what was once an idea or oral presentation has now become a fixed digital product which may then be subject to copyright. For example, when the famous Sydney philosopher John Anderson extemporised during lectures earlier this century, there may have been no copyrightable material arising from this activity (provided his oral presentation was not based on previously prepared physical notes, as was sometimes the case). In this example, despite the quality of the thoughts conveyed, the institution would not necessarily have had any intellectual property which might have raised the kinds of concerns addressed here. In contrast, the current use in education of word processors and the Web tends to create many digital products which, at least potentially, have value to both their creator and the institution as copyrightable intellectual property. Due to the technological changes of recent decades, it is only natural that universities may need to update and change their prior policies relating to the intellectual property created by staff.

While ownership is often a focal point for disagreement between individuals and institutions, there are a range of additional issues which deserve consideration, some of which can make ownership less problematic (Crews, 1999). These issues include reward, control, and usage rights. In terms of reward, an

educational developer may be willing to give up claims to ownership provided that some form of reward is provided. While financial reward is one obvious solution, other rewards of value to academics and teachers include recognition and promotion, and time release or support for other work which has been affected by involvement in an education project. Financial reward can take a number of forms, such as one-off payments, additional salary loadings paid for special projects, or various kinds of percentage rewards systems, such as royalties, equity in companies formed to commercialise a successful venture, or a combination of fixed and sliding percentages depending on ongoing work and/or commercial outcomes.

It is important to recognise that many universities have pre-existing policies for the commercialisation of research outcomes (typically via patents), and that sometimes these structures can be adapted to suit educational developments. However, this strategy is often problematic, as educational developments generally reside more within the intellectual property protection field of copyright rather than patents. The simple question of whether a CD-ROM is more like a textbook or an invention brings this issue into sharp relief (Thompson, 1999).

There are a number of different types of control issues which may arise in this area, such as whether a developer has the right to change materials in the future to keep them up-to-date or to amend errors. In some cases it may be appropriate for a developer to retain a right to refuse additions to earlier material, or to delete existing material where it becomes inappropriate. The issue of acknowledgment is also important, such that the original creators' names or institutions may not be removed regardless of any other subsequent modifications.

Control, as well as reward and ownership issues can potentially be solved via careful designation of 'usage rights' - a process Kenneth Crews refers to as the 'unbundling of rights' (Crews, 1999; Bale, 1999; CSU-SUNY-CUNY, 1997). Crews' model involves careful negotiation between all parties about specific rights to use developed materials. It typically starts from a basis that both individual developers and institutions have a variety of expectations of how materials may be used, and that many of these can be accommodated without conflict when they are articulated in specific rather than general terms (Crews, 1999). Where conflicts do arise, these can often be solved via specific usage rights involving locations and time periods.

For example, an academic who develops a course especially for distance learning and is paid additional income for this work may give up the right to be able to use this course material at another university for a specified period of years. However, after this period (say five years), the academic may be free to use the original material at another location if desired. If a university anticipates local competition in a particular course area, then restrictions can be based on the places (rather than the time period) in which material could be reused - for

example, the developed course could not be used within the same city or country. Another facet of the current example could be that the academic assigns exclusive usage rights to the university, but with a clause that allows the academic to write and have published a textbook on this subject as an exception to any other restrictions. The point of the 'unbundling of rights' approach is to avoid sweeping claims from either side, and to focus on specific, identifiable outcomes, and then to resolve these directly. While it is more complex than the simple 'the institution owns everything' approach, it can be a fairer recognition of often considerable creative investment of academics and teachers in their contributions to educational materials and courses. To be able to successfully negotiate these arrangements, developers need to be able to evaluate both commercial and academic aspects of their creations.

It is important that educational developers not lose sight of the 'bigger picture' when dealing with intellectual property issues. There is no point arguing about 'who owns what' if this results in material being shelved so that it never becomes widely used. Academics and teachers should recognise the many advantages of having the involvement of larger institutions (both educational and corporate) in the process of commercialisation. In many cases, developers will be unable to provide the necessary infrastructure (e.g. servers, Internet access, etc.) or ongoing support (e.g. help desk, backups, etc.) for developments unless they work together with their institution, which means that positive, fair and respectful negotiations are an important step towards a successful commercialisation. In some cases, institutions will have made considerable direct investment in the development of new materials and/or technologies (over and above 'typical' investment in development), and thus may have a reasonable case for sharing in any rewards. For an excellent overview of issues for consideration from both individual and institutional points of view, see The Node's 'The Rights Stuff: Ownership in the Digital Academy' (Bale, 1999).

## **Business planning**

While budgetary planning issues are not unfamiliar to many developers, the use of a full business case to justify educational technology projects is fairly uncommon among academics and teachers. It is unlikely that this will continue to be the case, as dwindling government investment and greater expectations of future returns will shift the focus from budget spending to income generation. As a result, business planning is likely to become a skill that many developers will need to demonstrate. Given the level of detail typically required for a full business plan, it is likely that institutions will develop 'gating' processes by which preliminary proposals are evaluated initially, and based on combined commercial and academic merit, these will be developed into full business proposals. An iterative approach to this process is to be highly recommended, as the precision involved in costing these projects becomes greater as a number of 'gates' of evaluation are applied.

Business plans have a range of common elements, and although these are rarely exactly the same across different fields, the following list is an example of the major headings needed for an educational project business case: executive summary, background, description of innovation/course, project/management team, market analysis, marketing plan, research and development plan (for technology developments), strategic alliances, project/business milestones, risk factors, financial modelling and appendices. Of these, some are relatively self-explanatory, but others may be unfamiliar to many academics and teachers, and hence deserve particular attention. These include market analysis, strategic alliances, risk factors and financial modelling.

Few current projects involve genuine market analysis prior to initiation. While market analysis should not influence the assessment of the academic merit of a project, it can be a significant commercial hurdle where a development is planned for a highly competitive or low financial return market. Market analysis can also reveal existing products which may abrogate the need for new development (the notorious 'not invented here' syndrome is unlikely to be defensible in the future). The point of including this topic within initial business planning is that some projects would not proceed as a result of the findings of this stage. Despite the academic merit of a proposed project, if it will not be commercially viable due to insufficient demand, then in most cases it would not proceed. In those special cases where a university believed that a development had intrinsic value despite its lack of potential to recoup project costs, then this consideration should be weighed carefully against any other financially viable projects which as a result might not be funded.

Strategic alliances is a useful consideration for large projects which are unlikely to recoup their costs from use within a single institution. Whether these alliances are with other universities, or with publishers or 'new education providers', they provide the potential for a wider dissemination of projects materials or technology through licencing. In many cases, alliance partners will bring additional benefits in marketing and distribution which may not be available to individual universities. Strategic alliances may also provide a basis for additional funding of project costs, or in-kind contributions which may offset other expenses (such as marketing).

Risk factors are a much overlooked area within current educational development projects. There are many kinds of risks that may affect a project, both external (new competitors) and internal (hardware, software and staffing problems). Too many current projects rely on a single person to drive development, which brings with it risks of illness, misadventure or problems if this person leaves the institution. There is already a recognition that better project management is needed (Alexander et al., 1998), and this may lead to less risks, or better responses to problems should they arise.

Finally, financial modelling is typically required of a business plan, so as to

show at what point a venture 'breaks even', and what possible returns may arise over the medium term. Few educational developments to date have adopted this approach, which may be one of the reasons for the lack of willingness of governments and institutions to continue to fund new developments in the face of a financial 'bottomless pit'. Like market analysis, financial modelling is important because it may result in a project not proceeding due to unsolvable revenue difficulties. An additional aspect of this process is 'sensitivity analysis', where the model is subjected to different initial conditions to observe the impact on later viability. For example, a new on-line masters course may hope to get 30 new students per year, and on this basis, make a small profit. Sensitivity analysis involves making different assumptions about the initial student intake (for example, 15 rather than 30 students per year), and examines the impact of this change on the final revenue model.

As can be appreciated from the detail required by the above material, the original developers of educational materials or technology may not wish to (or may not be able to) evaluate all the issues required for a business plan. In some ways this is understandable, as the skills needed for commercialisation are often different to those required for the original educational development. It is important for academics and teachers to understand that commercialisation typically involves collaboration with a wide range of partners who bring different skills to the development process. In liaising with others over commercialisation, it helps for the academics or teachers to have an understanding of the business planning process. At the same time, collaboration brings new strengths to the development team, but at the same time dilutes the significance of the original developer within any final commercial success.

## **National and global opportunities**

In conclusion, there are a range of current opportunities for newly developed educational materials and technology. The largest of these is arguably the provision of general educational software platforms to assist education, particularly over the Web. However, this is a highly competitive area, and several large companies (such as *WebCT* and *Blackboard.com*) have already gained a significant share of this market such that there is little room for new successful commercialisations in this field unless they radically alter the existing 'playing field' of course platform tools. A second category of opportunity is combined content and delivery platform products, such as CD-ROMs and hybrid web and CD-ROM/DVD packages which act as both content teacher and software navigation system. While there are still global opportunities for excellent products of this kind, they are generally very expensive to produce, and may struggle to be profitable in areas where other well developed packages already exist. Market analysis will be critical for this kind of development.

The broadest area of current opportunity is for on-line courses in the wide variety of topics currently taught 'face to face' within educational institutions. While in



many cases the possible returns from these on-line courses will not match those generated by general course platform tools or CD-ROMs, they do provide an area for commercialisation that is open to many current developers. Within this field, there are several ways of gaining positive financial returns from these developments. One is through an expansion of the existing student base of a course (provided that this leads to increased funding to the course providers), such as through access to overseas students. A second approach is to licence the content of the new courses to other educational institutions or to global publishers who have the reach needed to distribute materials to others who may wish to use them. A third (and in many areas very attractive) approach is to adapt course materials to suit adult and community education, continuing professional education or 'just-in-time' (JIT) training materials for corporations. While each of these approaches have various strengths and weaknesses, and may not be appropriate in certain content areas, they provide a framework for evaluating the potential commercial opportunities available to carefully planned and constructed educational materials and technologies.

In summary, this paper has argued that future evaluation of the development of educational materials and technologies will include not only academic considerations, but also commercial evaluation of business planning and the potential for financial return. Within this process, developers will be increasingly confronted with issues of intellectual property, and this paper has attempted to identify some of the important issues to be evaluated from the perspective of individual academics and teachers. In particular, the 'unbundling of rights' is proposed as one potential method of resolving difficulties in this area. The national and global opportunities for course delivery platform software, combined educational content and navigation software, and on-line course materials have been identified, with a particular focus given to on-line courses, and their potential to generate financial returns via an increased student base, licencing of materials, and repackaging of content for adult and community, professional and 'just-in-time' training. This approach assumes that the world of higher education will be radically altered over the next decade by the impact of 'for profit' education and the rise of the Internet in learning (Katz, 1999; Duderstadt, 1999). It will be interesting to see how individuals and institutions 'place their bets' on this assumption.

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