Estimation of financial returns on investment in bridging education in pharmacy

ZUBIN AUSTIN[1], J. CRAIG MARTIN[2] & PAUL A. M. GREGORY[2]

[1]*Leslie Dan Faculty of Pharmacy, Ontario College of Pharmacists, University of Toronto, Toronto, Ont., Canada, and*
[2]*Leslie Dan Faculty of Pharmacy, University of Toronto, Toronto, Ont., Canada*

Abstract

Background: Determining financial value of educational programs is an important vehicle for demonstrating accountability and responsibility to stakeholders. Several methods of estimating financial value and economic impact of educational programs have been proposed, including the throughput value model, the benefit cost ratio (BCR), and the return on investment (ROI) model.

Objectives: To estimate the financial value of a bridging education program for internationally educated pharmacists seeking licensure in Canada.

Methods: Three separate studies were undertaken utilizing the Throughput Value Model, the BCR and the ROI model.

Results: All three models estimated positive benefits for students involved in bridging education in pharmacy. The Throughput Value Model estimated positive in each of years 1, 5 and 15, following completion of the program. The BCR model and the ROI models both estimated values of greater than 1, indicating positive financial returns from bridging education in pharmacy.

Conclusions: While certain methodological limitations are inherent in estimating financial value of educational programs, all three studies were positive, highlighting the economic importance of bridging education. While financial value is one measure of success, other humanistic and social justice outcomes must also be considered when evaluating overall objectives of any educational program.

Keywords: *Program evaluation, educational administration, International Pharmacy Graduates, internationally educated professionals*

Background and introduction

There is an abundance of program evaluation literature outlining methods for measuring "value" of educational programs from a variety of perspectives (Phillips, 1996; Weeks & Wallace, 2002; White & Bathshaw, 2005). However, as stated by DeSilets and Pinkerton (2004), "(i)t is usually easy to justify the value of a program as far as impact on patient outcomes or improved skills or staff competencies, but that is not the way the question about "value" is (usually) asked. The question is usually directed to the *financial* return to the investment in education".

The need to determine financial returns on investments in education has arisen within the context of the International Pharmacy Graduate (IPG) Program.

As described previously, the IPG Program is a bridging education program aimed at internationally- educated pharmacists seeking licensure in Canada (Austin & Dean, 2004). Bridging education has been described as a systematic curricular intervention aimed at individuals already licensed or eligible to practice a regulated profession or skilled trade in one jurisdiction who are seeking licensure or eligibility to practice in another (Austin & Dean, 2006). The stories of such individuals are well known and well publicized—well educated and well qualified in their home countries, these individuals have sacrificed financial and personal opportunities in order to immigrate and may face structural barriers when attempting to enter highly regulated professional fields such as pharmacy.

Correspondence: Z. Austin, Leslie Dan Faculty of Pharmacy, 144 College Street, Toronto, Ont., Canada M5S 3M2. Tel: 1 416 978 0186. Fax: 1 416 978 8511. E-mail: zubin.austin@utoronto.ca

An IPG Program model was developed that included prior learning assessment, curriculum (teaching and assessment) benchmarked to University of Toronto standards, a mentorship program, and distance learning opportunities. Over time, the program has evolved into a highly structured 16-week series of classes, laboratories and workshops, and an additional 6-week structured introduction to the Canadian pharmacy workplace. Program outcomes have been previously described; over 90% of those who successfully complete all program components go on to become licensed and employed at a level commensurate with their professional designation (Austin & Dean, 2006). While no published reports have indicated success rates for those who do not complete the program, it is estimated that less than 30% of these foreign-trained pharmacists are able to pass the licensing examinations within the first year without support from the bridging program.

Several methods for assessing financial value of educational programs have been described (Fagerlund, 1998; US Department of Labor, 2000; Edwards, 2001). In general, these methods are variations on two standard microeconomic measurement tools, the benefit-cost ratio (BCR), and the return on investment (ROI). Much of the literature utilizing financial value calculations assumes that the education program is being evaluated solely or mainly from the viewpoint of an employer's rate of return; there is no literature focusing specifically on programs where a participant is attempting to gain accreditation in a professional field (De Silets & Pinkerton, 2004). In addition, attempts to financially quantify certain social goods (such as employability, increased efficiency, decreased risk of errors made by a well-trained professional to society as a whole, etc.) can be particularly vexatious and controversial. Nonetheless, as stated by Hough (1994), "...the social rate of return should be important for educational planning since it gives the returns to society as a whole". Hough further notes that single estimates of financial returns may not be as useful as providing multiple estimates utilizing different models and perspectives, resulting in a range of financial return projections rather than a simple figure. Since each model emphasizes different elements of financial returns, such a range of projections is expected when comparing financial value projections.

Within the context of pharmacy education, there have been several attempts to quantify economic returns on investments. In particular, Cox, Reeder, and Cohn (1994) have estimated financial returns from the two year post-BS Pharm D degree in the US using the internal rate of return (IRR) method, which is methodologically similar to the ROI approach, and have noted positive (albeit relatively low) IRRs for those pursing a post-baccalaureate Pharm D. However, they also note that non-monetary benefits (such as employment satisfaction, and practicing at a level commensurate with professional skills and abilities) represent real though unquantified returns on educational investment.

Despite these methodological caveats, the question of financial value of education programs in general, and bridging programs in pharmacy in particular, are of specific interest given the money, time, and interest governments, employers, and students invest in such programs.

Objective

The objective of this research was to estimate the financial value of bridging education in pharmacy in Ontario, Canada, using a multiple stakeholder analytical method. For the purposes of this research, candidates for licensure (i.e. individuals who had enrolled in the bridging education program in pharmacy) were defined as the principal beneficiaries of the educational program. However, since funding for this program was provided through government, financial value for this investment was also considered from the funder's perspective, and costs for development of the program were accounted for in all calculations.

Methodologies

As discussed previously, there are no definitive models for calculation of financial value of bridging education programs such as the IPG program. As a result, estimations are most frequently utilized, each of which is premised upon different assumptions and requires different data from completion. In presenting and comparing three different estimates, we seek to contrast the impact of different assumptions and perspectives on "financial value". As DeSilets and Pinkerton (2004) have noted, no single formula can adequately capture "value"; consequently, use of multiple approaches can provide an important continuum along which to interpret financial benefit.

Table I provides a listing of various data elements utilized in these financial calculations, based on previously cited literature (Alboim, 2002, 2003; Austin & Dean, 2004, 2006).

Study A: Throughput value model

The throughput value model has not been formally described in the educational literature, and we present it here as a "common-sense" approach to quantification of financial value from the individual's perspective that builds upon work by Fagerlund (1998); Phillips (1996) and Weeks and Wallace (2004). While none of these have explicitly developed a model comparing inputs to outcomes, this approach to estimation of financial value and economic impact

has been described by all. For the purposes of this study, we have developed a quantitative model for estimation of throughputs based on the inputs/outcomes process described by those previously cited.

This model requires measurement of a variable of interest prior to and after completion of the intervention. In this case, an appropriate variable of interest would be annual salaries of participants in the IPG program, recognizing concerns related to under-employment of well-skilled professionals that initially spawned the program. Throughputs may be generated in a time-series fashion, in order to determine, over a period of years, the short (i.e. 1-year), mid (i.e. 5-year) and long (i.e. 15-year) term benefit of educational programs. In calculating the throughput value of the program, costs for enrollment in the program may be either amortized over a reasonable period of time (3–5 years) or may be accounted for solely in the first year, thereby affecting short-term gain but enhancing long term gain. Since mid-long-term gains are of greater interest in bridging education, the decision was made to account for all education-related expenses in year one only. The throughput value model treats each individual separately, and provides a financial estimation of value to that individual, rather than to a group. As a result, this model incorporates "opportunity costs" associated with attendance at an educational program, in the form of income sacrificed in order to study.

While this model has the advantage of simplicity, it is somewhat incomplete. The model will under-estimate value as it does not account for "spin-off" benefits or multiplier effects (such as the economic gains in the community associated with higher purchasing power of individuals employed at a level commensurate with their education) nor does it factor inflation or increases in earnings over time. De Silets and Pinkerton (2004) suggest that such spin-off benefits may increase financial value by approximately 300%; however since they are highly variable and difficult to estimate, they have not been included in this model. The model will overestimate value as it does not account for start-up or capital costs in developing and initiating programs, and assumes that all such costs (as well as on-going program development costs) are embedded in c_{prog}. Since indirect costs are frequently difficult to estimate with accuracy, the throughput value model does not attempt to include them; instead, this model only includes variables of interest that are directly traceable to an individual student and are therefore readily accountable without any estimation or projection required. Whether the overestimations or underestimations inherent in this model eventually balance one another out is a matter of debate and will be a function of the specific context within which this model is applied. The throughput value model is presented in Figure 1.

Model 1: Throughput Value Equation

$$y_T = r[T\,(x_{post} - x_{pre}) - (c_{prog} + t(x_{pre}))]$$

Where:
y_T = financial value over T years
r = program success rate
T = years following completion of course of study
x_{post} = annual salary/wage following completion of program
x_{pre} = annual salary/wage prior to completion of program
c_{prog} = costs for attending program (i.e. tuition + academic costs)
$t(x_{pre})$ = opportunity cost of attending program
= time in program x annual salary/wage prior to completion of program

Model 2: Benefit Cost Ratio (BCR)

$$BCR_T = r[Benefits/Costs]$$

Where:
T = years following completion of course of study
r = program success rate

Model 3: Return on Investment (ROI)

ROI (%) = (net program benefits (i.e. benefits-costs)/program costs) x 100%

Figure 1. Models for evaluating financial returns on education.

Study B: Benefit cost ratio model

Though widely used in estimating financial value in a variety of domains such as banking or manufacturing, the BCR does not yield a specific dollar value as a final result, but instead provides a determination of program benefits in a comparative sense. BCR equal to 1 indicates benefits outweigh costs; in general, the higher the BCR, the greater relative benefit accrues to the individual, although the actual value of this greater benefit cannot be calculated using this method. The BCR model is presented in Figure 1.

The US Department of Labor (2000) has provided a guide for monetizing of benefits and costs for BCR. In the context of bridging education, the following are defined as monetizable costs, and therefore should be included in BCR calculations:

(a) Course development (including costs incurred from development training such as needs analysis, research, design and curriculum/assessment development)
(b) Instructional materials (including costs for any instructional materials such as workbooks, handouts, software, etc.)
(c) Facilities and Equipment (including computers, classroom training aids, lab costs, consumable supplies etc). In the event the instructional site is owned by another institution, an allocation of "fair usage" can be made.
(d) Salaries (including costs for instructors, consultants, teaching assistants, support staff, etc.)

As can be seen from this list, there are fixed (or non-scalable) costs (i.e. course development), step (or semi-scalable) costs (e.g. facilities and salaries) and variable (or scalable) costs (i.e. teaching assistants or

educational resources). Unlike the throughput value model, the BCR model does not explicitly incorporate opportunity costs associated with lost potential employment income during the training period; however, opportunity cost may be incorporated in this equation with only slight modification.

In the context of bridging education, the major benefit accrued to individual students is increased annual salary/wage. The US Department of Labor (2000) recognizes a variety of other monetizable benefits, including time savings, increased productivity, improved quality of output, and optimized personnel performance; however in this context it is not feasible to monetize nor reasonably estimate these benefits. Consequently, application of the BCR model in this case will likely underestimate the true financial value of the IPG Program since all possible benefits will not be accounted for, only direct financial benefits accruing to individual students.

Study C: The return on investment model

The ROI model expresses value in terms of percentages, and attempts to estimate both tangible and intangible costs of learning (Cox et al., 1994). As with the BCR method, costs and benefits must be monetized, and may be done so in a similar manner. Unlike the BCR, the ROI may include multipliers to account for non-tangible benefits (Cox et al., 1994; Munoz & Munoz, 2000). Sandhusen et al. (2004) has modeled use of ROIs in health professionals' education programs, examining value of a peri-operative nursing fellowship in Virginia, and has included improvements in workplace-based performance, and impact on organizational development as part of the equation. The bases for calculating non-tangible benefits within the context of the IPG program are difficult to accurately quantify, subject to legitimate criticism, and consequently, will not be utilized in this study. As a result, in using the ROI

model, strict financial benefits and costs were only included, thereby resulting in a likely underestimation of financial value calculated using this method.

As can be seen, the approach taken in each of the three studies cited above is deliberately conservative and cautious. While we recognize the impact of this will likely lead to underestimation of true financial value, we equally recognize that any assumptions made regarding intangible benefits, multiplier effects, or spin off benefits would be largely conjecture with little or no empirical basis. Consequently, the conservative estimation approach, while perhaps understating the value of the program, is arguably more defensible since it relies upon fewer assumptions and instead utilizes readily accountable financial variables.

In order to compare results from these studies with a baseline group, it will be important to consider those individuals who succeed in the licensing process without attending the bridging education program. While no published date exists, it is estimated that approximately 27.5% of internationally educated pharmacists who do not access bridging education successfully meet all licensing requirements within one year, as compared with approximately 73.5% of those who do attend the program. To account for this group who meet requirements without requiring bridging education, a "discount" factor may be applied to the 73.5% success rate (i.e. assuming 27.5% of the 73.5% who succeed would succeed without bridging education and removing them from the overall program success rate), resulting in a discounted program success rate of 53.3%.

Results

In applying the preceding equations, the values in Table I were utilized.

Results from each study will be presented using the 73.5% overall program success rate, as well as the

Table I.   Description of variables used in financial impact calculations.

Direct cost for attending program (i.e. tuition fees)	$13000.00
Number of students enrolled in program (2003–2005)	401
Average annual salary/wage of student prior to enrollment in the IPG Program	$24254.00
Average annual salary/wage of licensed pharmacist in Ontario (2005)	$77245.00
Program development costs (fixed, step, and variable) (all program development costs were supported through an unencumbered grant from the access to professions and trades unit of the ministry of training, colleges and universities of the Ontario government)	$1,900,000
Total full-time study period required for program (including orientation, programming, examinations, in-site placements)	24 weeks (0.46 years)
Licensure success rate for those who successfully complete all program requirements (25% of all program attendees)	90%
Licensure success rates for those who attend the program but do not successfully complete all program requirements (75% of all program attendees)	68%
Overall program success rate $(0.25 \times 0.90) + (0.75 \times 0.68) = 0.735$	73.5%
Licensure success rates for those who do not attend the program at all	~27.5%

53.3% discounted program success rate, to provide a comparison that includes those who may be able to meet licensing requirements without benefit of bridging education.

Study A results: Throughput value model

Using the throughput value model, and using the undiscounted program success rate of 73.5%, positive financial gains were estimated. One year following completion of the program, net financial benefit would be $y(1) = \$14{,}791$; 5 years following completion of the program $y(5) = \$227{,}475$; and 15 years following completion of the program, $y(15) = \$756{,}665$.

The throughput value model projects a linear growth over time to the financial value of bridging education. Of importance, this model predicts that, within one year, an individual has more than offset any costs associated with the program (including loss of income during the time of study and the tuition costs of the program itself) through increased income. Over time this effect increases in magnitude and in absolute dollars, as all the initial costs (including opportunity costs) are factored in year one only. Figures cited here are in today's dollars with no attempt to correct for inflation or deterioration of purchasing power. While it is possible to modify this equation to incorporate, for example, anticipated salary rises over a many-year period, these are not included here since such projections may serve to overestimate value of the program, and for the purposes of this study, conservative estimates were indicated.

It is important to note that a factor r (program success rate) is used in this model, despite the fact that the equation itself purports to measure financial value for an individual. While, strictly speaking, in this case r should therefore equal either 1 (for an individual who is successful) or 0 (for an individual who is not successful), we have chosen to utilize the program success rate of 73.5% across all candidates in order to equalize results.

To account for the estimated 27.5% of program participants who may have successfully passed all licensing requirements without accessing bridging education, a discounted r of 53.3% was also utilized, resulting in $y(1) = \$11{,}146$, $y(5) = \$195{,}222$ and $y(15) = \$596{,}445$.

Study B results: Benefit cost ratio

The BCR may be calculated either for an individual student in the course or for the group of all students taking the course. The general formula and approach described in the methods section and in Figure 1 must therefore be modified accordingly. For individual BCR calculations:

$$BCR(Ind) = r[Benefits(Ind)/Costs(Ind)]$$

where $r = 0.735$

$$Benefits(Ind) = Annual\,Post - Program\,Income$$
$$= \$77{,}245.00$$

$$Costs(Ind) = (Program\,costs + Opportunity\,Costs)$$
$$= (\$13{,}000 + 11{,}156.80)$$

Thus, BCR (Ind) = 2.35.

For aggregate, or group-based BCR calculations, it is permissible to incorporate program start-up, development, and capital costs, as these will be allocated across all members of the group. In this case,

$$BCR(Grp) = r[n(Benefits(Ind)/((n\,Costs(Ind))$$
$$+ CSU)$$

where $r = 0.735$

$$n = 401(number\,of\,candidates\,who\,have$$
$$enrolled\,in\,the\,program)$$

$$CSU = Start{-}up\,costs = \$1.9\,million$$

$$And\,Benefits(Ind)\,and\,Costs(Ind)\,are$$
$$as\,previously\,cited.$$

Thus, BCR (Grp) = 2.67.

Where program success rate (r) = 53.3%, the BCR (Ind) = 1.70 and BCR (Grp) = 1.98

Study C results: Return on investment

Like the BCR model, the ROI model may be calculated either for the individual or for the group as a whole. For this study, the same assumptions and financial variables were utilized as for Study B.

$$ROI(Ind) = (r(Benefits(Ind)$$
$$- Costs(Ind))/Costs(Ind) \times 100\%$$
$$= 161.5\%$$

$$For\,ROI(Grp) : r[n((Benefits(Ind)$$
$$- Costs(Ind))]/[n\,Costs(Ind) + CSU]$$
$$\times 100\% = 135.0\%$$

where program success (r) = 53.3% (discounted program success rate), ROI (Ind) = 129.2% and ROI (Grp) = 108.1%

Discussion

Educators, students, policy makers, and society as a whole have a vital interest in understanding financial returns on and value of educational programs. In an era of heightening accountability for outcomes and fiscal constraints, development of models and methods to accurately estimate financial returns on education need to be developed and applied in a variety of contexts.

As illustrated in this paper, most methods for evaluating financial return are limited to some degree, insofar as a variety of assumptions that underlie certain calculations may be difficult to estimate, verify or quantify. In this study, we decided to err on the side of caution and deliberately elected to underemphasize non-tangible benefits, thereby resulting in "low-ball" estimates, and to include estimations involving a "discounted" program success rate, based on the assumption that close to 30% of "successful" students would have met licensing requirements without benefit of accessing the program. Despite this, it is clear that bridging education provides significant societal value for a relatively small investment, given the results discussed previously. By utilizing three different methods for estimation, and comparing results, it is clear that bridging education in pharmacy provides significant financial dividends for students, funders, government and other stakeholders. The Throughput Value model provided the most clear and dramatic indication of financial value, particularly over a fifteen-year period. Both the BCR and the ROI methods were strongly positive. By way of comparison, there are few (legal) financial vehicles or personal investments that would provide ROI of between 108 and 165%.

There are, however, limitations that must be considered in evaluating these results. As discussed previously, methods for calculating financial value are imperfect, and consequently, the term "estimating financial value" is a more accurate representation of this work. By using multiple methods and comparing results, it is possible to estimate a range of values, rather than a discrete point value, and again, this is likely a more accurate representation. A significant limitation of this study has been the lack of attempt to quantify numerous intangible benefits (and costs) associated with bridging education. While the rationale for doing so has been previously explained, this still affects the validity of the overall estimations cited here.

The inability to accurately account for intangible benefits points to another important issue in using financial justifications for education programs. While we clearly now live in fiscally conservative times, where buzzwords such as "accountability" and "responsibility" are frequently applied to educational programs, it is a mistake to simply equate bottom-line financial performance with success in any education program. The IPG Program is fortunate, insofar as the estimates discussed here point to a financially robust and positive ROI for students, despite "low-balling" assumptions that have likely yielded under-estimated benefits. However, for another program in another context, these figures may be somewhat more equivocal.

Ultimately, accountability and outcomes clearly matter, and fiscal responsibility in management and delivery of educational programs is important. However, in some circumstances, education-for-education's sake, not for bottom-line benefits is also important. In the context of well-educated immigrants who have sacrificed much to move to a new country, only to face barriers to entering their profession or trade, social justice values must also be considered. Slavish adherence to financial indicators of success alone runs the risk of missing the true value of education; while many benefits (and costs) may be monetized and accounted for in formulae discussed here, these too are simply very crude estimates that do not adequately capture the real benefit of an educated, functional citizen in society.

Conclusions

Financial accountability should be of significant—albeit not overriding—interest to all educators. Understanding the uses and limitations of available models for estimating financial value of educational programs provides all stakeholders with an important source of information in providing overall assessment of the value of a program.

The unique context of bridging education provides an important case study for examining application of these estimation models. As discussed, from a financial perspective, and utilizing three different estimation models, bridging education is a financially viable and responsible option for accelerating integration of foreign-trained professionals into the domestic workforce.

References

Alboim, N. (2002). *Fulfilling the promise: Integrating immigrant skills into the Canadian economy*. Ottawa: Caledon Institute of Social Policy.

Austin, Z. (2003). Continuous professional development and foreign-trained health care professionals: Results of an educational needs assessment of international pharmacy graduates in Ontario (Canada). *Journal of Social and Administrative Pharmacy*, *20*(6), 232–241.

Austin, Z., & Dean, M. R. (2004). Bridging education in pharmacy: The International Pharmacy Graduate Program in Ontario, Canada. *American Journal of Pharmaceutical Education*, *68*(5), Article 108.

Austin, Z., & Dean, M. R. (2006). Bridging education in pharmacy: The International Pharmacy Graduate (IPG) Program in Canada. *Teaching in Higher Education*, *11*(1), 19–32.

Cox, E. R., Reeder, C. E., & Cohn, E. (1994). Estimation of the internal rate of return to the two year post-BS Pharm D degree. *American Journal of Pharmaceutical Education*, *58*(Spring), 1–8.

De Silets, L., & Pinkerton, S. E. (2004). The financial return on education programs. *Journal of Continuing Education in Nursing*, *35*(6), 244–245.

Edwards, G. B. (2001). Preventing the ax: Proving educational productivity and linking productivity to cost using the edvision methodology. *Journal of Nurses in Staff Development*, *17*(6), 294–302.

Fagerlund, K. A. (1998). An economic analysis of the investment in nurse anaesthesia education. *American Association of Nurse Anaesthetists Journal*, *66*(2), 37.

Hough, J. R. (1994). Educational cost-benefit analysis. *Education Economics*, *2*(2), 93–128.

Munoz, M., & Munoz, M. Evaluating training: Return on investment and cost benefit analysis, Accessed at http://www.eric.ed.gov/ERICDocs/data/ericdocs2/content_storage_01/0000000b/80/27/d9/60.pdf on August 29 2005.

Phillips, J. (1996). How much is training worth? *Training and Development*, *50*(4), 20–24.

Sandhusen, A., Rusynko, B., & Wethington, N. (2004). Return on investment for a perioperative nurse fellowship. *Association of Operating Nurses Journal.*, *80*(1), 73–81.

United States Department of Labor. (2000). Determining return on investment in training/education Workbook, Accessed at www.uned.es/catedraunesco-ead/publicued/pbc01/pbcII_1.htm on August 17 2005.

Weeks, W. B., & Wallace, A. E. (2002). The more things change: Revisiting a comparison of educational costs and incomes of physicians and other professionals. *Academic Medicine*, *77*(4), 312–319.

Weeks, W. B., & Wallace, A. E. (2004). Return on educational investment in geriatrics training. *Journal of the American Geriatrics Society*, *52*, 1940–1945.

White, P. H., & Bathshaw, M. L. (2005). Measuring returns on investment of an intensive faculty development program in medical education. *Journal of Pediatrics*, *147*, 133–134.