

The Financial Benefits of eLearning

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INTRODUCTION Technology is viewed in many sectors as an aid to productivity. Its ability to lower costs and increase output through automation, fast information processing, and improved communications makes it an important competitive tool. In education, technology (and more specifically, eLearning) is looked upon as a means for making teaching and learning potentially more interactive, effective, efficient, and accessible. In tertiary institutions, cost issues are of paramount importance to course creation and delivery. Indeed, financial analysis of education design and delivery is "central to the planning and development of education systems" (Rumble, 1997, p. 2).

While the productivity benefits of eLearning for corporate training are well known (see for example Rosenberg, 2001 and Rueda, n.d.), little work has been done on the financial benefits eLearning makes possible in the education sector (Rumble, 2001). According to Cukier (1997), most existing studies are more concerned with the cost-effectiveness of distance education as compared with face-to-face education, although exceptions do exist (Boeke, 2001).

In the main, institutions fund eLearning at the strategic level and tend to require little financial accountability beyond the setting of an annual budget. Eventually,

however, it is likely that tertiary institutions will be asking financial questions of their eLearning initiatives. While this may be desirable, a complicating issue for eLearning teams is the fact that eLearning projects have very high fixed costs and very low variable costs, meaning that the initial costs of development are extremely large and financial benefits can take time to accrue. Many costs of eLearning are also difficult to isolate from the overall course design and delivery costs. Adding to the complexity of tracking cost for many institutions is the need for diverse eLearning projects, ranging from course adaptation to the development of simulations and digital media. Each project is a unique mix of scope and cost.

This paper draws on approaches taken by corporate trainers when costing eLearning initiatives, and explores ways in which eLearning departments within tertiary education institutions (TEIs) can proactively and transparently account for their activities.

TEI VERSUS CORPORATE

ELEARNING Corporate training eLearning budgets tend to be substantially larger than those of typical TEIs because of the substantial savings that result, particularly in the areas of travel, less disruption to productivity, and flexible scalability (Rosenberg, 2001). Of

particular interest to commercial trainers is the “time to competency” (Rueda, n.d.), the time it takes for a trainee to become proficient at their job, which is significantly reduced when eLearning is applied in place of traditional workshops. TEIs are only able to benefit from these same advantages if they are able to use technology to offer self-paced training packages designed to teach skills, although this can be at odds in tertiary contexts that have cognitive development as a prerogative. Rosenberg puts this well:

In business, learning is a means to an end. Generally speaking, that end is enhanced workforce performance, which in turn reflects its value—better products and services, lower costs, a more competitive posture in the marketplace, greater innovation, improved productivity, increased market share, etc. (2001, p. 4)

Financial considerations are still important for TEIs. However, the relative worth of eLearning expenditure can be harder to quantify than it is for commercial trainers.

eLearning can be justified based on its contribution to the four major criteria for business performance identified by Hammer and Champy (as cited in Rosenberg, 2001): cost, quality, service, and speed. The same criteria can be applied for justifying eLearning investment by TEIs.

- **Cost:** The relationship between financial investment and financial return, the focus of cost-benefit analysis (CBA) and return on investment (ROI).
- **Quality:** Better meeting and exceeding client expectations. Improved

quality can lead to an enhanced reputation, with the further benefits of increased client loyalty and market share growth.

- **Service:** eLearning can lead to better responses to customer needs and improve satisfaction. This can lead to better differentiation in the marketplace and improve access for clients, leading to higher enrolments by part-time clients in particular.
- **Speed:** eLearning makes communications and information updating possible in real-time and, particularly with asynchronous communications, enables flexible learning.

Not all are easy to quantify for education providers; however, all affect the long-term financial performance of an institution.

WHAT DOES ELEARNING COST?

Costs of development, delivery, and associated overheads should be considered when evaluating eLearning costs (Rumble, 2001). In spite of these clear categories, however, budgeting and controlling eLearning expenditure is made extremely difficult. Little is known about the specific financial dynamics of eLearning, although general principles are emerging, such as these from Boeke (2001, p. v):

- Technology-mediated delivery is more expensive than face-to-face delivery.
- Communications costs and course design are the major costs that make technology-mediated delivery so expensive.
- Institutions that are not experiencing high costs in communications or course design are probably not leveraging the technology well.

- Planning costs substantially reduce development costs.
- Mentoring and other support functions do affect course completion rates.
- People costs are generally the most significant costs for eLearning design and delivery.

Further, information transferability of financial data in literature is complicated by a general lack of reporting in the following areas:

- **The actual scope of the recorded costs.** For example, in the creation of a website, does the cost of development include the writing and proofing of the editorial content, or does it solely consider the development of the Web interface? Does the cost include the scoping or evaluation of the product?
- **The mix and management of personnel,** and their respective skills and experience at eLearning design.
- **The learning process required of students from the resource.** One student hour, for example, might involve reading a specially written topic summary or completing step-by-step tasks, both of which will cost different amounts to develop. Other resources may point the student to external websites, while others may require the preparation of fully interactive simulations.
- **The level of the course being prepared.**
- **The level of overhead,** which differs from institution to institution. Some costs may ignore overheads altogether.
- **The actual quality or level of professional input into the finished product.** For example, the footage taken for digital video might be of cinematic quality, home-video quality, or any point in between the two.

- **The amount and state of pre-existing material used in the design.**

TEIs are best to create their own cost system if they desire reliable estimates for forecasting purposes. One of the benefits of tracking the internal cost of eLearning is that it enables the formulation of an hourly rate that can be used to budget projects. Of course, such a figure should be designed to reflect costs adequately rather than accurately, as costing is an area that can cause "paralysis by analysis." There is a very real trade-off between what works and what is perfect in terms of budgeting and forecasting.

The advantage of internal costing is that it allows for better comparison between internal real costs of production and the costs of outsourcing. Considering overheads in the hourly rate permits a truer view of the actual cost of eLearning development than does consideration of only direct costs, as the latter may make eLearning development appear to be cheaper than what it truly is.

A Project Management Approach

A project management approach to eLearning design is likely to help in the allocation of limited resources and accountability. Each project follows a formalised design process, which is carefully managed and justified. Ideally, the justification for each individual project should be described in terms of:

1. The student learning/access needs it will help to meet.
2. The advantages of the eLearning solution over the status quo.
3. The raw materials and resources already in place that can be used in the eLearning solution.

4. The potential financial value of the project (cost/benefit).
5. An itemised budget that includes an allowance for unforeseen costs and rework, and projected ROI (return on investment) or CBA (cost-benefit analysis).
6. An overview of what is already available for purchase or license, including strengths and weaknesses and costs.

Even if the project is not likely to make a positive financial return, the reality should be acknowledged before the money is committed. Larger projects might be broken into independent phases. A project may be the development of an entire course or the creation of an eLearning element within an existing course. The nature of eLearning projects is as diverse as eLearning itself.

Projects with a broad application are able to justify higher levels of investment. Joint ventures or partnerships with other institutions might be considered at the justification stage if the numbers do not add up within a comfortable margin.

Determining Value with CBA and ROI

The attractiveness of an eLearning project should be determined at least in part by the undertaking of a projected ROI and CBA. Both have always been major considerations for commercial training projects, although it is important that they be used for planning and not as a measure of success, because with both it is possible to manipulate the result by reducing the level of investment and compromising on design. ROI and CBA should be treated with some caution.

The ROI is usually determined after an intervention has been implemented. ROI is the profit or surplus resulting from the intervention (benefit less cost) divided by the amount invested to make the intervention possible (cost). It can be used to compare the return of one intervention with that of another. An ROI of 0.125 would indicate that every \$1 invested into a project resulted in a surplus of 12.5 cents.

The CBA divides the estimated benefit of the intervention by the cost of design, development, implementation, and evaluation. An intervention that results in a return of \$125 and cost \$100 to make has a CBA figure of 1.25. The ROI on that project would be 0.25. As can be seen, both figures are very similar; which one is used is largely a matter of preference. Either can be calculated before a project is started to help justify expenditure and both rely on financial measurements for cost and benefit.

COSTS All money invested into a project contributes to the costs of that project. Costs include both direct (real) and indirect (associated) expenditure. For example, an employee would be a direct or real cost; the electricity they consume, the wear and tear on the computer equipment, and the cost of the software they use during the project would be indirect costs. Indirect costs are also commonly known as overhead costs.

Overhead costs should be based on the total budgeted department expenditure during the year for overhead expenses, divided by the number of hours that can be used for production. The result can be used to set an internal hourly rate for projects that can be used as the basis

for internal charges or else as a basis for departmental accounting. Overhead costs tend to be higher than actual costs of production and development, and so it is best to show the actual overhead as a separate figure rather than bundling it to an hourly rate. Overhead could thus be represented as a multiplier based on the direct costs of development. Explicitly confronting overhead costs in such a way adds incentive to see them reduced and controlled. Rumble (1997, p. 62) describes overheads as "burdens that need to be decreased" (emphasis original).

There are many ways in which costs can be categorised (see for example

Bartolic-Zlomislic & Bates, 1999; Sjogren & Fay, 2002), but splitting costs between fixed costs (those that remain constant regardless of output) and variable costs (those that increase or decrease in direct relation to output) is typically sufficient. For a course written in an eLearning mode, the costs of developing the course would be fixed; the costs of delivering the course would be variable.

Table 1 lists the actual categories of expenditure required for a typical eLearning project (based on Barfoot, et al., 2001).

Table 1 Categories of typical eLearning expenditure

Internal	Salaries of eLearning staff
Personnel	Additional costs—staff development, etc.
Outsourcing	Costs of releasing subject experts for the project External designers/programmers Costs of sourcing raw materials/content for the project
Management	Administrative costs
Overhead	Institutional services—premises, security, cleaning, desks, etc. Asset costs and depreciation—equipment purchase, maintenance, upgrading, etc. Administrative costs, such as telephone, stationery, etc.

It should be noted that using an additional internal person in a project will incur more than just the cost of their salary. Overhead costs will also need to be increased to cover the costs of their desk space, computer use, electricity use, etc., as well. Clearly, calculating the departmental overhead based on the overall budget for the department divided by hours of productivity has the advantage of expressing the real cost of an internal staff member at an hourly rate that includes more than just their salary.

The projected costs will need to consider all stages of the project from needs assessment right through to implementation and evaluation.

BENEFITS Rosenberg's (2001) four criteria (cost, quality, service, speed) provide a useful framework for determining the value of eLearning interventions. For the calculation of CBA and ROI it is important to be able to somehow quantify the benefits from

each criterion. Benefits that should be quantified include all potential flow-on benefits, such as:

Cost:

- Reduced costs associated with face-to-face classes, including room rental and travel costs (if any). If these costs are likely to rise, they should be included in the analysis also.
- Reduced wear and tear on physical teaching resources.
- Justifiable fee/materials charges through added value.
- Potential on-selling revenues.

Quality:

- Enhanced institutional reputation.
- Better student satisfaction and retention.

Service:

- Improved learning.
- Increased access and enrolments.
- Increased capacity through reduced use of physical teaching space.
- Subject matter expert (SME) and development team professional development. The subject matter expert development may seem like a false benefit, however experience with SMEs who work in lecture environments has demonstrated that reworking their existing resources helps them to better understand and express main points.

Speed:

- Enhanced delivery through flexibility.
- Increased adaptability and updating of course materials.

This is a general list, and not all of these benefits will apply for each eLearning project. Those benefits that do apply to a particular project should be quantified if at all possible. Financial benefits should

be calculated over the projected life of the course or learning object, as not all benefits will be realised in the year the eLearning initiative is created. eLearning initiatives require significant levels of investment up front, however their benefits are enjoyed for a number of years. When justifying eLearning projects it is therefore prudent that financial benefits are prepared based on three categories of benefit: direct (the "cost" category of direct financial benefits); indirect (the estimated financial benefits from "quality," "service," and "speed" categories); and on-selling.

Because Rosenberg's (2001) cost category is the only one that can be used as a firm basis for quantification and not all institutions will be comfortable with the thought of on-selling their eLearning materials, it is frequently necessary to create CBA and ROI figures that gradually include each form of benefit. Indirect benefits are extremely difficult to empirically ascertain and should therefore be used cautiously; however, they are very real to the institution.

WORKED EXAMPLE The Universal College of Learning (UCOL) has created a photography learning object (simulation) which is used twice a year for a small number of students (about twelve). It is estimated to have a six-year life span. The learning object explains the concept of portrait lighting and permits students to experiment with different lighting arrangements on a virtual subject. Students can also test their understanding of the relationship between light source and shadow. Before the learning object project was approved, the following justification was prepared (based on the six justification criteria outlined earlier):

1. Students have conceptual difficulty understanding the effect that lighting can have in portrait photographs. This is because it takes time to develop the sample shots they take with SLR (Single Lens Reflex) cameras and the difficulty of making sufficient studio time available to small groups so they can experiment with different lighting effects.
2. The eLearning solution will enable students to conveniently experiment with different lighting arrangements, and will test their ability to associate a particular portrait with the light positions used for that portrait.
3. Some content material can be adapted and included in the solution.
4. There are no similar solutions commercially available.

The potential value of the project and an itemised budget are detailed below (note costs are in NZD).

Direct Benefits:

- Reduced materials cost (film, processing, and paper) for teaching the

topic; potential savings of \$20 per student x 12 students = \$240 per offering.

- Freeing up of studio, cost of 1 hour x \$50 per offering = \$50 per offering.
- Less wear on equipment (lights, etc.), estimated at \$20 per offering.[†]

Indirect Benefits:

- Enhanced face-to-face contact and reinforcement of concepts, estimated at \$20 per student for a total of \$240 per offering.
- Staff development for gathering content material and generating exercises: \$200.
- Staff development for project team: \$400 (although it may actually be more, as each project builds up needs-based expertise that can be later exploited further).
- Enhanced institutional reputation as innovative, both for students and industry: \$600.

On-Selling Benefits:

- Potential sales of 10 copies at \$500 per institutional license.

Direct savings: $(\$240 + \$50 + \$20) \times 12$ (number of offerings)	= \$ 3,720.00
Indirect savings and additional benefits: $(\$240 \times 12) + \$200 + \$400 + \600	= \$ 4,080.00
On-selling revenues (potential): $10 \times \$500$	= \$ 5,000.00
Total potential return on investment over six years (\$2,133.33 pa):	= \$12,800.00

Note: This ignores the effects of interest and inflation, both of which will affect the value of future estimates. However, for the sake of internal controls, ignoring future dollar values is acceptable provided inflation is not running rampant!

The actual budget for the project was approximately \$8,100.00 including allocations to all internal overheads. The budget was prepared based on prior experience of simulation projects. The actual cost of the project was

\$8,935.00. The difference of \$835.00 was mainly additional expenses related to programming, which had the additional benefit of furthering the programmer's skill repertoire.

Table 2 Financial analysis

	Benefits	Budgeted Cost	CBA	Anticipated Return Per \$1 Invested (ROI)
Direct	\$ 3,720	\$8,100	0.46	-0.54
+ Indirect	\$ 7,800	\$8,100	0.96	-0.04
+ On-Selling	\$12,800	\$8,100	1.58	0.58

Table 3 Budget

Stage	No. of Hours	Cost (@ \$90ph)
Preliminary phase (initial assessment, solution analysis, proposal preparation and approval)	15	\$1,350.00
Management phase (actual creation of the intervention)	50	\$4,500.00
Implementation and evaluation phase (contextualisation of intervention, distribution, formal evaluation)	15	\$1,350.00
Unforeseen costs and rework	10	\$ 900.00
Total	90	\$8,100.00

However, this is all only part of the story. A case is made for the intervention to be created, but the following issues are not fully addressed:

- **Might the money be better spent elsewhere?** Perhaps, but the amount to be spent on this project is at least justifiable. Typically, decisions on major budgets are made at a level above that of the institution's eLearning function. It is also of significance that the project does consider its generous contribution to overhead costs, which must be covered regardless of whether or not the project is approved.
- **What about the effect of increased use on facilities such as computer labs and servers?** Typically this is not an issue for the eLearning team, as most institutions do not link their infrastructure costs to their

eLearning budget. There is also an institutional desire to increase the use of computer labs.

- **What about the fact that most of the costs are already absorbed into the eLearning team's salaries?** At least a return can be demonstrated, and the investment in eLearning salaries is shown to have a potential return beyond maintenance of existing eLearning systems.

CONCLUSION For any eLearning development project, costs and benefits need to be expressed as fully as possible so that a true picture of the financial situation can be given alongside the teaching and learning benefits that may arise. An effective system will continuously measure real costs and benefits, and adjust budgets and

projected savings accordingly. Even if an eLearning department is not required to account for its institutional budget in detail, such knowledge will assist in the efficient use of institutional funds and provide important considerations for the expansion or outsourcing of eLearning activities. ROI and CBA are useful tools for providing financial analysis on eLearning activities; however, their use often requires arbitrary quantification of qualitative benefit. While it may seem that this arbitrary quantification is merely an attempt to help improve ROI- and CBA-based justification of a project, many of the financial benefits of eLearning are indirect and would otherwise not be sufficiently considered.

Tracking costs within individual projects has the additional benefit of revealing potential bottlenecks or fine-tuning the outsourcing of tasks. Once a history of actual project costs is developed, it can be used as a contributing factor to buy-in/make decisions also. While these may not be fully accurate, they will be indicative and therefore of pragmatic use in justifying and illustrating the use of eLearning budgets.

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