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FuturEd Consulting Education Futurists Inc.
Dr. Kathryn Chang Barker, President
101 – 1001 W. Broadway, pod 190
Vancouver, BC
Canada V6H 4E4

phone: 250-539-2139 *fax*: 250-539-2129
e-mail: kbarker@futured.com *website*: www.FuturEd.com

eLearning and Adult Literacy: Exploring Return on Investment (ROI)

1. Introduction

This "ROI Guide" is intended to help in the analysis of Return on Investment (ROI) in eLearning with a particular focus on adult literacy. It begins with a discussion of terminology – adult literacy, ROI and eLearning; moves through the relationships between the three concepts with reference to the literature in the field, and concludes with a proposed methodology for determining ROI in eLearning from two perspectives – producer and consumer – and three types of adult literacy eLearning – information and assistance services (e.g., portals), indirect instruction, and direct instruction.

The three terms *adult literacy, ROI and eLearning* have multiple and complex meanings; therefore, this paper begins with a brief introduction to the concepts and a clear statement of how the terms are being used in this document.

1.1. Adult literacy

The term *adult literacy* is a short-hand term for the following:

- Many levels or types of adult learning and skills upgrading – Adult Basic Education (ABE), Adult Secondary Education and high school completion, GED and GED-Preparation, basic skills and workplace essential skills, family literacy. Related terms include adult and continuing education, community education, labour force development, workplace training, and others.

- Different approaches to understanding the associated problems and solutions – policies, programs, and practices

It is a term that implies "illiteracy" as a problem, on the one hand, and "literacy" as a human capital asset on the other. And finally, it is a term that "eliminates" literacy in the context of children and public schooling.

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There are many methods of studying ROI; many reasons for demonstrating ROI; many challenges to appropriate ROI. The first requirement is to identify perspective: producer and/or consumer. Then, the issue of potential costs and benefits arises. In addition to differing by perspective -- employer, individual trainee, trainer, society at large -- both costs and returns may be:

- tangible / measurable and/or intangible / difficult to measure
- direct and/or indirect
- immediate / short-term and/or evolving / long-term
- positive and/or negative
- intended or planned and/or unintended but achieved
- variable and/or fixed
- once-off and/or ongoing
- of equal value or prioritized in importance
- essential and/or optional

While it sounds daunting, a step-by-step approach makes it doable.

1.5. ROI Analysis for Learning Systems

In the context of learning systems, the analysis of ROI will be from at least two perspectives:

1. the producer – learning service provider (e.g., school, training service, government agency)

2. the consumer – the learner (individually and collectively)

An additional category is the eLearning producer; sometimes their data is relevant, sometimes it is not. Clearly, the categories of costs and benefits will be different for each.

Perspective	Typical costs	Typical returns / benefits
eLearning producer (commercial vendor or in-house)	• Computers and computing • Software and hardware • Content development • Instructional design • Student management systems • Learning delivery and management • Hosting • Administration • Facilities • Marketing and advertising	▪ sales ▪ new product ideas ▪ achievement of organizational goals
Learning provider (training agency, employer, community service, public school or college)	• cost of needs analysis/surveys • course design, development, purchase or license • salary of instructor, consultant, and/or staff • offsite travel, lodging, and meals • facilities rented or allocated • equipment and hardware • instructional and testing materials • course/training evaluation	▪ increased productivity ▪ customer satisfaction ▪ customer ROI
Learning consumer	• tuition • childcare • books and materials • equipment, e.g., computer • travel / parking • special fees, e.g., library • loss of income	▪ increased skill levels ▪ Increased self-confidence ▪ Increased employability ▪ Increased ability to participate

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Numerous writers in the field of cost analysis in education make a strong case for increasing its use so that managers can make decisions about how resources can best be allocated and used. According to Woodhall,[4] for example, cost analysis in education can serve the following purposes:

- Testing the economic feasibility of expansion plans, proposals, or targets.
- Projecting future levels of educational costs.
- Estimating the cost of alternative policies and of educational reforms or innovations.
- Comparing alternative ways of achieving the same objective in order to select the most efficient or economical.
- Comparing the profitability of alternative investment projects.
- Improving the efficiency of resource utilization.

In public expenditures, like public education, there is increased pressure to demonstrate ROI as an accountability mechanism. Parliamentarians need simple, balanced reporting to help them allocate funds. According to the OECD,[5] public accounting systems lag behind in their ability to adequately demonstrate the importance of education and training investment. The OECD, in fact, calls training -- on the macro/governmental level -- an intangible investment, and it is conducting major efforts to measure intangible investment as it relates to the Knowledge-based Economy.[6]

From a learner's perspective, eLearning programs and services may be offered by public or private sector agencies. Typically, public sector agencies, such as AlphaPlus in Ontario, develop or purchase products and services such as AlphaRoute, and make them available to service provides such as community agencies or community colleges, who make them available to students. In this case, then, there are three sets of producers and consumers for whom ROI may be an issue. The relationship is seldom as complex in the private sector. It may be summarized as follows.

ELearning Product / Service	Producer	Consumer
Government / public sector suite of eLearning services to adult literacy service providers	In-house or external eLearning agencies or businesses that develop and sell eLearning products or services (e. g., LMS platforms, instructional design, web portals)	Government agency on behalf of the taxpayer
Public or private sector eLearning service provider	Government agency or private enterprise that has made the suite of services available for purchase or license	*eLearning service provider, e.g., college or training agency*
Learning materials, courses and programs, credit or non-credit	*eLearning service provider*	Learner(s)

It becomes apparent that the role of service provider, in the middle between government and the learner, performs both a producer and consumer function. It may be hypothesized that, in the public sector, the two roles cancel themselves out, and the only real ROI relationship is between the government and the learner. In the case of the private sector, the ROI relationship is directly between the eLearning business and the student.

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4 *Cost Analysis in Education.* (Woodhall, 1987) In G. Psacharopoulos (Ed.), *Economics of Education: Research and Studies*, 1987, pp. 393-399.

5 *Human Capital Investment* (OECD, 1998) in OECD New Issues at http://www.oecd.org/

6 *OECD Work on Measuring Intangible Investment* at http://www.oecd.org/

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Why do ROI analysis for elearning? In summary,[7] ROI analysis for any learning products and services can be used to:

- demonstrate that learning can be an investment rather than an expenditure
- make informed choices between learning options
- encourage employers and employees to take learning more seriously
- compare the cost of learning to other business investment options, e.g., new equipment
- compare the cost of training/retraining to new hires
- justify and expand HR budgets
- contain and/or maximize learning budgets
- make course objectives and content more relevant
- focus learning on behavioural and/or organizational change
- refine and revise, or eliminate, weak learning programs
- improve the financial worth of human capital assets
- attract attention to a particular problems, e.g., with productivity
- market the value of particular learning products and services
- promote the importance of evaluation
- project future teaching/learning costs
- improve the efficiency of resource utilization
- hold employees accountable for the skills and knowledge acquired from formal learning;
- maintain a history of individual learning success
- document positive change in individual or organizational performance
- encourage transfer of training
- measure the effectiveness of education/training
- demonstrate accountability for learning expenditures and policies

Two ROI samples for learning systems (industry-based training and International Education in a public school) are found in Appendix A.

[7] Excerpted from *Return on Training Investment: An Environmental Scan and Literature Review.* (Barker, 2001) at http://www.futured.com/pdf/FuturEd%20ROTI%20Backgrounder%202001.pdf

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2. Context

This exploration of ROI in eLearning for adult literacy is set in a context of:

- established reasons or benefits to conducting ROI in adult literacy programs, policies and practices,
- research-based wisdom about ROI in learning systems, and
- what is currently known about ROI in eLearning.

2.1. Need for ROI in Adult Literacy

In a nutshell, there are very, very few studies that analyze the ROI of adult literacy programs and services, and there is repeated demand for it.

Thomas Sticht[8], noted American literacy researcher, says: "It is axiomatic that government spending should produce the very most for the monies spent." He recommends that all youth and adult education and employment training programs should be required to obtain accountability data on the extent to which the programs:

- Improve participation of adults in programs, including the daily attendance and retention of adults long enough to make real gains in learning;
- Improve achievement in functional context programs, including what make the programs functional context programs, how learning in the programs is improved over earlier programs, and how transfer to contexts outside the programs has been improved,
- Improve prevention of future learning problems of adult students' children by stimulating the intergenerational transfer of cognitive skills and positive attitudes bout education from adults to children, including how many children are affected in what ways, and
- Show how "double duty dollars" are being obtained in adult education programs to capture the multiple returns to investment in adult education.

The analysis of ROI from the learner's perspective becomes vital when one considers the following:

- 28% of adult Canadians make a personal investment in learning, and their numbers grow by about 2.5 million per year.[9] In 1993, approximately 50% of training and almost 84% of educational programs were paid for by the individual, sometimes with funding subsidies from government programs.
- Annually, between 20% and 30% of Canadians take some form of job-related training; and investments in training have increased over time.[10] On average, Canadian adult learners participate in 1.6 learning activities or 103 hours per individual annually.[11]

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8 *Adult Basic Education: Strategies to Increase Returns on Investnment* (Sticht, T; 1999) at http://www.nald.ca/fulltext/roi/front.htm

9 *Canadian Adult Learners and Learning Technologies*. (Office of Learning Technologies, 1998) available at http://olt-bta.hrdc-drhc.gc.ca/download/adultpr_e.pdf

10 *Survey of the Labour Force on Lifelong Learning, Training and Employment Issues, 1994-1995.* (Ekos Research, 1995).

11 *Adult Education and Training in Canada* (Statistics Canada, 1994) available at http://www.hrdc-drhc.gc.ca/arb/research/rsctoc_e.html

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- For workers, research on training impacts is clear and generally positive.[12] Training almost always produces more positive attitudes to training; impacts on employability and wages are often positive; and wage gains are greater for formal than for informal training. Impact on job turnover is mixed. Canadian studies indicate that the perceived benefits of training for workers, in order of importance, are greater job satisfaction, more portable skills and job mobility, improved morale, greater job security, better job opportunities within the company, and improved pay and benefits.[13]

Learners increasingly have choices, particularly the choice that eLearning represents. Learner investment in education/training is significant and they want to make good choices between options. The analysis of ROI is equally important to learning providers – colleges, community-based trainers, corporate trainers, and governments. The following is evidence that ROI analysis is possible.

Project EXCEL -- a workplace literacy project involving four small business enterprises in San Francisco -- reported the following accomplishments or "returns" that could be made tangible:

- improved opportunities for worker advancement
- increased use of English on the job
- improved worker productivity
- improved worker-manager relations and greater sensitivity by management to communication issues multicultural workplaces
- worker's increased interest and ability related to pursuing further literacy education
- development of a viable workplace literacy model for limited -English-proficient (LEP) workers
- development and dissemination of a modular curriculum for LEP workers in the apparel, communications and food services industries
- continued interest in and support for workplace literacy by the San Francisco business community.

2.2. Current Wisdom about ROI in Learning Systems

While there is a shortage of research into ROI for literacy, there is a considerable amount for training. The following observations about learning systems, found in the literature of Return on Training Investment (ROTI), are relevant to ROI in eLearning.

- Not all teaching/learning can or should demonstrate ROI.

- Traditional classroom education/training will normally have a lower development cost and a higher delivery cost; interactive and distance education training will normally have a higher development cost, but a lower delivery cost.[14]

- The technology that delivers the course material has never been significant to the results achieved by the student (the “no-significant-difference phenomena)[15]. However, format is a factor in learning effectiveness when the learner is prejudiced toward one of the formats available or when the course engineering is substantially different.

- The maximum return on self-study products is directly related to the number of times it is used.[16]

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12 *Lifelong Learning: A Summary of Recent Research* (Ekos Research, 1997)

13 *Survey of Employers on Training and Employment Issues* (Ekos Research, 1993)

14 According to an e-learning firm called Lets Talk Selling at http://www.letstalkselling.com/

15 The “no significant difference” website from links at http://distancelearn.about.com/education/distancelearn/library/blpages/blnsd.htm

16 *Maximizing Your Return on Investment* at http://www.videoed.com/etroi2.html

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- Costs should be calculated over the shelf-life of a training program; however, it is difficult to know how many times is will be run before no longer being needed. The benefits of training should extend well beyond the final offering. The payback period can typically be projected one to five years.

- According to the OECD, education and training contribute to better public health, lower crime, the environment, parenting, political and community participation, and social cohesion.[17]

- The impact of public labour market training programs shows some impact on unemployment, as well as benefits to some individuals but possibly at the expense of others. Well-targeted programs providing market-relevant skills are more effective.[18]

- The OECD has concluded that the rate of return on investment in education/training -- human capital investment -- is as favorable as that on physical capital investment.[19]

- Most ROI analyses are for comparative studies: comparison between different types of training (on-the-job vs. off-the-job; individualized vs. group, centralized vs. regional); comparison between different types of investment (new hires vs. retraining).

- Generally speaking, training works better in the workplace than in the classroom; in partnership rather than self-directed; linked to a specific application such as new technology; in a state of employment; and for those already possessing sound basic education and skills.[20]

A lot of useful information is available on the Internet.[21]

2.3. ROI in eLearning

eLearning is the most recent addition to the training community, and many providers of eLearning present the argument that there is greater ROTI for e-learning versus face-to-face or traditional training practices. For example *Information Week* surveyed more than 300 Information Technology executives and found that, while conventional classroom instruction costs about $75 per hour, computer-based training costs about half that amount. Because employees don't have to take time to travel, corporations see distance learning, or desk-top learning, as a time- and money-saver.[22] The actual cost of the eLearning was not revealed.

More objective assessments of eLearning warn that, for example, the one-time savings in travel aren't worth much if the online learning doesn't lead to ongoing, measurable business benefits. An overview of e-learning evaluations and research, conducted by Jack Phillips and the ASTD,[23] concluded:

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17 *Counting Human Capital* (Healy, 1998) in the OECD Observer at http://www.oecd.org/

18 *Human Capital Investment: An International Comparison.* (Centre for Educational Research and Innovation, OECD, 1998; p. 61).

19 *Human Capital Investment* (OECD, 1998) in OECD New Issues at http://www.oecd.org/

20 *Lifelong Learning: A Summary of Recent Research* (Ekos Research, 1997)

21 See for example:
- http://strategis.ic.gc.ca/epic/internet/inee-ef.nsf/vwGeneratedInterE/h_ee00633e.htmlhttp://strategis.ic.gc.ca/epic/internet/inee-ef.nsf/vwGeneratedInterE/h_ee00633e.html
- http://www.trainingshare.com/download/train2002/eval_articles.doc
- http://www.e-learningguru.com/toolbox.htm
- http://www.e-learningcentre.co.uk/eclipse/Resources/costs.htm
- http://www.futured.com/pdf/ConGuide%20Eng%20CD.pdf

22 *Distance Learning Money Issues* (Hirst, 2000) at http://www.about.com/

23 *Evaluating the Effectiveness and the Return on Investment of E-learning.* (Phillips, Phillips, and Zuniga; 2000) available at http://www.astd.org/virtual_community/research/What_Works/e-learning/e-learning_main.html

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Most of the current evaluation at the business impact or ROI level has been driven by clients of e-learning, i.e., those who are funding the project.

- Available evidence suggests that conventional training yields more favorable responses than e-learning solutions. (Level 1, Kirkpatrick)

- eLearning is as effective as conventional training. Recipients of conventional training express more satisfaction (Level 1, Kirkpatrick), but the learning outcomes are not different from participants in e-learning programs (Level 2).

- The same evaluation strategies (Levels 1-5) can be applied to e-learning programs.

- ROI studies indicate a positive return for companies implementing e-learning programs. Most studies show a positive return based on cost reduction alone, but there is a need to also analyze the benefits.

- Building evaluation into the computerized training process can save time as well as money.

Some education/training providers are concerned with ROI in eLearning to their institutions or agencies, i.e., the costs and benefits of new programs and approaches. For example:

The TeleLearning Network of Centres of Excellence funded studies assessing the costs and benefits of tele-learning for OISE, UBC and other universities.[24] The ROI analysis was not for the learner, but for the institution given the significant resources required to move from the traditional classroom delivery to technology-assisted, web-based delivery.

Wentling and Park[25] conducted a cost analysis of eLearning for a university program, again from the institution's perspective; they concluded that start-up costs were sufficiently high that the eLearning course at University of Illinois has yet to "break even."

According to Nineveh, an Italian eLearning agency,[26] some universities shift some of the costs to the learner, i.e., the purchase of a computer, fees for communication costs, peer and self-support, or on to the faculty, mostly in terms of incremental time devoted to online instruction. Other institutions hold as a principle that technology costs should not be moved to the end users. Third parties, such as learning platform vendors, telecom or software companies, in the context of partnerships, sometimes bear part of the costs as well.

Morgan,[27] at Marshall University in Australia, conducted an in-depth study to determine the costs of online courses. For him, categories of cost factors included capital and recurrent costs, production and delivery costs, and fixed and variable costs. Capital costs were for infrastructure, equipment and materials necessary for the offering of courses. Recurrent costs are those that occur on an ongoing basis, e.g., ICT support. Production costs are incurred during the development, while delivery costs are associated with teaching. Fixed costs do not change regardless of the number of students while variable costs do. At his university in 1997-1999, total

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[24] *Assessing the Costs and Benefits of Telelearning: A Case Study from the University of British Columbia* (Bartolic-Zlomistic and Bates, 1999); *Assessing Costs and Benefits of Telelearning: A Case Study from the Ontario Institute for Studies in Education of The University of Toronto* (Bartolic-Zlomistic and Brett, 1999); *Cost Benefit Analysis of Web-Based Telelearning: Case Study of the Bell Online Institute Pilot Project* (Whalen and Wright, 1998)

[25] *Cost Analysis of E-Learning: A Case Study of a University Program* (Wentling and Park, 2002) at learning.ncsa.uiuc.edu/papers/ AHRD2002_wentling-park.pdf

[26] *Costing e-Learning: The Need for Cost Analysis in e-Learning* (Nineveh, undated) at omero.polito.it/ nineveh/docs/costingelearningfinal_2doc.pdf

[27] *Is Distance Learning Worth It? Helping to Determine the Costs of Online Courses.* (Morgan, 2000) at http://www.marshall.edu/distance/distancelearning.pdf

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cost for developing a course was $301,331 and cost for delivery was $225,569; total revenues over two years were $456,741; Morgan determined a cost savings of $169,491.

The measurement of ROI in eLearning is highly contentious, in part because it is difficult and in part it has been "abused" by commercial vendors. The majority of ostensible ROI articles on the Internet simply intend to convince the purchaser of the merits of eLearning over conventional, classroom based learning.[28] Current literature focuses on the need to be realistic and honest about ROI – with the knowledge that eLearning is very expensive at the front end. In answering the pressing question "How much does eLearning cost?" Bassi,[29] in writing for the ASTD, proposes the following rules:

1. The direct cost of developing and delivering learning – whether it is via eLearning or traditional training – is just the tip of the iceberg. Indirect costs are typically far greater than direct costs; opportunity costs, greater still.

2. Costs and benefits are co-determined. It may be inexpensive to create ineffective, boring learning services; "Creating highly beneficial learning is rarely inexpensive."

3. Just because costs can be shifted does not mean that they are zero. For example, if learners are engaged "on their own time" this does not mean the cost goes away.

4. When costs are shifted without a corresponding benefit, they will ultimately be shifted back.

Current literature suggests that measures of effectiveness need to move from "cost savings" to, e.g.,

- learning efficiency[30] -- the sum of knowledge and skills gained that improves performance divided by the sum of all the information delivered during the learning process;

- total cost[31] – the sum of the fixed costs plus the (sum of all marginal costs x the number of learners)

- true cost[32] – direct and indirect costs of program development, delivery and maintenance.

A variety of ROI tools for eLearning are available on the Internet, for example:

- at eLearning Guru, a workbook approach (http://www.e-learningguru.com/articles/art5_2.htm) for comparing eLearning and conventional instructor-led, classroom-based training

- from Allen Communication Learning Services, an ROI web application (http://www.allencomm.com/roi/elearning_roi.html) for assessing blended eLearning / training

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[28] See for example
- *Return-on-Investment (ROI) from eLearning, CBT and WBT.* (Kurtus, 2002) at http://www.school-for-champions.com/elearning/roi.htm
- *Calculating the Return on Your eLearning Investment* (Docent, Inc,. undated) at http://www.docent.com/whitepaper/pdf/calc_roi.pdf
- *Collaboration Solutions for the Real-time Enterprise (*Centra, undated) at http://www.centra.com/roi/calculator.asp

[29] *How Much Does eLearning Cost?* (Bassi, 2004) at http://www.linezine.com/2.1/features/lbhmec.htm

[30] *ROI for eLearning* (Moran, 2002) at http://www.learningcircuits.org/2002/feb2002/moran.html

[31] *How Much Does eLearning Cost?* (Bassi, 2004) at http://www.linezine.com/2.1/features/lbhmec.htm

[32] *Measuring the Total Cost of e-Learning* (Kruse, 2004) at http://www.e-learningguru.com/articles/art5_2.htm

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- a Technology Costing Methodology, from the Western Cooperative for Educational Telecommunications and the National Centre for Higher Education Management Systems, at http://www.wcet.info/projects/tcm/download.asp

- For others, see below.[33]

From the literature, the tangible and intangible returns to eLearning service providers appear to be:

- decrease in travel and associated costs for instructors and student
- less "time off" job
- less costs for dedicated classrooms
- ability to extend programs without hiring more people
- reproduction costs minimized
- inexpensive distribution and delivery via the Internet
- easy updating of courses
- flexibility in creating new courses
- accelerate revenue by accelerating time-to-market
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For the learner, the benefits may be:

- just-in-time access to timely information
- consistency of information and content integrity
- flexibility in access to programs
- training benefits: new skills and knowledge

In conclusion, the Organization for Economic Development and Cooperation (OECD)[34] hypothesizes that there is an actual absence of return on investment in ICT and eLearning because:

- Educational software does not keep pace with technological advances and does not live up to expectations in terms of quality.

- There has been inadequate effort in the professional development of teachers for technology use.

- There is a lack of good content in effective online learning materials and resources.

- There is low transferability of educational software produced in one cultural setting to others.

- There is a tendency to imitate the traditional classroom environment rather than to capitalize on the opportunities and potential offered by the new digital media.

Others are beginning to express similar opinions.[35]

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[33] See for example:
- http://www.marksteinerinc.com/Resources/Cost_Estimators/_eLearning_Calculator/_elearning_calculator.html
- hale.pepperdine.edu/~cscunha/Pages/INDEX.HTM

[34] Cited in *Costing e-Learning: The Need for Cost Analysis in e-Learning* (Nineveh, undated) at omero.polito.it/nineveh/docs/costingelearningfinal_2doc.pdf

[35] *Costs Negate eLearning ROI.* (Hoffman,2002) at http://www.computerworld.com/managementtopics/roi/story/0,10801,77008,00.html?nas=CAR-77008

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3. Measuring ROI

There are many ways to determine ROI, from the simple to the very complex. Making a choice is one of the first steps, but not the only one! ROI models have been developed for different reasons. For example, the objective of vendor-based models is to increase sales; the objective of academically-based models is often for publication and peer view feedback; the objective of organizationally-based models is internal justification.[36] In choosing an ROI model, the pivotal question is "who needs to know what?"

It is also important to note that ROI analysis is conducted selectively, usually involving 5-10% of all programs.[37] Typically, ROI analysis is conducted to provide information for (1) informed decision-making and/or (2) informed choice between options. In that case, the analysis should be done on different models rather than more of the same.

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- the Kirkpatrick evaluation model
- training utility formula
- Bell System Approach
- productivity measurement
- value added analysis
- payback period analysis
- Information Economics
- Balanced Scorecard
- measuring intellectual assets
- investment impact comparison

3.1. Simple ROI Formulae[38]

For one-time programs

Program Benefits / Costs X 100 = ROI (expressed as a percentage)

For prepared programs

Total cost of design, development, duplication, delivery and support
(divided by) the number of students over the life of the course

For a range of results

ROI = (value of benefits - cost of training) / cost of training

[36] *Cost/Benefit Analysis* at http://www.strategis.ic.gc.ca/sc_indps/itt/newmedia/media2/es3-24.html - HEADING24-0
[37] *ROI Best Practices* (Phillips, 2003). At http://www.clomedia.com/content/templates/clo_fairfield.asp?articleid=275
[38] *Raise Your Training ROI* (Chase, 1997) in Quality On-line at http://www.qualitymag.com/articles/1997/sep97/0997f3.html

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3.2. Complex Formulae that apply to eLearning

The following formulae are provided for comparison purposes.

3.2.1. Information Economics[39]

Information Economics (IE) is defined as a collection of computational tools that allow rational comparison of benefits and costs of ICT projects. It goes beyond cost-benefit analysis by providing an assessment of what the (learning) project is worth to an organization, and whether the organization has the resources necessary to complete the (learning) project.

IE focuses on value rather than limited concepts of benefit and hard dollar savings; it attempts to quantify intangible benefits and risks of both business and technical issues, e.g., increased knowledge worker productivity, improved communications, and enhanced quality. IE typically suggest six classes of value:

- Enhanced ROI – expanded to include additional methods such as value acceleration, value linking, and value restructuring; includes, e.g., cost avoidance, reductions in operating costs and performance improvements such as improved timeliness, quality and decision-making
- Strategic Match – a measure of how closely aligned the project is to the organizations strategic goals
- Competitive Advantage – estimates of the degree to which the project provides an advantage in the marketplace
- Management Information – reflects the value of the information or improved information to the organization/management; the more essential the information to the functioning of the business, the greater the value
- Competitive Response – estimate of the consequences of not implementing the project/training
- Strategic IS Architecture: assumes that there is some strategic plan for Information Systems in the organization, and is used to measure how the training/project fits into the overall plan in terms of long-term support requirements, disruption to business during the start-up period, and ongoing learning requirements

A sample application of IE is found in the tool developed by Oracle Corp. called CB-90 – Cost Benefit for the Nineties. CB-90 breaks the analysis down into three factors: tangible cost/benefit analysis, intangible cost/benefit analysis, and intangible risk analysis.

3.2.2. Results Oriented HRD Model[40]

This model takes into account the total human resource development process, from needs analysis to communicating program results. It is based on an 18-step process, with 11 steps involving some form of evaluation. While the model may seem too complex for small and medium-sized organizations, it can be modified to meet specific needs. The model provides a comprehensive approach to designing, developing, and implementing a human resource development program at all levels. Determining training's contribution in organizational performance is an important part of this process.

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[39] *Evaluating a Performance Support Environment for Knowledge Workers* (Thomas, Baron and Schmidt, 1995) at http://www.cecer.army.mil/kws/tho_know.htm

[40] *Handbook of Training and Evaluation*, (Phillips,1998)

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3.2.3. Balanced Scorecard[41]

The Balanced Scorecard concept was introduced and expanded by Robert Kaplan and David Norton in three articles published in Harvard Business Review over the period of 1993 - 1996, and a book published in 1996. The BSC is a conceptual framework for translating an organization's vision into a set of performance indicators distributed among four perspectives: Financial, Customer, Internal Business Processes, and Learning and Growth. Through the BSC, an organization monitors both its current performance (finances, customer satisfaction, and business process results) and its efforts to improve processes, motivate and educate employees, and enhance information systems--its ability to learn and improve.

3.2.4. Measuring Intellectual Assets[42]

The following are techniques used to value intangible assets.

1. Relative value: progress, not a quantitative target, is the ultimate goal; e.g., have 80% of employees involved with the customer in some meaningful way.

2. Competency models: by observing and classifying the behaviors of "successful" employees ("competency models") and calculating the market value of their output, it's possible to assign a dollar value to the intellectual capital they create and use in their work.

3. Subsystem performance: sometimes it's relatively easy to quantify success or progress in one intellectual capital component such as patent assets.

4. Benchmarking:[43] involves identifying companies that are recognized leaders in leveraging their intellectual assets, determining how well they score on relevant criteria, and then comparing a company's performance against that of the leaders.

5. Business worth: centers on three questions. What would happen if the information/training now in use disappeared altogether? What would happen if the amount of key information/training available was doubled? How does the value of this information/training change after a day, a week, a year? Evaluation focuses on the cost of missing or underutilizing a business opportunity, avoiding or minimizing a threat.

6. Business process auditing: measures how information/training enhances value in a given business process, such as accounting, production, marketing, or ordering.

7. "Knowledge bank:" treats capital spending as an expense (instead of an asset) and treats a portion of salaries (normally 100% expense) as an asset, since it creates future cash flows.

8. Brand equity valuation: methodology that measures the economic impact of a brand (or other intangible asset) on such things as pricing power, distribution reach, ability to launch new products as "line extensions."

9. "Calculated intangible value:" compares a company's return on assets (ROA) with a published average ROA for the industry.

3.2.5. Impact Comparison of Alternative Investments[44]

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[41] Information available at http://www.balancedscorecard.org/

[42] *Measuring Intellectual Assets* (Montague Institute, 1998) at http://www.montague.com/le/le1096.html

[43] More specific advice on benchmarking (*Ten Steps of Benchmarking*) is available at http://www.strategis.ic.gc.ca/sc_mangb/strategy/engdoc/tsob.html

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This model is undertaken in two phases: a behavioural audit, and calculations of ROI. The results of the behavioral audit demonstrate the extent to which the learner is using the skills presented in the training program. If s/he is not using the skills, it would be difficult to demonstrate a return on investment from the training program. The concluding question asks: Is this a good return on training investment? To determine whether it is a good investment alternative, compare the returns generated with corporate return on assets. If the return is greater than the corporate return on assets, it can be concluded that training has been a good investment. If the return is equal to or less than corporate return on assets, there are likely better investment alternatives.

[44] *How to Measure Sales Training Return on Investment* (Goldner, 1997) at http://salesdoctor.com/longterm/6train5.htm

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4. Planning for ROI analysis

Consideration of the following elements serves to guide decision-making about the resources for and utility of ROI analysis.[45]

4.1. Timing

For some, conducting ROI is a one-time-only processes, perhaps to evaluate a particular training program or to compare options to meet a training need. For others, ROI is incorporated into business operations as an ongoing strategy for, e.g., risk management or effective human resources management.

ROI analysis is easiest when the eLearning has been designed and delivered with:

- an early focus on the client through, e.g., interviews, observations, surveys and participatory design and development methods
- one management team for analysis, design, development, implementation and evaluation
- an empirical design, i.e., based on observation, measurement of behaviour, careful evaluation of feedback, and a strong motivation to make design changes when needed
- continuous improvement through a repetition of processes (implementation, testing, feedback, evaluation, and change) throughout the eLearning system's life.
- records, i.e., a complete audit trail.

4.2. Cost

The ROI process will add costs and time to the evaluation of programs, although a comprehensive ROI process should not cost more than 4-5 percent of the overall training and HRD budget. Training Magazine reports that one major firm usually spends about $5000 for an ROI impact study.

4.3. Planning

A successful ROI implementation requires much planning and a disciplined approach to keep the process on track. Implementation schedules, evaluation targets, ROI analysis plans, measurement and evaluation policies, and follow-up schedules are required.

4.4. Reliability and Validity

Attention needs to be paid to the quality of the measurement instruments. They must provide information that is valid and reliable. Reliability means that the instrument(s) should produce the same results when used under the same conditions; i.e., they should be consistent. Validity means that the instrument(s) should provide data and information that is relevant and accurate.

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[45] *Return on Training Investment: An Environmental Scan and Literature Review.* (Barker, 2001) at http://www.futured.com/pdf/FuturEd%20ROTI%20Backgrounder%202001.pdf

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4.5. Credibility

When reporting training results, credibility is always an issue. It's crucial that data be accurate and that the conversion process be believable. It is recommended that you:

- Take a conservative approach when making estimates and assumptions
- Use the most credible and reliable sources for estimates
- Explain the approaches and assumptions used in the conversion.
- When results appear overstated, consider adjusting the numbers to achieve more realistic values.
- Use hard data whenever possible.

4.6. Perceptual Challenges to Consider

For ROI analysis to be effective, the barriers have to be identified and addressed at the outset. Some are attitudinal, others are actual, e.g., the benefits of training may take a long time to become obvious and/or the benefits could be due to other factors. Some other **negative perceptions --** that can be overcome -- are the following.

- *The costs of training are known and expressed in dollars, but the benefits may be soft, subjective and difficult to quantify for conversion to dollars.*

- *It is difficult enough to get managers to send people for training without imposing additional requirements to collect data to document impact.*

- *Costs are known up front, before training, but benefits may accrue over time; and it's difficult to determine when to assess the impacts or benefits.*

- *Most trainers lack the time and accounting skills to do cost/benefit analysis.*

- *Requests for impact data may disrupt productivity.*

- *Many of the most popular training programs will be operated even if costs exceed benefits, so conducting ROI may be a waste of time.*

- *The outcomes of ROI could be damaging to the HR staff and to budget support from top managers, so it may be better not to know.*

- *It is difficult to attribute a person's behaviour to any particular reason, much less to a specific training event.*

- *The very act of collecting data on the dollar value of performance will tend to bias information that is elicited, making it hard to present an accurate picture.*

- *Course evaluations are viewed as inconsequential by some and assessment of impact as too time-consuming and costly.*

  Some training programs have been implemented for the wrong reasons (such as an effort to chase a popular fad or trend in the industry). A ROI calculation for an unnecessary program will likely yield a negative value. Training won't help if the problem isn't lack of worker knowledge and skills.

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4.7. The Conversion Challenge

True ROI analysis requires that all data be converted to monetary values, and although not all data can be converted, it should be attempted. There are five steps for converting either hard or soft data to monetary values.

Item 1: Focus on a single unit (e.g., completion rates, sales, employee turnover, employment rates)
Item 2: Determine a value for each unit (e.g., cost per item)
Item 3: Calculate the change in performance attributable to the product/service
Item 4: Obtain an amount per timeframe (e.g., per year, per offering)
Item 5: Determine the annual value of improvement: the annual performance change multiplied by the unit value. ROI then equals the net annual value of improvement less the program cost.

Other ways to convert data to monetary values include, e.g.,:

- calculating the cost of quality
- converting learners' time
- using internal and external experts
- using historic costs
- using data from external studies
- using participants' estimates
- using managers' estimates

Some ROI specialists speak of "reasonable evidence" in an ROI calculation – converting Return on Expectations to numerical value by quantifying opinion survey results and translating that to monetary values.

Some results -- changes in values, ethics, attitudes, specialized knowledge -- should be presented as intangible benefits.

4.8. Qualities of a Good ROI Plan

Using these criteria, you will know if you have a good ROI plan.

1. utility -- Is it practical and useful?
2. feasibility -- Is it doable? How much time does it take?
3. ethicality -- Does it respect legal and ethical issues?
4. accuracy -- Is it honest and technically sound?
5. acceptability -- Is it agreed upon by all stakeholders?
6. efficiency -- Is it cost effective relative to the cost of the training?
7. adaptability -- Can it be used for different types of training?
8. inclusiveness -- Does it address a range of measures and information sources?
9. flexibility -- Can it be used before, during, and/or after training?
10. effectiveness -- Does it meet a need for information?
11. credibility -- Is it believable?

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5. Conducting ROI Analysis in eLearning

Step one: Clearly identify the eLearning product or service that is to be studied.

The ROI data to be gathered, and the process for doing so, will relate to the nature of the eLearning which may be, e.g.,:

- A teaching/learning course/program that is:
    - self-study or instructor-led
    - completely online or a supplement to traditional classroom instruction
    - individualized or group-oriented
    - non-credit or part of a formal credential (e.g., GED)
    - short-term or long-term
    - free of charge or fee-based
    - ___
- An information/learning service that is:
    - Free of charge or fee-for-service
    - Aimed at learners or at service providers
    - Mediated by service providers or unmediated
    - ___

What is the nature of the eLearning product or service?
Who is the target audience? (e.g., individuals, groups, special needs groups)
For whom will the ROI analysis be conducted? (service provider, learner or both)

We will be studying the ROI for: from the perspective of:

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Step two: Identify the "units of analysis".

In addition to choosing the "perspective" for costs and returns/benefits, it is necessary to choose from among:

- timeframe (e.g., per year – school, fiscal, calendar; per semester; per course)
- timing
    - one time only (e.g., needs analysis and product development)
    - ongoing (e.g., maintenance, upgrading)
    - per offering (e.g., online fees, consulting fees, instructional fees)
    - per participant (e.g., registration fees, opportunity/employment cost)
- service area (e.g., geography, institutional mandate)
- payback period (e.g. immediate, short-term, long-term)

The benefits of learning typically extend well beyond the final offering. For training, the payback period can typically be projected one to five years.

How will we describe costs and outcomes in terms that others understand?"

The ROI analysis will be limited to:

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Step three: Categorize the tangible and intangible costs to be included in the ROI study.

All costs must be included, and they will be unique to each stakeholder perspective. Costs will fall into three categories: production costs, delivery costs and usage costs.

1. **eLearning Production costs (direct and indirect)**

Without question, determining best estimates for the courseware development costs and associated hardware is challenging. Where a suite of services is involved, it may be necessary to break the suite apart for cost determination purposes. Best case scenario for eLearning users is to have a "purchase price" rather than an "in-house development" cost.

However, since determining the costs in eLearning is difficult, some do an analysis by:

- The hour -- typical development costs are estimated to be $16,000 US per hour[46] compared to $4000 US per hour for classroom-based training
- The page (writing the content, designing the page and adding illustrations, producing multi-media effects) – 3-5 days per page for contents and graphics; audio and video at $35,000 US per hour
- Per student hour (e.g., Inglis[47] suggests that it may take up to 100 hours of development time to create one hour of student material)

Design and Development Costs for _____	
Item (Capital and Recurring Costs)	**Costs**
1. Development of the technologies used to teach 2. Hardware and specialized software 3. Content (purchase, development, license) 4. Instructional design 5. Student management system 6. Learning delivery and management system 7. Materials production 8. Service costs: computers and Internet hosting 9. Advising costs: copyright and legal services 10. Indirect costs _____	
Total Design Cost	

[46] *Return-on-Investment from eLearning, CBT and WBT.* (Kurtis, 2002). At http://www.school-for-champions.com/elearning/roi.htm

[47] *Is Online Delivery Less Costly than Print and Is it Meaningful to Ask?* (Inglis, 1999) cited in *Is Distance Learning Worth It? Helping to Determine the Costs of Online Courses.* (Morgan, 2000) at http://www.marshall.edu/distance/distancelearning.pdf

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2. Delivery Costs (Direct and Indirect)

Delivery Costs (Direct costs) for _____	
Item	**Costs**
1. Use of learning platform (purchase or lease) 2. Instructor costs (salary and benefits) 3. Support costs (student, teacher, technical) 4. Instructor training and professional fees 5. Equipment purchase and upgrading 6. Student materials 7. Communications (bandwidth and server access) 8. Opportunity cost (e.g., computer downtime) 9. Evaluation (delivery, product, personnel) 10. Indirect delivery costs 11. Other _____	
Total Direct Delivery Cost	

Administration and Maintenance for _____	
Item	**Costs**
1. Tracking (e.g., Student registration, certification) 2. Technical support 3. Updates to content 4. Updates to technology 5. Administration (e.g., personnel, facilities) 6. Other _____	
Total Indirect Delivery Costs	

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Step four: Categorize the tangible and intangible returns/benefits to be included in the ROI study.

The learning outcomes and benefits may be:

- different for each stakeholder group, e.g., employer, employees, communities, service providers
- planned (intended) and/or unplanned (unintended)
- tangible (quantifiable) and/or intangible (qualitative)
- long-term and/or short-term
- immediate and/or ongoing
- positive and/or negative
- for individuals or for groups

The outcomes under study will be those which are:

Returns / Benefits for eLearning Providers _____	
Tangible Returns (Direct and Indirect)	**Value**
Intangible Returns (Direct and Indirect)	**Value**
Total Returns to Providers	

From the training literature, typical learning benefits may fall into four categories:

- time savings (less time needed to reach proficiency, less supervision needed, etc.)
- better quantity (faster work rate, less down time, not having to wait for help)
- better quality (fewer rejects, lost sales, reduced accidents, lower legal costs)
- personnel data (less absenteeism, fewer medical claims, reduced grievances)

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From the literature on education policy, typical learning benefits may include:

- achievement and completion rates
- satisfaction and ROI rates
- access and uptake rates
-
-

From the literature on social policy, typical learning benefits may include:

- improved employment rates
- decreased social assistance roles
- increased access to appropriate services
- increased participation rates
-
-

From the literature on eLearning, typical benefits may include:

- reduced delivery costs
- increased access to innovations and services
-
-

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Step five: Determine the data to be gathered and the means of doing so.

A variety of data collection methods will be needed to encompass both tangible and intangible costs and benefits. There may be existing data to use (e.g., productivity measures or industry benchmarks) or new data may be required (e.g., employee estimates and opinions). New data may be gathered by, e.g.,

- analysis of documents and records (e.g., completion rates, evaluation reports)
- opinion surveys of individuals or focus groups
- observation
- one-on-one interviews
- performance tracking

As with all forms of program evaluation or assessment, the issue of "attribution" is raised. Can the returns or benefits be attributed to this eLearning course or service? In an ideal world, one would want to isolate the learning returns or effects, and be clear about other intervening variables. This may be achieved through, e.g., use of control groups, forecasting, participant estimations, management estimation and/or expert estimation. Generally, two approaches are better than one. It should be understood that ROI figures aren't precise, though every effort should be made to isolate the eLearning effect.

Step six: Conduct a Simple ROI analysis.

Gather the data.

Convert all data to monetary values.

Returns / Costs x 100% = _____% ROI

Ask yourself: is this a defensible ROI analysis? (see page 18).

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Appendix A: ROI Samples

ROTI Analysis: Training by a Seafood Processing Plant Conducted by FuturEd[48]

Training Costs

For this case study, determining training costs required going into back files; however, this wasn't too difficult because good records had been kept. Over the three years, the following costs were incurred:

• Training needs analysis and research	$500
• Training equipment and aides	$500
• Facilities rental	$2500
• Participant meals and travel	$5000
• Participant's salaries (22.612 instructional hours x average hourly rate of $14.70)	$332,396
• Fees to consultants and instructors	$120,000
Total training cost over 3 years	**$460,896.**

Training Returns

From the list of potential tangible training returns, this business acknowledged that many were important, but it was impractical to determine specific returns such as retention and safety rates. In the view of management, they were all reflected in increased productivity and in the sustainability of the business. Productivity is carefully measured and reported on a daily basis through computerized measurements. Teams know at all times what their productivity rates are and are first to identify problems and solutions. The overall goal of the three-year training program had been to implement self-directed work teams, for which the two measurements are (1) less time required to perform operations and (2) less supervision need. Therefore, over the three years, the following returns were accrued:

Return category	Calculation	Total
1. Less time required to perform operations (hours saved over three years x salary dollar amount)	24,000 hours x 3 years = 72,000 hours x $13.80 average salary	$993,000.
2. Less supervision needed (hours saved x supervisory salaries)	10,400 hours x 3 years = 31,200 hours x $24.00 average salary	$748,800
	Total Return	**$1,741,800**

ROTI Conclusions

Using this formula: Training Benefits / Costs X 100 = ROTI, **the Return on Training Investment, to the employer over three years, is 378%** ($1,741,800 / $460,896 x 100). For each dollar spent on the training over three years, the employer accrued a return of $3.78 in terms of decreased costs and increased productivity.

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[48] *Why Train? Calculating the Return on Training Investment* (Barker, 2002) at http://www.futured.com/pdf/ROTI%20WORKBOOK.pdf.

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ROI in International Education
Foreign Student Case Study Conducted by FuturEd 2003[49]

Recruitment of foreign students is a common form of International Education, with delivery of learning services taking place at the client's location, at the Canadian institution, and/or using distance education. Foreign student recruitment is typically undertaken for revenue generation first, and philanthropic purposes second. The following is an ROI case study of this type of IE.

Perspective

While the ROI could be studied from the perspective of students, the community of Richmond and/or the BC economy, the perspective for purposes of this study is the financial experience of Richmond School District. Specifically, we examine what RSD has invested and what the returns for that investment are relative to the recruitment of and service to foreign students. Administrative personnel note that this IE activity is not completely discrete from other school district IE activities, such as student and staff exchanges, ESL training, and sale of curriculum.

Unit of Analysis

Options for the unit of analysis, in this case study, might be per student or per school, or over the duration of the program. For this case study, we use per school year because that is the organizing structure behind how the school district accounts for and manages students and finances.

Costs

Costs typically fall into two categories: tangible and intangible. Both are important to and acknowledged by public education institutions, however, ROI analysis focuses on the tangible costs and all costs must be included to do an acceptable ROI analysis. In this case study the following tangible costs have been tabulated by Richmond School District head office.

EXPENDITURE ITEM	2001/2002 COST
IE Coordinator salary and benefits	$103,955
Admin assistant salary and benefits	$42,198
Staff memberships, PD, travel costs	$11,000
Teaching assignment (105 students / 17.297; 6.2 teaching staff)	$421,076
Administrative time blocks (1/15 students per school added)	$108,602
School Cash Allotment ($405/ Sept. student plus $202.50/ Feb. student)	$63,788
MSP Premium (@ $700 /Sept. student plus $350/ Feb. student)	$110,250
Marketing (marketing trips, materials and communications)	$157,836
Office expenses (telephone, supplies)	$5,200
TOTAL	**$1,023,903**

[49] Complete study *Return on Investment Analysis of International Education* (Barker, 2003) is available at http://www.futured.com/pdf/ROI in IE.pdf.

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Returns

Like costs, returns are both tangible and intangible. Clearly, in the context of foreign student recruitment, tangible benefits are paramount, i.e., the work is done for financial gain. The return to RSD in this case study is $1,896,650 paid by the clients/students in application and tuition fees.

		Students	Application fees	Program fees	Total
Enrollment	**September**	148	$29,600	$1,687,200	$1,716,800
	February	19	$3,800	$109,250	$113,050
Non-refundable deposits		334	$66,800		$66,800
			$100,200		**$1,896,650**

In addition, intangible returns include the residual benefits to other IE endeavors. Some of the intangible returns include increased international knowledge and skill development for students and teachers in Richmond classrooms, and relationship building for future business and sales development.

ROI for Foreign Student Recruitment IE Sample

ROI analysis is an accounting-based method of comparing the costs of training to the benefits. It requires that tangible costs and benefits be converted to dollar values. In the case of foreign student recruitment, ROI addresses the question: "For every dollar invested in foreign student recruitment, how many dollars does the school district get back?" ROI is expressed as a percentage generated through this formula: Foreign Student Recruitment Benefits / International Student Program Costs X 100 = ROI. **On this basis, the Return on Investment in foreign student recruitment, to RSD, is 185% per year** ($1,896,650 / $1,023,903 x 100). For each dollar spent on the recruitment and serving of foreign students, RSD accrues a return of $1.85 in purely financial gain.

Case Study Issues

From this case study, two issues emerge. The first issue is various ways to increase ROI that RSD has employed. One is the intangible value of a "good reputation" - the value of being a safe place for students, a venue with all amenities and proximity to the Asia Pacific, a place where relatives already live. The second issue is the increased ROI inherent in the RSD policy of recruiting only students with a high probability of academic and social success. RSD does not have to spend additional funds on programs for special needs or problem students. The second issue, then, is the value of taking a very pragmatic, business approach to IE if financial gain is the goal. It is important to note that the funds generated are used to enhance programs for all RSD students.

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Additional ROI Information

A thumbnail sketch of ROI in education/training would start with typical program development and delivery costs, for institutions and others who provide for teaching/learning systems, which might fall into these general categories:

- course/curriculum development or purchase;
- instructional materials;
- equipment and hardware;
- facilities;
- marketing or promotions;
- evaluation;
- salary (instructor and support staff); and
- administrative costs.

Students make direct and indirect investments of time, money and energy. Society makes similar direct and indirect investments.

In a review of the economic impact of international education in BC's public post-secondary sector,[50] the BCCIE concluded that the presence of international students in BC results in:

- involvement of some of the best and brightest international scholars in research and development at BC institutions, primarily at the graduate level;
- long-term business contacts, networks and personal friendships between international students, their former classmates, teachers and work experience sponsors;
- familiarity with Canadian companies, technology, equipment and practices of international students who later assume positions of leadership and responsibility in their own countries;
- substantial donations to BC institutions from foreign institutions and alumni.

As part of that study, the University College of the Cariboo concluded that international students generate revenue in the areas of:

- fees to the institution,
- travel,
- tourism (e.g., family/friends coming to visit international students),
- employment (inside the institution and within city, e.g. restaurants, stores),
- general retail (goods and services in the community), and
- revenue to Canada (i.e., the domino effect created when students buy items; also multiplier effect across Canada, as many purchases are made outside city).

[50] *The Economic Impact of International Education in Canada and British Columbia* (BCCIE, 2000) at http://www.bccie.bc.ca/bccie/FSA/NewsViews/Winter2000.pdf

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