



DEMONSTRATING THE VALUE OF THE

West Yorkshire Consortium of Colleges

EXECUTIVE SUMMARY

August 2013

ANALYSIS OF THE SOCIAL & ECONOMIC IMPACT OF LEARNING

emsi



INTRODUCTION

The West Yorkshire Consortium of Colleges (WYCC) creates value in many ways. WYCC member colleges are committed to putting their 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 Consortium member colleges' provision enables learners to acquire qualifications and develop the skills they need in order to have a fulfilling and prosperous career. WYCC member colleges also provide an excellent environment for learners to meet new people and make friends, while participation in college 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 contribution of WYCC consists of so much more than solely influencing the lives of learners. The member colleges' provision supports a range of employment sectors in the WYCC service region, referred to as the West Yorkshire Region and defined as Bradford, Calderdale, Leeds, Kirklees, and Wakefield in the Yorkshire and the Humber of England. This provision supplies employers with the skilled workers they need to make their businesses more productive. The expenditure of the WYCC member colleges, 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 WYCC 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 impact of WYCC on its 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. Some of the more recent studies include Fujiwara's (2012)¹ analysis of the impact of adult learning and the March 2010/11 study commissioned by the Department for Business, Innovation and Skills (BIS)² on the economic impact of the FE Sector. Although the approaches used in these and other similar studies vary, they all contribute valuable information to the growing body of evidence that proves the value of investing in education.

The approach in this study is twofold. We begin with

1 Daniel Fujiwara, 'Valuing the Impact of Adult Learning' (National Institute of Adult Continuing Education: Leicester, 2012).

2 Rachel Beaven et al, 'Measuring the Economic Impact of Further Education' (Department for Business, Innovation and Skills, BIS Research Paper Number 38: London, March 2011).

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a standard investment analysis to determine how the investments in WYCC 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 WYCC member colleges. 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 WYCC member 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 Skills Funding Agency. In return for these investments, learners receive a lifetime of higher earnings, society benefits 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 WYCC on the local

business community in the West Yorkshire Region. 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 West Yorkshire Region's economy as a result of the increased consumer spending and added skills generated by WYCC member colleges and their learners. Results of the regional economic impact analysis are measured in terms of the added income created by the following three effects: 1) impact of staff and member college expenditure, 2) impact of learner expenditure, and 3) impact of the skills acquired by learners still active in the West Yorkshire Region's workforce.

Data and assumptions used in the study are based on several sources, including the 2011-12 Individual Learner Records (ILR) reports from WYCC member colleges, 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 WYCC for full documentation of the study.



STUDY HIGHLIGHTS

The results of this study show that WYCC has a significant positive impact on its 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 **£48.1 million** to cover the cost of tuition fees and books and supplies at WYCC member colleges in 2011-12. All learners also forwent **£557.9 million** in earnings that they would have generated had they been working instead of learning.
- In return for the monies that learners invest in WYCC member colleges, they will receive a present value of **£1.7 billion** in increased earnings over their working lives.
- Every £1 that learners pay for their education at WYCC member colleges yields **£2.80** in higher future wages. This translates to a **10.3%** annual return on their investment.

BENEFITS TO SOCIETY

- Society as a whole invested **£1.3 billion** in WYCC member colleges through direct outlays and the loss of potential output from learners who spent time at the Consortium's member colleges rather than working.
- In return, society in the UK will receive a present value of **£3.7 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 reduced crime, lower unemployment, and increased health and well-being.

- Society will receive **£2.90** in benefits in return for every £1 invested in WYCC member colleges. The average annual return on investment is **11.3%**.

BENEFITS TO TAXPAYERS

- Taxpayers in the UK paid **£219.3 million** to support the operations of WYCC member colleges in 2011-12.
- The net present value of the added tax revenue stemming from the learners' higher lifetime incomes and the increased output of businesses amounts to **£578.2 million** in benefits to taxpayers. Avoided costs to the public sector adds another **£43.4 million** in benefits due to a reduced demand for government-funded social services in the UK.
- Taxpayers see an average annual return of **11.3%** on their investment in WYCC member colleges. The corresponding benefit-cost ratio is **£2.80** in benefits returned for every £1 in costs.

REGIONAL ECONOMIC IMPACT ANALYSIS

IMPACT OF STAFF AND MEMBER COLLEGE EXPENDITURE

- WYCC member colleges employed **5,993** full-time equivalent (FTE) staff in 2011-12. Staff costs amounted to **£170.2 million**, much of which was spent in the West Yorkshire Region to purchase groceries, clothing, and other household goods and services.
- The Consortium's member colleges are buyers of goods and services and spent **£101.8 million** to support their operations in 2011-12. This expenditure further benefited many local suppliers in the West Yorkshire Region.
- The net impact of staff and member college expenditure in the West Yorkshire Region comes to approximately **£214.2 million** in added income in the regional economy each year.

IMPACT OF LEARNER EXPENDITURE

- WYCC member college learners who relocate to the West Yorkshire Region 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 WYCC member colleges' non-local learners annually adds approximately **£5.3 million** in income to the West Yorkshire Region's economy.

IMPACT OF ADDED WORKFORCE SKILLS

- Many of the WYCC member colleges' learners stay in the West Yorkshire Region. Their enhanced skills and abilities bolster the output of local employers, leading to higher regional income and a more robust economy.
- The accumulated impact of former WYCC member college learners who are currently employed in the regional workforce amounts to **£1.6 billion** in added income in the West Yorkshire Region's economy each year.

TOTAL IMPACT ON LOCAL BUSINESS COMMUNITY

- Altogether, the economic contribution of WYCC and its member colleges to the local business community in the West Yorkshire Region is **£1.8 billion** each year.
- Total added income created by WYCC and its member colleges' learners is equal to **3.8%** of the total economic output of the West Yorkshire Region and represents roughly **77,042** average wage jobs.

METHODOLOGY & RESULTS

The WYCC member colleges 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, WYCC investigates the benefits its member colleges 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 WYCC and its member colleges 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 2011-12, WYCC member colleges served 110,456 unique learners across various qualifications and levels. Table 1 shows the breakdown of enrolments at the WYCC member colleges by education level, beginning with entry level up through greater than Level 3. As

indicated, the bulk of the member colleges' provision was at Level 3, comprising 33% of all enrolments, followed by Level 2, which comprised 32% of all enrolments.

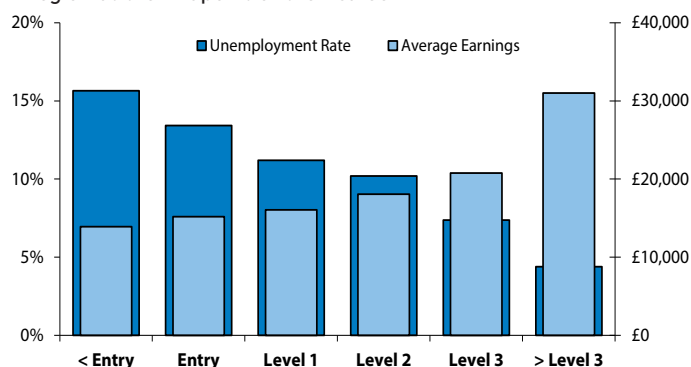
In order to go to one of the WYCC member colleges and depending on their level of funding, learners pay money to cover the cost of tuition fees and purchase books and supplies. All learners also forgo earnings that they would have generated had they been working instead of learning. Together these two cost factors comprise the learners' total investment in their education at the WYCC member college, equal to £606 million in 2011-12 (the sum of £48.1 million in tuition fees, books, and supplies and £557.9 million in forgone earnings).

TABLE 1. Breakdown of enrolments at WYCC member colleges, 2011-12

EDUCATION LEVEL	%
Entry Level	13%
Level 1	17%
Level 2	32%
Level 3	33%
> Level 3	5%
Total	100%

Source: Data supplied by WYCC member colleges.

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



This translates to an average cost of £5,486 per learner, the bulk of which comprises the opportunity cost of 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 a WYCC member college will see an increase in earnings of £2,719 each year compared to someone with Level 2 qualifications. This amounts to a present value of approximately £97,891 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 the WYCC member colleges in 2011-12. 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 benefits tailored to the learners' specific achievement levels at the WYCC member colleges.

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 £1.7 billion. Costs are provided in the second row of Table 3, equal to £606 million, which includes tuition fees, books and supplies, and the opportunity cost of time. By dividing the £1.7 billion in benefits by the £606 million in costs, we derive a benefit-cost ratio of 2.8. This means that, for every £1 learners invest in the WYCC member colleges in the form of tuition fees and forgone earnings, they will receive a cumulative £2.80 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 the WYCC member colleges' learners earning an average annual rate of return of 10.3% on their investment of time and money. This is an impressive return compared, for example, to the less than 3% return per annum that can be expected from saving money in today's Individual Savings Accounts (ISAs).

Benefits to Society

WYCC and its member colleges 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 crime, unemployment, and poor lifestyle habits by positively influencing the health and well-being of their learners.

TABLE 2. Average lifetime earnings by education level received in the West Yorkshire Region, undiscounted

EDUCATION LEVEL	EARNINGS	DIFFERENCE
< Entry level	£500,825	n/a
Entry	£546,400	£45,575
Level 1	£577,768	£31,369
Level 2	£649,865	£72,096
Level 3	£747,755	£97,891
> Level 3	£1,116,281	£368,525

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

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

A. Present value of future earnings stream	£1,690,966
B. Present value of learner costs	£605,968
Net present value (A – B)	£1,084,998
Benefit/cost ratio (A / B)	2.8
Rate of return	10.3%

Source: EMSI.

From the perspective of society, the social value created by WYCC and its member colleges 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 the WYCC member colleges. 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.

WYCC and its member colleges' social value 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 disorders. 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 the WYCC member colleges' learners. As shown, added income amounts to a present value of £3.5 billion, due to the increased lifetime earnings of learners and associated increases in business output. Social savings amount to £163.3 million, the sum of health, crime, and unemployment savings in the UK (see also Figure 2). Altogether, the total social value of the WYCC member colleges is £3.7 billion. Note that the figures in Table 4 have been adjusted to account for counterfactual outcomes where the WYCC member colleges do not exist.

In order to calculate society's return on investment, we must first determine what it cost society to support WYCC and its member colleges during the reporting year. Costs to society break down into two main categories, direct outlays and opportunity costs. Direct outlays to WYCC and its member colleges simply refer to their operating and non-operating revenues, equal to £268 million in 2011-12. Opportunity costs refer to the loss of earnings and output that would have been

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

	TOTAL
ADDED INCOME	
Increased income in the UK	£3,534,962
SOCIAL SAVINGS	
Health savings*	£43,006
Crime savings	£108,703
Unemployment savings†	£11,609
Total	£3,698,279

* Includes savings from reduced smoking, obesity, and mental disorders.

† Includes savings from a reduced number of JSA claimants.

Source: EMSI.

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

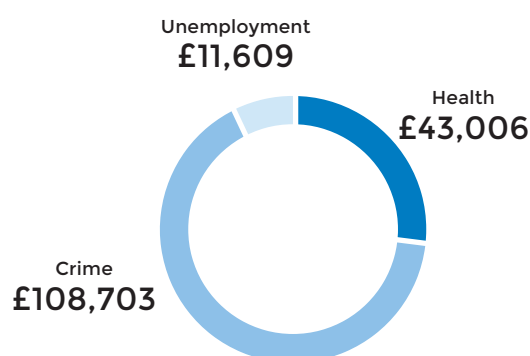


TABLE 5. Present value of benefits and costs, social perspective (£ thousands)

A. Present value of social benefits	£3,665,938
B. Present value of social costs	£1,276,694
Net present value (A – B)	£2,389,245
Benefit/cost ratio (A / B)	2.9
Rate of return	11.3%

Source: EMSI.

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 had taxes been collected on the incomes that learners forgo. Together direct outlays and opportunity costs equal £1.3 billion in costs to society during the reporting year.

Table 5 shows the investment analysis results. In return for the £1.3 billion that society invests in WYCC and its member colleges, it receives a net gain (in present value terms) of £2.4 billion. The associated benefit-cost ratio is £2.90 for every £1 spent, and the average return on investment is 11.3% 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 the WYCC member colleges. 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 £578.2 million.

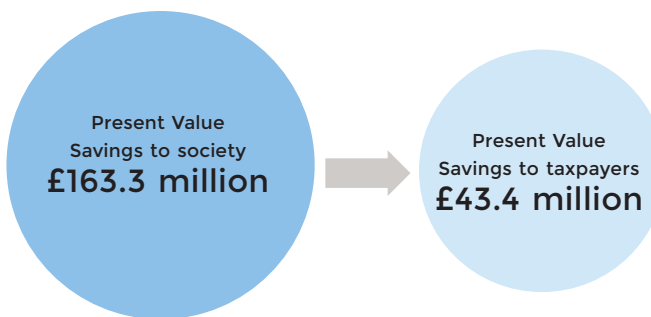
A portion of the social savings enjoyed by society also accrues strictly to taxpayers. As learners become more employable, the demand for Jobseekers’ Allowance benefits reduces. Learners put less of a demand on the National Health Service (NHS) for medical treatment as a result of their improved health 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 £163.3 million in health, crime, and unemployment savings to society translates to £43.4 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.

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

A. Present value of taxpayer benefits	£621,631
B. Present value of taxpayer costs	£219,342
Net present value (A – B)	£402,289
Benefit/cost ratio (A / B)	2.8
Rate of return	11.3%

Source: EMSI.

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



Summing the present value of the added tax revenues and savings to taxpayers yields £621.6 million (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 £219.3 million. These represent the total funding received by WYCC member colleges from taxpayers in 2011-12.

By comparing taxpayer costs to the £621.6 million in benefits, we derive a benefit/cost ratio of 2.8. This means that for every £1 of public money invested in the WYCC member colleges, taxpayers receive a cumulative value of £2.80 over the course of the learners’ working lives. This translates to a 11.3% annual return on investment to taxpayers for their support of WYCC member colleges, again a solid investment that compares favourably with other long-term investments in both the private and public sectors.

REGIONAL ECONOMIC IMPACT ANALYSIS

WYCC promotes economic growth in the West Yorkshire Region in a variety of ways. Each member college is an employer and a buyer of goods and services, while the living expenses of learners from outside of the region benefit local businesses. In addition, the WYCC member colleges are a primary source of education to local residents and suppliers of trained workers to local industry.

In this section we examine the economic impacts of WYCC on the local business community through the increased consumer spending and enhanced business productivity generated by the member colleges and their learners. The impacts reflect the economic relationships among the West Yorkshire Region’s industries and are calculated using EMSI’s proprietary input-output (IO) model. The model places particular reference on how much each industry purchases from every other industry by using NUTS3 (county and unitary authority level) area 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 Consortium’s 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 effects: 1) impact of staff and member college expenditure, 2) impact of the expenditure of learners who relocate to the West Yorkshire Region to attend one of the member

colleges, and 3) impact of the added skills of former WYCC member college learners who are still employed in the West Yorkshire Region's workforce.

Impact of Staff and Member College Expenditure

Each WYCC member college is an important employer in the West Yorkshire Region, providing jobs for a wide range of staff across a number of occupations. In 2011-12, the member colleges employed full-time and part-time staff equivalent to 5,993 full-time employees. Of these, approximately 75% were West Yorkshire Region residents. Total staff costs at WYCC member colleges in 2011-12 amounted to £170.2 million, which became part of the West Yorkshire Region's overall income. Staff expenditure on groceries, eating out, clothing, and other household costs also helped support local shops and businesses.

In addition to their staff, the WYCC member colleges are large-scale buyers of goods and services. In 2011-12, the member colleges spent £101.8 million to support their operations. Much of this expenditure benefited local suppliers in the West Yorkshire Region, creating a knock-on effect that generated additional employment and income throughout the regional economy.

The impact of WYCC member colleges' payroll and purchases is subdivided into the following two main effects: the direct effect and the indirect effect. The direct effect comprises the member colleges' payroll and employee benefits, less monies paid to individuals working outside the region. The indirect effect refers to the additional income created in the economy as WYCC member colleges' employees and suppliers spend money in the region to purchase even more supplies and services.

To calculate the indirect effect, we remove any expenditures that occur outside of the West Yorkshire Region and map the remainder to the 19 top-level industry sectors of the IO model. We then run the data through the model's knock-on matrix to estimate how the spending of the member colleges and their 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 £227.1 million in gross impacts attributable to the direct effect of staff costs plus the indirect effect that occurs as the member colleges and their staff spend money in the region.

One adjustment must be made to the gross impact before deriving the net impact of staff and member college expenditure. WYCC member colleges received an estimated 13.1% of funding from local sources in the West Yorkshire Region, whether from local residents (in

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

	TOTAL
Total income in the region	£49,210,022
Direct effect of staff costs	£126,985
Indirect effect	£100,132
Gross total	£227,117
Alternative use of funds adjustment	-£12,870
Net total	£214,247

Source: EMSI.

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 member colleges create in the West Yorkshire Region's economy is offset by the income that they withdraw from the economy. As such, not all of the impacts generated by the WYCC member colleges and their staff can be considered new monies brought to the region.

To determine the 'net' impact of WYCC member college 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 knock-on effect, and convert the amounts to income. The result, equal to £12.9 million, allows us to see what income would have been created in the West Yorkshire Region anyway, even if the WYCC member colleges did not exist.

Subtracting the £12.9 million in alternative uses of funds from the £227.1 million in gross impacts yields a net impact of £214.2 million in added income in the regional economy. This value appears in the bottom row of Table 7. Assuming that the WYCC member colleges employ approximately the same number of people and spend approximately the same amount each year, this value may be considered an annual figure.

Impact of Learner Expenditure

Learners who relocate to the West Yorkshire Region to attend one of the WYCC member colleges 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 WYCC member colleges' non-local learners support local suppliers and create knock-on effects, thereby generating income and a need for further jobs.

In order to calculate the knock-on effects of out-of-region learners, we begin by estimating their gross expenditure in 2011-12, a total of £7.9 million. Note that we exclude the expenses of in-commuters since they spend little in the region compared to those who live in the West Yorkshire Region. We then calculate

the direct effect by mapping the £7.9 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 indirect effect comprises the additional income created as the businesses that benefit from the WYCC member colleges' non-local learners also spend money in the West Yorkshire Region. We derive this effect by running the same £7.9 million in sales (net of leakage) through the knock-on matrix and applying value added-to-sales ratios from the IO model to convert the results to income.

Summing together the direct and indirect effect, we estimate that the spending of the WYCC member colleges' out-of-region learners annually adds approximately £5.3 million in income to the West Yorkshire Region's economy. Since we are capturing the impacts of only those learners who relocate to the region (thereby injecting new monies into the West Yorkshire Region's economy), we do not have to adjust for the alternative use of funds as we did for the staff and member college expenditure in the previous section. All of the results leading to this impact are presented in Table 8.

Impact of Added Workforce Skills

WYCC's strong focus on workforce development manifests itself at all levels of the member colleges' provision. In addition to delivering specific training and consultancy solutions to businesses, the member colleges maintain close links with local employers in order to target the type of employee training that best meets their growth strategies. Further, the WYCC member colleges' vocational learning programmes and apprenticeships allow employers and the member 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 West Yorkshire Region labour force.

Employee training and development is just one way that employers benefit from the presence of the WYCC member colleges. By aligning their provision with key employment sectors in the region, the member colleges help produce the skilled workers that are needed to support the West Yorkshire Region labour market. Table 9 presents the percentage breakdown of the WYCC member college instructional activity by top-level subject sector categories, based on their GLH production. Preparation for Life and Work comprises the highest percentage of activity (23%), followed by Health, Public Services and Care (15%) and Arts, Media and Publishing (11%).

TABLE 8. Impact of expenditure of non-local learners (£ thousands)

	TOTAL
Total income in the region	£49,210,022
Direct effect of learner expenditure	£3,857
Indirect effect	£1,408
Total	£5,265

Source: EMSI.

TABLE 9. WYCC member colleges' breakdown of instructional activity by subject sector

SECTOR SUBJECT AREA	% OF TOTAL
Preparation for Life and Work	23%
Health, Public Services and Care	15%
Arts, Media and Publishing	11%
Construction, Planning and the Built Environment	10%
Retail and Commercial Enterprise	8%
Engineering and Manufacturing Technologies	6%
Business, Administration and Law	6%
Information and Communication Technology	5%
Leisure, Travel and Tourism	5%
Science and Mathematics	3%
Languages, Literature and Culture	2%
Agriculture, Horticulture and Animal Care	2%
Education and Training	2%
Social Sciences	1%
History, Philosophy and Theology	1%
Total	100%

Source: Data supplied by WYCC member colleges.

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

	TOTAL
Total income in the region	£49,210,022
Direct effect of added workforce skills	£960,457
Indirect effect	£666,784
Total	£1,627,241

Source: EMSI.

Many of the WYCC member colleges' learners stay in the West Yorkshire Region and are more productive because of the quality education they invested in at the member college. Over time, the skills of former learners accumulate, steadily increasing the training level and experience of the West Yorkshire Region's workforce. 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 knock-on effects. The sum of all these direct and indirect effects comprises the total impact of the learners' added skills in the West

Yorkshire Region's economy.

Assigning a monetary value to the added skills acquired by learners that are still active in the West Yorkshire Region's workforce requires data on the historical enrolments and corresponding achievement levels of the WYCC member colleges' learners over the past 15-year-period. Guided Learner Hours (GLH) are used to determine the achievement levels of the WYCC member colleges' learners, 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 £960.5 million, appears in Table 10 and represents the accumulated direct effect of the added skills acquired by learners whom the WYCC member colleges have served over the last 15 years.

To calculate the indirect effect, the model allocates increases in regional income to specific industrial sectors and augments these to account for both demand-side and supply-side knock-on effects. Demand-side effects refer to the increased demand for consumer goods and services as the higher incomes of skilled workers and their employers are spent in the local economy. Supply-side effects occur through a process of 'agglomeration,' whereby growth becomes to some degree self-perpetuating. The presence of one industry, for example, attracts other industries that use the first industry's outputs as inputs, which produces subsequent rounds of industry growth, and so on. Both demand-side and

supply-side effects are calculated using the knock-on matrix and value-added to sales ratios provided by the regional IO model.

Altogether, the accumulated contribution of former WYCC member college learners who are currently employed in the regional workforce amounts to £1.6 billion, the sum of £960.5 million in direct effects and £666.8 million in indirect effects. These results appear in Table 10.

Total Impact on Regional Economy

Table 11 displays the grand total of the impact WYCC and its member colleges have on the West Yorkshire Region in 2011-12. Altogether, the results of this study show that their economic contribution to the local business community in the West Yorkshire Region is approximately £1.8 billion each year. This is equal to around 3.8% of the West Yorkshire Region's total economy and represents roughly 77,042 average wage jobs.

These results demonstrate several important points. First, WYCC and its member colleges promote regional economic growth through their operations spending, through the spending of their non-local learners, and through the increase in productivity as former learners remain active in the regional workforce. Second, the impact of added skills in the regional workforce is by far the largest and most important impact of WYCC and its member colleges, stemming from higher incomes of learners and their employers. And third, regional income in the West Yorkshire Region would be substantially lower without the educational activities of the WYCC member colleges.

TABLE 11. Total impact of WYCC and its member colleges (£ thousands)

	TOTAL	% OF TOTAL
Total income in the region	£49,210,022	
Impact of staff and College expenditure	£214,247	0.4%
Impact of expenditure of non-local learners	£5,265	<.1%
Impact of added workforce skills	£1,627,241	3.3%
Total impact on local business community	£1,846,753	3.8%

Source: EMSI.

CONCLUSION

The results of this study demonstrate that WYCC and its member colleges create value from multiple perspectives. They 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 the WYCC member colleges and the expenditure of their staff and learners. The Consortium also indirectly benefits taxpayers by generating increased tax receipts and reducing the demand for public sector services.

The most important value that WYCC creates, however, is the impact its member colleges have on their learners. The experiences that learners receive at the member 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 WYCC's mission, and for as long as its member colleges 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

£214,247	Added income created by staff and member college expenditure (£ thousands)
£5,265	Added income created by expenditure of non-local learners (£ thousands)
£1,627,241	Added income created by added skills (£ thousands)
£1,846,753	Total income created in the regional economy (£ thousands)
3.8%	% of total output of the regional economy
77,042	Total output as number of average wage jobs

INVESTMENT ANALYSIS

BENEFITS TO LEARNERS

£1,084,998	Net present value of higher future earnings over working life (£ thousands)
10.3%	Return on investment
2.8	Benefit/cost ratio

BENEFITS TO SOCIETY

£2,389,245	Net present value of added income and social externalities (£ thousands)
11.3%	Return on investment
2.9	Benefit/cost ratio

BENEFITS TO TAXPAYERS

£402,289	Net present value of added tax receipts and avoided costs (£ thousands)
11.3%	Return on investment
2.8	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.