

DEMONSTRATING THE ECONOMIC VALUE OF

FE Colleges in Wales

EXECUTIVE SUMMARY

August 2017



ANALYSIS OF THE SOCIAL & ECONOMIC IMPACT OF LEARNING

 Emsi



INTRODUCTION

FE colleges in Wales create value in many ways. The colleges are committed to putting learners on the path to success and play a key role in helping them increase their employability and achieve their individual potential. With a vast range of courses and apprenticeships, the colleges' provision enables learners to acquire qualifications and develop the skills they need in order to have a fulfilling and prosperous career. The colleges also provide an excellent environment for learners to meet new people and make friends, while participation in the colleges' courses improves the learners' self-confidence and promotes their mental health. All of these social and employment-related benefits have a positive influence on the health and well-being of individuals.

However, the benefits of FE colleges in Wales consist of so much more than solely influencing the lives of learners. The colleges' provision supports a range of employment sectors in Wales. This provision supplies employers with the skilled workers they need to make their businesses more productive. The expenditure of FE colleges in Wales, along with the spending of their staff and learners, further supports the local economy through the output and employment generated by local suppliers. Lastly, and just as importantly, the economic impact of FE colleges in Wales extends as far as the Exchequer in terms of increased tax receipts

and decreased public sector costs.

In this report we aim to assess the economic benefits of FE colleges in Wales to their key stakeholder groups: learners, society, taxpayers, and the local community. The fact that learning makes a difference to these groups is well known, but comparatively little research has been done to quantify the monetary value of the impacts.

The approach in this study is twofold. We begin with a standard investment analysis to determine how the investments in FE colleges in Wales will perform for a given investor over time. The investors in this case are learners, society, and taxpayers, all of whom pay a certain amount in costs to support the learning activities at FE colleges in Wales. The learners' investment consists of their direct outlays, such as those for tuition fees and books, plus the opportunity cost of spending time learning opposed to earning income through employment. Society invests in learning by forgoing the services that it would have received had government not funded the colleges and the business output that it would have enjoyed had learners been employed instead of learning. Taxpayers contribute their investment through government funding via organisations such as the Welsh Government Education Directorate Core Funding. In return for these investments, learners receive a lifetime of higher earnings, society benefits

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from an expanded tax base and a reduced demand for social services, and taxpayers benefit from higher tax receipts and avoided public sector costs. To determine the feasibility of the investment, the model projects benefits into the future, discounts them back to their present value, and compares them to their present value costs. Results of the investment analysis for learners, society, and taxpayers are displayed in the following three ways: 1) net present value of benefits, 2) rate of return, and 3) benefit/cost ratio.

The second component of the study focuses on the economic impacts created by FE colleges in Wales on the local business community in Wales. Regional economic impact analysis is distinct from investment analysis in that it focuses on a single time period and does not project impacts into the future, nor does it factor in costs incurred by stakeholders. To derive results, we rely on a specialised input-output (IO) model to calculate the additional income created in the economy of Wales as a result of the increased consumer spending

and added skills generated by FE colleges in Wales and their learners. Results of the regional economic impact analysis are measured in terms of the added income created by the following three impacts: 1) impact of staff and college expenditure, 2) impact of learner expenditure, and 3) impact of the skills acquired by learners still active in the workforce of Wales.

Data and assumptions used in the study are based on several sources, including surveys collected from FE colleges in Wales, industry and employment data from Nomis official labour market statistics, demographic and earnings data from the Office for National Statistics (ONS), and Emsi's input-output model. The study applies a conservative methodology and follows standard practice using only the most recognised indicators of investment effectiveness and economic impact. For more information on the data used to derive the results, we encourage our readers to contact ColegauCymru-CollegesWales for full documentation of the study.

LIST OF PARTICIPATING INSTITUTIONS

Bridgend College
Coleg y Cymoedd
Coleg Sir Gar
Cardiff and Vale College
Coleg Cambria
Workers Education Association Cymru*
YMCA Wales Community College*
Gower College Swansea
Pembrokeshire College
NPTC Group of Colleges
The College Merthyr Tydfil
Coleg Gwent
Grŵp Llandrillo Menai
Data Unavailable for the Following Institutions:
Coleg Ceredigion
St David's Catholic Sixth Form College

*These institutions have since merged to become Adult Learning Wales



STUDY HIGHLIGHTS

The results of this study show that FE colleges in Wales create significant positive benefits for their main stakeholder groups: learners, society, taxpayers, and the local business community. Using a two-pronged approach that involves an investment analysis and a regional economic impact analysis, we calculate the benefits to each of these groups. Key findings of the study are as follows:

INVESTMENT ANALYSIS

BENEFITS TO LEARNERS

- Learners as a whole paid a total of **£66.9 million** to cover the cost of tuition fees and books and supplies at FE colleges in Wales in 2014-15. All learners also forewent **£732.7 million** in earnings that they would have generated had they been working instead of learning.
- In return for the monies that learners invest in FE colleges in Wales, they will receive a present value of **£5.5 billion** in increased earnings over their working lives.
- Every £1 that learners pay for their education at FE colleges in Wales yields **£6.90** in higher future wages. This translates to a **20.8%** annual rate of return.

BENEFITS TO SOCIETY

- Society as a whole invested **£1.7 billion** in FE colleges in Wales through direct outlays and the loss of potential output from learners who spent time at the colleges rather than working.
- In return, society in the UK will receive a present value of **£13.3 billion** over the course of the learners' working lives, in the form of an expanded tax base and a variety of

social benefits related to lower unemployment, increased health and well-being, and reduced crime.

- Society will receive **£7.90** in benefits in return for every £1 invested in FE colleges in Wales. The average annual rate of return on investment is **24.0%**.

BENEFITS TO TAXPAYERS

- Taxpayers in the UK paid **£374 million** to support the operations of FE colleges in Wales in 2014-15.
- The net present value of the added tax revenue stemming from the learners' higher lifetime incomes and the increased output of businesses amounts to **£2.3 billion** in benefits to taxpayers. Avoided costs to the public sector adds another **£86.3 million** in benefits due to a reduced demand for government-funded social services in the UK.
- Taxpayers see an average annual rate of return of **20.4%** from their investment in FE colleges in Wales. The corresponding benefit-cost ratio is **£6.30** in benefits returned for every £1 in costs.

REGIONAL ECONOMIC IMPACT ANALYSIS

IMPACT OF STAFF AND COLLEGE EXPENDITURE

- FE colleges in Wales employed **8,115** full-time, part-time, and agency staff in 2014-15. Staff costs amounted to **£305.2 million**, much of which was spent in Wales to purchase groceries, clothing, and other household goods and services.
- The colleges are buyers of goods and services and spent **£163.1 million** to support their operations in 2014-15. This expenditure further benefited many local suppliers in Wales.
- The net impact of staff and college expenditure in Wales comes to approximately **£455.5 million** in added income in the national economy each year.

IMPACT OF LEARNER EXPENDITURE

- Learners from FE colleges in Wales who relocate to Wales from outside of the area spend money at local shops to buy books and supplies, purchase groceries, rent accommodation, pay for transport, attend sporting events, etc.
- The expenditure of learners from outside of Wales attending FE colleges in Wales annually adds approximately **£5.1 million** in income to the economy of Wales.

IMPACT OF ADDED WORKFORCE SKILLS

- Many FE colleges in Wales learners stay in Wales after attending the institutions. Their enhanced skills and abilities bolster the output of local employers, leading to higher national income and a more robust economy.
- The accumulated impact of former FE colleges in Wales learners who are currently employed in the national workforce amounts to **£3.5 billion** in added income to the economy of Wales.

TOTAL IMPACT ON LOCAL BUSINESS COMMUNITY

- Altogether, the economic impact of FE colleges in Wales to the local business community in Wales is **£4 billion** each year.
- Total added income created by the colleges and their learners is equal to **9.1%** of the total economic output of Wales and represents roughly **183,530** average wage jobs.

METHODOLOGY & RESULTS

FE colleges in Wales generate a wide array of benefits. Learners benefit from higher lifetime earnings, society and taxpayers benefit from an expanded tax base and avoided social costs, and the local business community benefits from increased consumer spending and higher skill levels in the workforce. In this study, FE colleges in Wales investigate the benefits they create to each of their main stakeholder groups, i.e., learners, society, taxpayers, and the local business community. The following two analyses are presented: 1) investment analysis, and 2) regional economic impact analysis. Benefits to learners, society, and taxpayers fall under the investment analysis, and benefits to the local business community fall under the regional economic impact analysis. The methodology and results for both of these analyses are described more fully below.

INVESTMENT ANALYSIS

Investment analysis is the process of evaluating total costs and measuring these against total benefits to determine whether or not a proposed venture will be profitable. If benefits outweigh costs, then the investment is worthwhile. If costs outweigh benefits, then the investment will lose money and is thus considered unprofitable. In this section, we consider FE colleges in Wales as an investment from the perspectives of learners, society, and taxpayers. The backdrop for the analysis is the entire UK economy.

Benefits to Learners

In 2014-15, FE colleges in Wales served 151,244 unique learners across various qualifications and levels. Table 1 shows the breakdown of enrolments at FE colleges in Wales by education level, beginning with entry level up through greater than Level 3. As indicated, the bulk of

the colleges' provision was at Level 2 and Level 3, with each comprising 32% of enrolments.

In order to attend the colleges and depending on their level of funding, learners at FE colleges in Wales pay money to cover the cost of tuition fees and purchase books and supplies. All learners also forgo earnings that they would have generated had they been working instead of learning. Together these two cost factors comprise the learners' total investment in their education at FE colleges in Wales, equal to £799.6 million in 2014-15 (the sum of £66.9 million in tuition fees, books, and supplies and £732.7 million in forgone earnings). This translates to an average cost of £5,287 per learner, the bulk of which comprises the opportunity cost of

TABLE 1. Breakdown of enrolments at FE colleges in Wales, 2014-15

EDUCATION LEVEL	%
Entry Level	11%
Level 1	23%
Level 2	32%
Level 3	32%
> Level 3	1%
Total	100%

Source: Data supplied by FE colleges in Wales.

FIGURE 1. Unemployment rate and average annual earnings by education level received by individuals in Wales at the midpoint of their career



spending time learning rather than working.

In return for the costs of education, learners receive a stream of higher future earnings that continues to grow throughout their working lives. As shown in Figure 1, mean income levels received by average-aged workers at the midpoint of their career increase as individuals attain higher levels of education. Employment prospects also increase, so unemployment levels decrease as learners gain higher education levels. Table 2 shows the average lifetime earnings that learners can expect to receive at each education level.

The marginal differences between education levels form the basis for determining the earnings benefits that accrue to learners in return for their education investment. For example, the average Level 3 achiever from FE colleges in Wales will see an increase in earnings of £2,686 each year compared to someone with Level 2 qualifications. This amounts to a present value of approximately £118,175 in higher earnings over a working lifetime.

To calculate the learners' return on investment, we use the differences in wages to attach a monetary value to the learners' achievement level at FE colleges in Wales in 2014-15. We then project this earnings increase into the future over the course of the learners' working career by applying the well-known human capital earnings function developed by Jacob Mincer, where earnings gradually increase from the time learners enter the workforce, come to a peak shortly after the career midpoint, and then dampen slightly as learners approach retirement. The result is a stream of projected future

TABLE 2. Average lifetime earnings by education level received in Wales, undiscounted

EDUCATION LEVEL	EARNINGS	DIFFERENCE
< Entry level	£555,448	n/a
Entry	£605,994	£50,546
Level 1	£930,300	£324,306
Level 2	£1,016,068	£85,768
Level 3	£1,134,243	£118,175
> Level 3	£1,259,555	£125,312

Source: Derived from data supplied by ONS. Figures are weighted according to the specific gender and ethnicity profile of the FE colleges in Wales learner population.

TABLE 3. Present value of benefits and costs, learner perspective (£ thousands)

A. Present value of future earnings stream	£5,539,181
B. Present value of learner costs	£799,644
Net present value (A – B)	£4,739,537
Benefit/cost ratio (A / B)	6.9
Rate of return	20.8%

Source: Emsi.

benefits tailored to the learners' specific achievement levels at FE colleges in Wales.

The final step is to discount the stream of future earnings to the present in order to account for the time value of money. For the learner perspective we assume a discount rate of 3.5%. The present value of the benefits is then compared to the costs that learners pay for their education (i.e., tuition fees and forgone earnings) to derive the investment analysis results, expressed in terms of a net present value, benefit/cost ratio, and rate of return. Results appear in Table 3.

As shown in the table, the present value of the higher future earnings that accrue to learners yields a cumulative sum of £5.5 billion. Costs are provided in the second row of Table 3, equal to £799.6 million, which includes tuition fees, books and supplies, and the opportunity cost of time. By dividing the £5.5 billion in benefits by the £799.6 million in costs, we derive a benefit-cost ratio of 6.9. This means that, for every £1 learners invest at FE colleges in Wales in the form of tuition fees and forgone earnings, they will receive a cumulative £6.90 in higher future earnings over the course of their working life. Recall that the bulk of the learners' investment comprises their opportunity cost, so even if they spend little to no money on tuition fees, this does not necessarily mean that their returns will also have a correspondingly small value.

The rate of return is perhaps the most recognised indicator of investment effectiveness. Given the cost of education and the stream of associated future benefits, the rate of return indicates how much a bank would have to pay a depositor of like amount to yield an equally rewarding stream of future payments. Table 3 shows FE colleges in Wales learners earning an average annual rate of return of 20.8% on their investment of time and money. This is an impressive return compared, for example, to the less than 0.9% return per annum that can be expected from saving money in today's Individual Savings Accounts (ISAs).

Benefits to Society

FE colleges in Wales are in many ways social enterprises. They aim to improve the lives of young people and adults by increasing their employability and raising their individual potential. They help to create shared wealth in the UK economy through the higher incomes of learners and the increased output of businesses. Further, they tackle social problems such as unemployment, poor lifestyle habits by positively influencing the health and well-being of their learners, and crime.

From the perspective of society, the social value created by FE colleges in Wales takes on two forms. The

first and largest component is the added income created in the UK. As discussed in the previous section, learners earn more because of the skills and qualifications they acquire while attending FE colleges in Wales. Businesses also earn more because the enhanced skills of learners make capital more productive (i.e., buildings, machinery, and everything else). This in turn raises profits and other business property income throughout the national economy. Together, increases in earnings and business output stimulate corresponding increases in value added, thereby raising prosperity in the UK and expanding the tax base for society as a whole.

The social value of FE colleges in Wales also consists of the savings that accrue to society through the improved lifestyles of learners. Learning is statistically correlated with a variety of life changes that generate social savings in three main categories: 1) health, 2) crime, and 3) unemployment. Health savings include avoided medical costs associated with smoking, obesity, and mental health problems. Crime savings consist of reduced security expenditure and insurance administration, lower victim costs, and reduced Criminal Justice System expenditures. Unemployment savings comprise the reduced demand for income assistance and Jobseeker's Allowance benefits. By combining data sets that relate learning to improved social behaviour, we are able to quantify how education contributes to the lowering of social costs and ultimately improves quality of life.

Table 4 shows the present value of the added income and social savings that occur in the UK over the working lifetime of learners from FE colleges in Wales. As shown, added income amounts to a present value of £13.2 billion, due to the increased lifetime earnings of learners and associated increases in business output. Social savings amount to £164.3 million, the sum of health, crime, and unemployment savings in the UK (see also Figure 2). Altogether, the total social value of FE colleges in Wales is £13.3 billion. Note that the figures in Table 4 have been adjusted to account for counterfactual outcomes where FE colleges in Wales do not exist.

In order to calculate society's return on investment, we must first determine what it cost society to support FE colleges in Wales during the reporting year. Costs to society break down into two main categories: direct outlays and opportunity costs. Direct outlays simply refer to operating and non-operating revenues of FE colleges in Wales, equal to £470.9 million in 2014-15. Opportunity costs refer to the loss of earnings and output that would have been generated in the UK economy had learners chosen to work full-time rather than learning. Opportunity costs also include the government services that would have been undertaken

TABLE 4. Present value of added income and social savings that accrue to society (£ thousands)

	TOTAL
ADDED INCOME	
Increased income in the UK	£13,173,927
SOCIAL SAVINGS	
Health savings [†]	£57,909
Crime savings	£93,695
Unemployment savings [‡]	£12,677
Total	£13,338,207

[†] Includes savings from reduced smoking, obesity, and mental health problems.

[‡] Includes savings from a reduced number of JSA claimants.

Numbers may not add due to rounding.

Source: Emsi.

FIGURE 2. Present value health, crime, and unemployment savings to society (£ thousands)

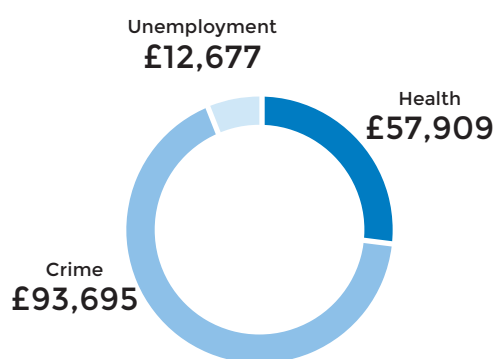


TABLE 5. Present value of benefits and costs, social perspective (£ thousands)

A. Present value of social benefits	£13,338,207
B. Present value of social costs	£1,690,289
Net present value (A - B)	£11,647,918
Benefit/cost ratio (A / B)	7.9
Rate of return	24.0%

Source: Emsi.

had taxes been collected on the incomes that learners forgo. Together direct outlays and opportunity costs equal £1.7 billion in costs to society during the reporting year.

Table 5 shows the investment analysis results. In return for the £1.7 billion that society invests in FE colleges in Wales, it receives a net gain (in present value terms) of £11.6 billion. The associated benefit-cost ratio is 7.9 for every £1 spent, and the average return on investment is 24.0% annually.

Benefits to Taxpayers

Benefits and costs under the taxpayer perspective only look at the monetary gains and losses that accrue to the

public sector as a result of FE colleges in Wales. Learners earn more, which means they make higher income tax payments and National Insurance contributions. The portion of their higher earnings that learners spend also leads to higher value added tax (VAT) receipts. Further, as employers increase their output and make more purchases for supplies and services, they benefit the Exchequer through their higher corporation tax and VAT payments. Altogether, the present value of the added tax receipts that accrues to taxpayers amounts to £2.3 billion.

A portion of the social savings enjoyed by society also accrues strictly to taxpayers. As learners become more employable, the demand for Jobseekers' Allowance benefits reduces. Learners put less of a demand on the National Health Service (NHS) for medical treatment as a result of their improved health habits. Further, the reduced probability that learners will commit criminal offences leads to a reduced demand on the Criminal Justice System for law enforcement services. Figure 3 illustrates in present value terms how the £164.3 million in health, crime, and unemployment savings to society translates to £86.3 million in savings to taxpayers. These represent the monies that taxpayers do not have to spend as a result of the reduced demand for government-supported social services.

Summing the present value of the added tax revenues and savings to taxpayers yields £2.4 billion (net of the same counterfactual adjustment applied to the social

perspective). This value appears in the top row of Table 6. Also shown in the table are the costs to taxpayers, equal to £374 million. These represent the total funding received by FE colleges in Wales from taxpayers in 2014-15.

By comparing taxpayer costs to the £2.4 billion in benefits, we derive a benefit/cost ratio of 6.3. This means that for every £1 of public money invested in FE colleges in Wales, taxpayers receive a cumulative value of £6.30 over the course of the learners' working lives. This translates to a 20.4% annual return on investment to taxpayers for their support of FE colleges in Wales, again a solid investment that compares favourably with other long-term investments in both the private and public sectors.

REGIONAL ECONOMIC IMPACT ANALYSIS

FE colleges in Wales promote economic growth in Wales in a variety of ways. The colleges are employers and buyers of goods and services, while the living expenses of learners from outside of Wales benefit local businesses. In addition, FE colleges in Wales are a primary source of education to local residents and a supplier of trained workers to local industry.

In this section we examine the economic impacts of FE colleges in Wales on the local business community through the increased consumer spending and enhanced business productivity generated by the colleges and their learners. The impacts reflect the economic relationships among industries in Wales and are calculated using Emsi's proprietary input-output (IO) model. The model places particular reference on how much each industry purchases from other industries using data from the Office for National Statistics' (ONS) Supply and Use Tables (SUTs), as well as regional and national industry jobs totals and national sales-to-jobs ratios. The results are then expressed in terms of income (as opposed to sales) in order to present a more accurate picture of the colleges' actual impacts by accounting for monies that leave the economy.

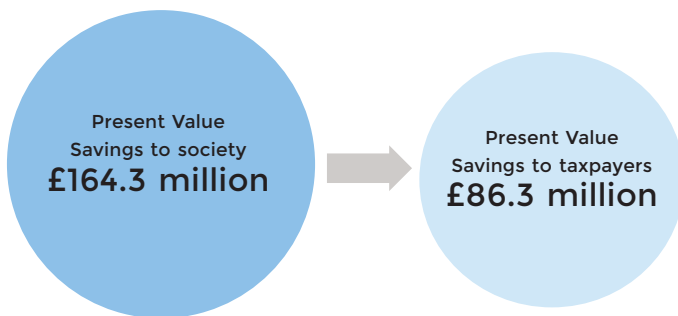
The following pages present the results of the analysis broken down according to the following three impacts: 1) impact of staff and college expenditure, 2) impact of the expenditure of learners who relocate to Wales to attend the colleges, and 3) impact of the added skills of former FE colleges in Wales learners who are still employed in the workforce of Wales.

TABLE 6. Present value of benefits and costs, taxpayer perspective (£ thousands)

A. Present value of taxpayer benefits	£2,359,559
B. Present value of taxpayer costs	£374,025
Net present value (A – B)	£1,985,534
Benefit/cost ratio (A / B)	6.3
Rate of return	20.4%

Source: Emsi.

FIGURE 3. Present value savings to society and associated savings to taxpayers



Impact of Staff and College Expenditure

FE colleges in Wales are important employers in Wales, providing jobs for a wide range of staff across a number of occupations. In 2014-15, the colleges employed 8,115 full-time, part-time, and agency staff. Of these, approximately 98% were residents of Wales. Total staff costs at FE colleges in Wales in 2014-15 amounted to £305.2 million, which became part of the overall income in Wales. Staff expenditure on groceries, eating out, clothing, and other household costs also helped support local shops and businesses.

In addition to their staff, FE colleges in Wales are large-scale buyers of goods and services. In 2014-15, the colleges spent £163.1 million to support their operations. Much of this expenditure benefited local suppliers in Wales, creating a knock-on multiplier effect that generated additional employment and income throughout the national economy.

The impact of payroll and purchases at FE colleges in Wales is subdivided into the following four effects: the initial, direct, indirect, and induced effects. The initial effect comprises the colleges' payroll and employee benefits. The direct effect refers to the additional economic activity that occurs as the industries initially effected spend money. The indirect effect occurs as the supply chain of the initial industries creates even more activity in the economy through their own interindustry spending. Finally, the induced effect refers to the economic activity created by the household sector as the businesses affected by the initial, direct, and indirect effects raise salaries and hire more people.

To calculate the multiplier effects, we remove any expenditures that occur outside of Wales and map the remainder to the 563 industry sectors of the IO model. We then run the data through the model's multiplier matrix to estimate how the spending of the colleges and staff affects the output of other industries in the area. Finally, we convert the sales figures to income by means of value added-to-sales ratios, also provided by the IO model. Table 7 shows the results, a total of £478 million in gross impacts attributable to the initial effect of staff costs plus the direct, indirect, and induced effects that occur as the colleges and their staff spend money in Wales.

One adjustment must be made to the gross impact before deriving the net impact of staff and college expenditure. FE colleges in Wales received an estimated 14.7% of funding from local sources in Wales, whether from local residents (in the form of tuition fees) or from other private and public sources located in the region. Given this phenomenon, a portion of the income that the colleges create in the Welsh economy is offset by

the income that they withdraw from the economy. As such, not all of the impacts generated by FE colleges in Wales and their staff can be considered new monies brought to Wales.

To determine the 'net' impact of FE colleges in Wales payroll and purchases, we take the estimated portion of funding that originated from local sources and convert it to spending. We then bridge the spending figures to the individual sectors of the IO model, calculate the multiplier effect, and convert the amounts to income. The result, equal to £22.5 million, allows us to see what income would have been created in Wales anyway, even if FE colleges in Wales did not exist.

Subtracting the £22.5 million in alternative uses of funds from the £478 million in gross impacts yields a net impact of £455.5 million in added income in the national economy. This value appears in the bottom row of Table 7. Assuming that FE colleges in Wales employ approximately the same number of people and spend approximately the same amount each year, this value may be considered an annual figure.

TABLE 7. Impact of staff and college expenditure (£ thousands)

	TOTAL
Total income in the region	£43,768,808,102
Initial effect of staff costs	£305,190
Direct effect	£51,865
Indirect effect	£13,948
Induced effect	£106,984
Gross total impact	£477,988
Alternative use of funds adjustment	-£22,459
Net total impact	£455,529

Source: Emsi.

Numbers may not add due to rounding.

Impact of Learner Expenditure

Learners who relocate to Wales to attend FE colleges in Wales spend money at local shops to buy books and supplies, purchase groceries, rent accommodation, pay for transport, attend sporting events, and so on. The expenditures of learners from outside Wales attending FE colleges in Wales support local suppliers and create multiplier effects, thereby generating income and a need for further jobs.

In order to calculate the multiplier effects of learners from outside of Wales, we begin by estimating their gross expenditure in 2014-15, a total of £8.7 million. Note that we exclude the expenses of in-commuters since they spend little in the region compared to those who live in Wales. The initial income effect is £0, as seen in table 8, because the impact of learners from outside of Wales only occurs when they spend part of their earnings to make a purchase at a local business.

The multiplier effects therefore account for the entire non-local learner spending impact. We map the £8.7 million in sales to the industry sectors in the IO model, adjusting them to account for leakage, and converting them to income by applying value added-to-sales ratios.

The multiplier effects comprise the additional income created as businesses are patronized by learners and businesses that benefit from the colleges' non-local learners also spend money in Wales. Summing together the direct, indirect, and induced effects we estimate that the spending of out-of-region learners attending FE colleges in Wales annually adds approximately £5.1 million in income to the economy of Wales. Since we are capturing the impacts of only those learners who relocate to Wales (thereby injecting new monies into the economy of Wales), we do not have to adjust for the alternative use of funds as we did for the staff and college expenditure in the previous section. All of the results leading to this impact are presented in Table 8:

TABLE 8. Impact of expenditure of learners from outside Wales (£ thousands)

	TOTAL
Total income in the region	£43,768,808,102
Initial effect of learner expenditure	£0
Direct effect	£3,575
Indirect effect	£873
Induced effect	£677
Total impact	£5,124

Source: Emsi.
Numbers may not add due to rounding.

Impact of Added Workforce Skills

The strong focus of FE colleges in Wales on workforce development manifests itself at all levels of the colleges' provision. In addition to delivering specific training and consultancy solutions to businesses, the colleges maintain close links with local employers in order to target the type of employee training that best meets their growth strategies. Further, the colleges' vocational learning programmes and apprenticeships allow employers and the colleges to work together to develop industry-specific training schemes that benefit both the learners and employers. All of these services provide valuable resources to businesses and help develop the skills of the existing Welsh labour force.

Employee training and development is just one way that employers benefit from the presence of FE colleges in Wales. By aligning their provision with key employment sectors in the nation, FE colleges in Wales help produce the skilled workers that are needed to support the labour market of Wales. Table 9 presents the percentage breakdown of FE colleges in Wales instructional activity by top-level subject sector categories, based on the

colleges' enrolments. Preparation for Life and Work comprises the highest percentage of activity (28%), followed by Health, Public Services and Care (13%) and Engineering and Manufacturing Technologies (9%).

TABLE 9. FE colleges in Wales breakdown of instructional activity by subject sector

SECTOR SUBJECT AREA	% OF TOTAL
Preparation for Life and Work	28%
Health, Public Services and Care	13%
Engineering and Manufacturing Technologies	9%
Arts, Media and Publishing	8%
Construction, Planning and the Built Environment	7%
Business, Administration and Law	7%
Retail and Commercial Enterprise	6%
Information and Communication Technology	4%
Science and Mathematics	4%
Leisure, Travel and Tourism	4%
Languages, Literature and Culture	3%
Agriculture, Horticulture and Animal Care	2%
Education and Training	2%
Social Sciences	1%
History, Philosophy and Theology	1%
Total	100%

Source: Data supplied by FE colleges in Wales.
Numbers may not add due to rounding.

Many FE colleges in Wales learners stay in Wales and are more productive because of the quality education they invested in at the colleges. Over time, the skills of former FE colleges in Wales learners accumulate, steadily increasing the training level and experience of the workforce of Wales. As the skills embodied by former learners stockpile, a chain reaction occurs in which higher learner incomes generate additional rounds of consumer spending, while new skills and training translate to increased business output and higher property income, causing still more consumer purchases and regional multiplier effects. The sum of the initial and multiplier effects comprises the total impact of the learners' added skills in the economy of Wales.

Assigning a monetary value to the added skills acquired by learners that are still active in the workforce

TABLE 10. Impact of added workforce skills (£ thousands)

	TOTAL
Total income in the region	£43,768,808,102
Initial effect of added workforce skills	£2,445,834
Direct effect	£467,060
Indirect effect	£153,496
Induced effect	£467,150
Total impact	£3,533,539

Source: Emsi.
Numbers may not add due to rounding.

of Wales requires data on the historical enrolments and corresponding achievement levels of learners at FE colleges in Wales over the past 15-year-period. Guided contact hours are used to determine the achievement levels of learners at FE colleges in Wales, and serve as a proxy for the level of skills learners contribute to the regional workforce. Using these data in conjunction with the wage differentials from Table 2, we can determine the total amount of higher earnings associated with the educational achievements of past and present learners. We then convert this to value added using the ratios supplied by the IO model. The result, equal to £2.4 billion, appears in Table 10 and represents the accumulated direct effect of the added skills acquired by learners whom FE colleges in Wales have served over the last 15 years.

Multiplier effects occur as learners generate an increased demand for consumer goods and services through the expenditure of their higher wages. Further, as the industries where learners of FE colleges in Wales are employed increase their output, there is a corresponding increase in the demand for input from the industries in the employers' supply chain.

Altogether, the accumulated impact of former learners from FE colleges in Wales who are currently employed in the national workforce amounts to £3.5 billion, the

sum of £2.4 billion in initial effects and £1.1 billion in direct, indirect and induced effects. These results appear in Table 10.

Total Impact on Regional Economy

Table 11 displays the grand total of the impact of FE colleges in Wales on the national economy in 2014-15. Altogether, the results of this study show that the economic impact of FE colleges in Wales to the local business community in Wales is approximately £4 billion each year. This is equal to around 9.1% of the Welsh economy and represents roughly 183,530 average wage jobs.

These results demonstrate several important points. First, FE colleges in Wales promote national economic growth through their operations spending, through the spending of learners from outside of Wales, and through the increase in productivity as former learners from FE colleges in Wales remain active in the national workforce. Second, the impact of added skills in the national workforce is by far the largest and most important impact of FE colleges in Wales, stemming from higher incomes of learners and their employers. And third, national income in Wales would be substantially lower without the educational activities of FE colleges in Wales.

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TABLE 11. Total impact of FE colleges in Wales (£ thousands)

	TOTAL	% OF TOTAL
Total income in the region	£43,768,808,102	
Impact of staff and college expenditure	£455,529	1.0%
Impact of expenditure of non-local learners	£5,124	<.1%
Impact of added workforce skills	£3,533,539	8.1%
Total impact on local business community	£3,994,192	9.1%

Source: Emsi.

CONCLUSION

The results of this study demonstrate that FE colleges in Wales create value from multiple perspectives. The colleges address the needs of employers by providing them with staff development opportunities and supplying the workforce with qualified, trained workers. Local businesses benefit from the patronage of FE colleges in Wales and the expenditure of college staff and learners. The colleges also indirectly benefit taxpayers by generating increased tax receipts and reducing the demand for public sector services.

The most important value that FE colleges in Wales create, however, is the impact they have on their learners. The experiences that learners receive at the colleges have the power to shape the rest of their lives and put them on the path to becoming happy and productive members of their communities. This, after all, is the colleges' mission, and for as long as they continue to deliver excellence to learners, all other stakeholder groups will see the positive impacts of learning in their lives too.

REGIONAL ECONOMIC IMPACT ANALYSIS

BENEFITS TO LOCAL BUSINESS COMMUNITY

£455,529	Added income created by staff and college expenditure (£ thousands)
£5,124	Added income created by expenditure of non-local learners (£ thousands)
£3,533,539	Added income created by added skills (£ thousands)
£3,994,192	Total income created in the regional economy (£ thousands)
9.1%	% of total output of the regional economy
183,530	Total output as number of average wage jobs

INVESTMENT ANALYSIS

BENEFITS TO LEARNERS

£5.5 BILLION	Present value of higher future earnings over working life (£ thousands)
20.8%	Rate of return
6.9	Benefit/cost ratio

BENEFITS TO SOCIETY

£13.3 BILLION	Present value of added income and social externalities (£ thousands)
24.0%	Rate of return
7.9	Benefit/cost ratio

BENEFITS TO TAXPAYERS

£2.4 BILLION	Present value of added tax receipts and avoided costs (£ thousands)
20.4%	Rate of return
6.3	Benefit/cost ratio

About Emsi Economic Modelling Specialists International (Emsi) provides employment data and economic analysis via web tools and custom reports. The company has also produced more than 1,300 comprehensive impact analyses for colleges and universities in the UK, US, Canada, and Australia. Founded in 2000, Emsi is located in Moscow, Idaho with branch offices in the UK, and it serves education, economic, and workforce development institutions and organisations. Visit our website at www.economicmodelling.co.uk for more information.