



Research Report

Harmonisation in Building and Construction Qualifications: Developing a business case for meaningful collaboration

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Executive summary

This document summarises the process used in preparing a concept case for the harmonisation of resource materials for the National Diplomas in Construction Management, Quantity Surveying and Architectural Technology.

The overarching goal of the project was to explore the development and housing of shared online resources that support the delivery of three Level 6 National Diplomas across 10 collaborating institutes of technology and polytechnics (ITPs). These resources were intended to align with new industry standards in a cost-effective manner to ensure the viability and consistency of future delivery across the sector. Ako Aotearoa funding was provided to establish the collaboration and build a concept case for ongoing work.

This report describes the process, led by The Open Polytechnic of New Zealand (TOPNZ), by which this collaboration was conducted. Examples of how the various collaborative options were considered are outlined, as well as the expected benefits of this approach for organisations, industry and learners. Overall, the expected advantages of a collaborative model included:

- greater confidence for students by knowing that information used in course preparation is current and relevant
- enhanced confidence for industry stakeholders by knowing that taught material is consistent and current throughout New Zealand
- better resources for lecturers leading to better teaching delivery standards
- increased flexibility of resources that are able to be customised for any specific students' or regional needs.

The developed concept case was circulated to the 10 chief executives of the participating ITPs currently delivering programmes that lead to one or more of the national diplomas. In essence the chief executives were asked for:

- agreement in principle to the concept case
- a financial contribution to enable development of a full business case for the pilot programme and the full Harmonisation programme
- recognition that significant implementation resource issues need addressing for the full Harmonisation programme to be achieved.

The project has resulted in an enduring collaboration through the now formalised Council for Built Environment Education in New Zealand (CBEENZ). The eight ITPs currently involved in CBEENZ are taking a united approach to the targeted review of qualifications relating to the three national diplomas.

A significant benefit already realised from this project is that it brought together from across the ITP sector key people with a vested interest in the national diplomas. Beginning a conversation is a first step towards sustainable collaboration, and the discussions that led to the development of the concept case enabled cross-sector relationships to be renewed and/or established.

The proposed Harmonisation project remains an opportunity for:

- practical implementation of key strategies in relation to harmonisation of the construction-related national diploma qualifications

- collaborative working between providers and industry
- providers to enhance learner outcomes through sector efficiencies, and improved returns on investment covering over 700 EFTS collectively among participating ITPs.

The outcomes of this project point to the importance of high-quality teaching and learning practice that is built upon collective knowledge and shared resources. The expected longer-term goals from this initial collaborative activity include:

- establishing the foundations for a more flexible and constructivist approach to teaching and learning by developing a website that enables future learners to access their personal learning environment
- making available the best possible resources for building and construction qualifications offered by the ITP sector
- learners having a choice of where and how to study, knowing that wherever that is, the quality of resource material will be the similar.

Introduction

Ten ITPs deliver courses that contribute to the achievement of one or more of the Level 6 National Diplomas in Architectural Technology (NDAT), Construction Management (NDCM) and Quantity Surveying (NDQS). The national diplomas are sizeable qualifications, ranging from 235 to 275 credits, and updated versions are in the process of being registered on the national qualifications framework. Updates to national qualification specifications require ITPs to update their offerings to reflect current industry requirements.

The cost of writing (or rewriting) the necessary material is not insignificant and while it may be within the capability of any or all ITPs currently delivering one or more of the national diplomas, it is arguably not the best use of financial and staff resources.

Funding was sought from and provided by Ako Aotearoa to develop a mechanism for working collaboratively with those ITPs interested in developing a shared resource, available for use by all participating ITPs' staff.

Input was also sought from the industry training organisations (ITOs) that own the qualifications.

The Open Polytechnic of New Zealand applied for and received funding to lead the collaborative development process in partnership with the 10 accredited ITPs currently teaching one or more of the three national diplomas.

The chief executive of the The Open Polytechnic of New Zealand invited the chief executives of the participating ITPs to send a representative to a workshop convened by the Open Polytechnic in Lower Hutt.

At the workshops, various models of collaboration were discussed in two key areas: resource contribution and development of the final resource.

The project's overall goal was to develop shared online resources and house these on a standalone website to support ITP sector delivery of the three national diplomas in a cost-effective manner to ensure the viability and consistency of future delivery across the sector. Ako Aotearoa funding was provided to establish the collaboration and build a business case for the ongoing work.

It is important to recognise that implementation of this proposal would provide a library of resource material upon which each ITP could build its own teaching course materials. While there would likely be some material in a format that could be used immediately for teaching purposes, all ITPs would need to customise it to meet their specific needs.

This document outlines the processes adopted in bringing together a range of strategic, operational, tactical, financial and resource options to develop and implement the Harmonisation programme, and it provides an "outline" that may enable others to adopt similar methodology.

Identifying the “business challenge”: Environmental scanning

Definitions

Organisations scan the environment in order to understand the external forces of change so that they may develop effective responses that secure or improve their position in the future.

They scan in order to avoid surprises, identify threats and opportunities, gain competitive advantage, and improve long-term and short-term planning (Sutton, 1988; Choo and Auster, 1993).

Environmental scanning is the acquisition and use of information about events, trends and relationships in an organisation's external environment, the knowledge of which would assist management in planning the organisation's future course of action (Aguilar, 1967).

The process of environmental scanning involves gathering, analysing, and dispensing information for tactical or strategic purposes. The environmental scanning process entails obtaining both factual and subjective information on the business environments in which a company is operating or considering entering.

There are three ways of scanning the business environment:

- *ad hoc* scanning: short-term, infrequent examinations usually initiated by a crisis
- regular scanning: studies done on a regular schedule (*e.g.* once a year)
- continuous scanning (also called continuous learning): continuous structured data collection and processing on a broad range of environmental factors.

Most commentators feel that in today's turbulent business environment, the best scanning method available is continuous scanning because this allows the firm to act quickly, take advantage of opportunities before competitors do, and respond to environmental threats before significant damage is done (http://en.wikipedia.org/wiki/Environmental_scanning).

Approach

The expected benefits of a collaborative approach to resource development include:

- confidence for students, knowing that information used in course preparation is current and relevant
- confidence for industry stakeholders knowing that taught material is consistent and current throughout New Zealand
- better resources for lecturers leading to better teaching delivery standards
- flexibility of resources that are able to be customised for any specific students' or regional needs.

On that basis, the environmental scanning approach was to identify:

- those ITPs which offer current programmes in relevant qualifications
- the size of each programme in each ITP by EFTS
- the credit value of each qualification
- courses that are common to two or more qualifications

- resource issues (skills and staffing) relevant to each ITP delivering the qualifications
- the business needs required to be met, through consultation with the ITO and relevant business groups.

Outputs

- A table comparing each provider in terms of what they deliver and the relative number of EFTS.
- Tables showing the schematic conclusions developed from the environmental scanning.

Examples

There were 10 ITPs offering the current unit standards that underpin one or more of the NDAT, NDCM and NDQS. These are as follows:

| | NDAT | NDCM | NDQS |
|---|------|------|------|
| Bay of Plenty Polytechnic (BOPP) | Y | Y | Y |
| Christchurch Polytechnic Institute of Technology (CPIT) | Y | Y | Y |
| Northland Polytechnic (NorTec) | Y | N | N |
| The Open Polytechnic of New Zealand (TOPNZ) | Y | Y | Y |
| Otago Polytechnic | Y | Y | Y |
| Southern Institute of Technology (SIT) | Y | Y | Y |
| Unitec | Y | Y | Y |
| Waikato Institute of Technology (Wintec) | Y | Y | Y |
| WelTec | Y | Y | Y |
| Western Institute of Technology (WITT) | Y | N | N |

The credits attached to each programme are currently:

| | NDAT | NDCM | NDQS (Compulsory) | NDQS (Optional) |
|--------------------|------------|------------|-------------------|-----------------|
| Total credit value | 275 | 245 | 215 | 20 |

Each programme comprises a number of common courses as below:

| Number of courses ... | |
|--|----------|
| Common to NDCM and NDQS (Optional) | 6 |
| Common to NDCM and NDQS (Compulsory) | 4 |
| Common to NDCM and NDAT | 2 |
| Common to NDCM, NDAT and NDQS (Optional) | 1 |
| Common to NDCM, NDAT and NDQS (Compulsory) | 8 |
| NDCM only | 3 |
| NDAT only | 7 |
| NDQS (Compulsory only) | 5 |

The mix of elective and core courses can be shown as:

| COURSE STRUCTURE FOR OLD NATIONAL DIPLOMA (NDAT, NDCM & NDQS) | | | | | | | | | | |
|---|---|--|---------|-------------------------|--------------------------|-------------------------------|-----------------------------|----|----|---|
| US | Title | Level | Credits | Construction Management | Architectural Technology | Quantity Surveying Compulsory | Quantity Surveying Optional | | | |
| 9632 | US9632 Tendering | 6 | 15 | ✓ | 15 | | | ✓ | 15 | |
| 9633 | US9633 Construction Methodology | 6 | 15 | ✓ | 15 | | | ✓ | 15 | |
| 9635 | US9635 Site Quality Assurance | 5 | 5 | ✓ | 5 | | | ✓ | 5 | |
| 9636 | US9636 Construction Planning | 6 | 5 | ✓ | 5 | | | ✓ | 5 | |
| 9637 | US9637 Programme Practice | 6 | 15 | ✓ | 15 | | | ✓ | 15 | |
| 9639 | US9639 Demonstrate knowledge of | 6 | 5 | ✓ | 5 | | | | | |
| 9640 | US9640 Site Management | 6 | 10 | ✓ | 10 | | | | | |
| 9658 | US9650 Estimate costs for a small building | 5 | 10 | ✓ | 10 | | ✓ | 10 | | |
| 9659 | US9659 Tender admin | 5 | 5 | ✓ | 5 | ✓ | 5 | | | |
| 9661 | US9661 Contract admin | 5 | 10 | ✓ | 10 | ✓ | 10 | | | |
| 9663 | US9663 Site Feasibility | 5 | 5 | ✓ | 5 | ✓ | 5 | | ✓ | 5 |
| 9664 | US9664 Building Law | 5 | 10 | ✓ | 10 | ✓ | 10 | ✓ | 10 | |
| 9667 | US9667 Building Services | 5 | 10 | ✓ | 10 | ✓ | 10 | ✓ | 10 | |
| 9668 | US9668 Building Services -commercial | 5 | 10 | ✓ | 10 | ✓ | 10 | ✓ | 10 | |
| 9669 | US9669 Building Materials | 4 | 10 | ✓ | 10 | ✓ | 10 | ✓ | 10 | |
| 9670 | US9670 Built Environment | 5 | 10 | ✓ | 10 | ✓ | 10 | ✓ | 10 | |
| 9671 | US9671 Construction | 5 | 15 | ✓ | 15 | ✓ | 15 | ✓ | 15 | |
| 9672 | US9672 V6 Construction medium, large | 6 | 25 | ✓ | 25 | ✓ | 25 | ✓ | 25 | |
| 10039 | US10039 Measure schedules of quantities for | 6 | 15 | ✓ | 15 | | ✓ | 15 | | |
| 10040 | US10040 Measurement, commercial | 6 | 25 | | | | ✓ | 25 | | |
| 10041 | US10041 Tender Estimate | 5 | 15 | | | | ✓ | 15 | | |
| 10042 | US10042 Sub-contract negotiations | 5 | 10 | ✓ | 10 | | ✓ | 10 | | |
| 10043 | US10043 Preliminary Estimates | 6 | 10 | | | | ✓ | 10 | | |
| 10044 | US10044 Administer contracts and value | 6 | 15 | | | | ✓ | 15 | | |
| 10045 | US10045 Quantity surveying programming | 5 | 5 | | | | ✓ | 5 | | |
| 10161 | US10161 Design Brief | 5 | 5 | | ✓ | 5 | | | | |
| 10162 | US10162 Design Presentation | 5 | 10 | | ✓ | 10 | | | | |
| 10163 | US10163 Design Documentation | 6 | 10 | | ✓ | 10 | | | | |
| 10164 | US10164 Architectural Drawing | 5 | 45 | | ✓ | 45 | | | | |
| 10165 | US10165 Architectural Drawing-commercial | 6 | 40 | | ✓ | 40 | | | | |
| 10166 | US10166 Architectural Drawing-multi story | 6 | 30 | | ✓ | 30 | | | | |
| 10167 | US10167 Evaluate the principles of | 6 | 15 | | ✓ | 15 | | | | |
| 10925 | US10925 Site Setout -commercial | 5 | 5 | ✓ | 5 | | | | | |
| 14599 | US14599 Site specific safety Plan | 4 | 5 | ✓ | 5 | | | ✓ | 5 | |
| COMS | Communications any | 3+ | 10 | ✓ | 10 | ✓ | 10 | | | |
| COMS | Communication writing | 3+ | 10 | ✓ | 10 | ✓ | 10 | | | |
| TOTAL | | | | | 245 | | 215 | | 20 | |
| | | Common to NDCM and NDQS (Optional) | | | | | | | | |
| | | Common to NDCM and NDQS (Compulsory) | | | | | | | | |
| | | Common to NDCM and NDAT | | | | | | | | |
| | | Common to NDCM, NDAT and NDQS (Optional) | | | | | | | | |
| | | NDCM only | | | | | | | | |
| | | Common to NDCM, NDAT and NDQS (Compulsory) | | | | | | | | |
| | | NDQS (Compulsory only) | | | | | | | | |
| | | NDAT only | | | | | | | | |

On this basis it was decided that the development of a total of 470 distinct credits, comprising 245 credits for the NDCM, 275 for the NDAT, 215 for the NDQS (Compulsory) and 20 for the NDQS (optional), would need to be developed as part of the Harmonisation programme.

A collaborative business (delivery) model

Definitions

The success of a collaborative business model depends on how well partners work together and the complementary skills, resources, talents *etc.* of each of the partners

(<http://www.canadabusiness.ca/eng/blog/entry/3507/>).

In certain environments, collaboration may be more difficult to achieve; it does not occur by simply putting individuals together and asking them to work collectively (Galagher, Kraut, & Egido, 1990).

Friend and Cook's (1992) definition of collaboration emphasises goal orientation: "Interpersonal collaboration is a style of direct interaction between at least two co-equal parties voluntarily engaged in shared decision making as they work toward a common goal" (p. 5).

Collaboration is further defined as "a process through which parties who see different aspects of a problem [or issue] can constructively explore their differences and search for solutions that go beyond their own limited vision of what is possible" (Gray, 1989, p. 5).

Approach

The essence of collaboration is the bringing together of professionals with a vested interest in the outcomes. In the case of the construction-related national diplomas, the impending changes to the national qualifications and the consequent investment required for providers to continue to offer the qualifications provided a catalyst for engaging in discussions about the potential for collaboration.

Leadership of the discussions requires considerable pre-meeting work with a discussion facilitator having a clear idea of what the possible collaborative options are.

The facilitator's role is to lead the discussion of the possible options, recognising the views of all participants while allowing a wide range of discussion.

Five collaborative options were identified. Each option was analysed to gauge the extent to which it meets operational imperatives.

Outputs

One collaborative model will be more advantageous when compared to others. Once that model is identified, then focus should shift to the planning for implementation phase.

Five possible models of collaboration were identified. They were:

1. status quo
2. shared resources contributed and shared development
3. resources contributed jointly and developed by The Open Polytechnic of New Zealand
4. resources contributed 100 *per cent* by The Open Polytechnic of New Zealand and developed jointly
5. resources contributed and developed 100 *per cent* by The Open Polytechnic of New Zealand.

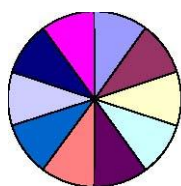
1. Status quo

This option involves no specific collaboration between ITPs and is in effect a continuation of the process that is currently used. Each ITP continues to develop, update, and maintain their individual resources.

2. Shared resources contributed and shared development

For this option, all ITPs pool their (shared) contributions towards the contents of all the unit standards in the current qualifications.

This is distributed among self-managing working groups to review, amend, update, and expand as necessary to achieve the most comprehensive range of developed resources possible.



Contribution

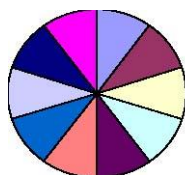


Development

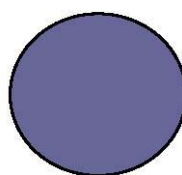
3. Resources contributed jointly and developed by The Open Polytechnic of New Zealand

The Open Polytechnic offers its current paper-based teaching courseware, covering all the unit standards in the current qualifications, as the initial base documentation and the remaining ITPs pool their shared contributions towards the contents of all the unit standards.

This information is distributed among Open Polytechnic-managed working groups (each comprising representatives from participating ITPs) to review, amend, update, and expand as necessary to achieve the most comprehensive range of developed resources possible.



Contribution

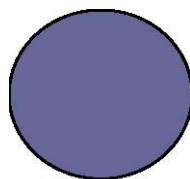


Development

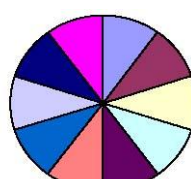
4. Resources contributed 100 per cent by The Open Polytechnic of New Zealand and developed jointly

The Open Polytechnic offers their current paper-based teaching courseware, covering all the unit standards in the current qualifications.

This information is distributed among the self-managing working groups to review, amend, update, and expand as necessary to achieve the most comprehensive range of developed resources possible.



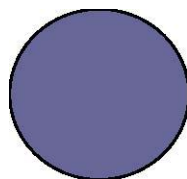
Contribution



Development

5. Resources contributed and developed 100 per cent by The Open Polytechnic of New Zealand

The Open Polytechnic of New Zealand offers their current paper-based teaching courseware, covering all the unit standards in the current qualifications, and reviews, amends, updates, and expands as necessary to achieve the most comprehensive range of developed resources possible. External Peer review would be sought.



Contribution and Development

Analysis tools for assessment of collaborative models

Each of the five options was evaluated under an analysis framework, which considered:

- time frame
- resources
- deliverables
- costs
- benefits
- risk assessment
- feasibility
- SWOT analysis
- Porter analysis.

Time frame

The time frame for delivery of the outcomes required work to be completed no later than the end of 2012 with shared resources being available progressively from late 2010.

Resources

The potential for each ITP to contribute staff, course and resource material, time and expertise in compilation of the shared resource material and development of it into its final stored form in the repository.

Deliverables

The availability of a shared resource comprising but not limited to a set of information in paper, electronic, web-based and multimedia formats, together with industry and product information, articles, brochures and data sheets.

Such information would be available for downloading by any and all participating ITPs' staff members. It would be updated and maintained by a joint body comprising participating ITP staff.

Costs

The analysis assumed a number of funding options ranging from no external funding to full external funding and options within those bounds.

Benefits

Benefits were assessed in terms of the:

- degree of collaboration required
- level of sharing of expertise
- level of resources required and available
- level of development costs for each (and all) ITPs
- flexibility of implementation required and available.

Risk assessment

This included identification and quantification of potential risks, and the required mitigation. Risk profiles were developed and then assessed using an Enterprise Risk Management (ERM) framework.

Feasibility

A practical assessment of the feasibility of each option.

SWOT analysis

This entailed analysis of the strengths, weaknesses, threats and opportunities of each option.

Porter Analysis

While ERM and SWOT analysis may show a particular option provides less risk (or at least more manageable risk) and more emphasis on strengths and opportunities than threats or weakness, it is useful to assess that option from an ITP strategic perspective, where the objective is to deliver a common, high-quality resource to ITPs for teaching students.

In essence, Porter Analysis provides a qualitative and quantitative evaluation of the (combined) ITPs’ strategic positioning by choosing firstly to collaborate, and secondly, to collaborate in the preferred option identified via the ERM and SWOT analysis.

Examples

The following examples illustrate specific components of the analysis framework used to assess each option. The tables and figures are extracts from a full analysis of each of the options and are presented solely to illustrate a particular approach rather than a detailed analysis of any particular option. Data included in the tables have been inserted for illustrative purposes and may not reflect the reality of any particular option. Some of the figures and information are not present as it is commercially sensitive information.

Costs

For each option, the total costs associated with development, including fixed costs and implementation, but excluding annual maintenance and updating costs, were estimated and apportioned across the potential collaborative partners:

| NorTec | Unitec | Wintec | WITT | BOPP | TOPNZ | WelTec | CPIT | Otago | SIT |
|--------|--------|--------|------|------|-------|--------|------|-------|-----|
| \$A | \$B | \$C | \$D | \$E | \$F | \$G | \$H | \$I | \$J |

The ongoing yearly update and maintenance costs were estimated separately and apportioned across the potential collaborative partners:

| NorTec | Unitec | Wintec | WITT | BOPP | TOPNZ | WelTec | CPIT | Otago | SIT |
|--------|--------|--------|------|------|-------|--------|------|-------|-----|
| \$K | \$L | \$M | \$N | \$O | \$P | \$Q | \$R | \$S | \$T |

An indicative cost summary, including measures of profitability (Net Present Value and Internal Rate of Return), was generated for each of the options:

| | Initial cost | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 |
|---|--------------|----------|----------|----------|----------|----------|
| Revenue (projected) | | (\$XXXX) | (\$XXXX) | (\$XXXX) | (\$XXXX) | (\$XXXX) |
| New course development | \$XXXX | \$XXXX | | | | |
| Course maintenance per year (5% of development costs) | | \$XXXX | \$XXXX | \$XXXX | \$XXXX | \$XXXX |
| Staff costs | \$XXXX | \$XXXX | \$XXXX | \$XXXX | \$XXXX | \$XXXX |
| Overhead costs (40%) | \$XXXX | \$XXXX | \$XXXX | \$XXXX | \$XXXX | \$XXXX |
| Total costs | \$XXXX | \$XXXX | \$XXXX | \$XXXX | \$XXXX | \$XXXX |
| Net income | \$XXXX | \$XXXX | (\$XXXX) | (\$XXXX) | (\$XXXX) | (\$XXXX) |
| NPV | (\$XXXX) | | | | | |
| IRR | XX% | | | | | |

Benefits

Benefits are defined in terms of the base values and “added values” inherent in proceeding with harmonisation. Those values may include aspects of cost, resourcing, industry expectations, delivery to students and resource material currency.

This was approached by identifying benefits and assigning numerical values to each according to impact associated with each collaborative option, noting that benefits may differ in content and impact between ITPs. For example, ITPs with significant resource shortages may identify a benefit of higher value to them than an ITP where resourcing is not an issue. The numerical values derived to express benefits by collaborative option were used as part of the overall comparison of collaborative options.

Benefits of harmonisation to ITPs included:

- reduced effort, cost and duplication in complying with the revised requirements for each diploma, which were formally in place in late 2010. These revised standards are currently in development under the direction of the BCITO
- cost-effective provision of best practice, flexible learning resources that are quality assured and maintained to the highest standards
- cost-effective access to a broad range of shared resources contributed by other institutes enabling the resources to be managed to suit the teaching requirements of each ITP
- links to industry sites that promote current best practice
- a regime whereby resource material will be updated and maintained centrally on behalf of all ITPs using input from a variety of sources. The proposed updating system will provide resources that are continually being reviewed and revised as construction technology changes

- a shared funding pool for future maintenance and updating space of resources
- retained flexibility as the initiative focuses on areas of synergy between institutions and does not attempt to impose a one-size-fits-all approach
- use of the shared resources will allow tutors to have more time available either for research or other workload opportunities.

Benefits of harmonisation to the Building and Construction Industry Training Organisation in particular and industry in general included:

- effective annual moderation activities that will be more straightforward and less costly given that common resources, regularly updated, becomes the base for teaching and learning
- consistency of teaching material
- raising the overall standard of each qualification
- ensuring that graduates are as “work ready” as is possible.

Benefits of harmonisation to students

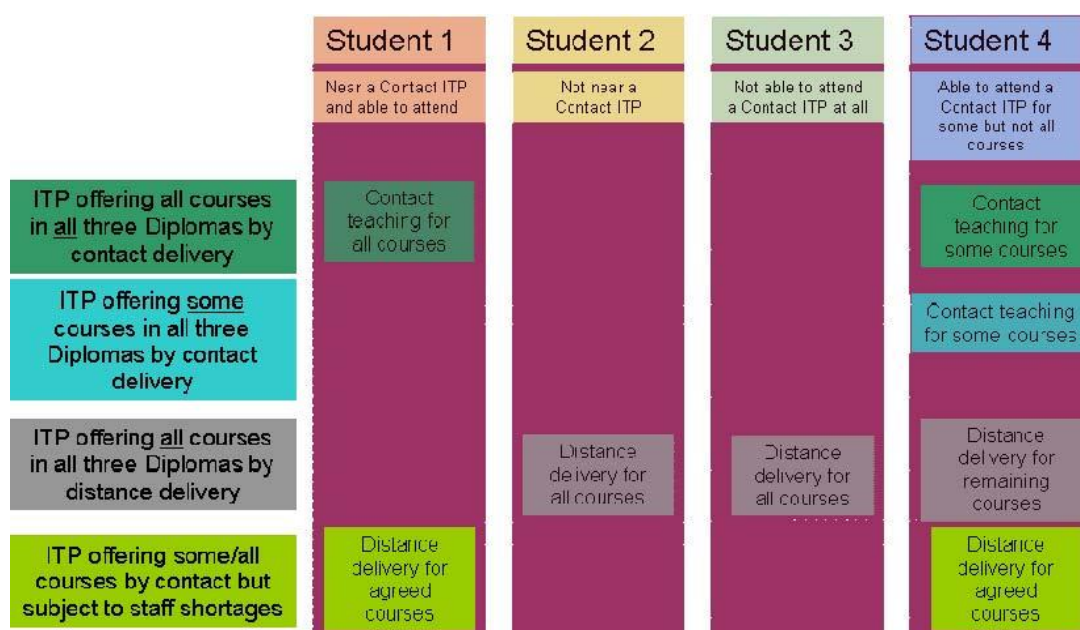
A key rationale underpinning the harmonisation Concept Case is the desire to allow students considerable freedom to choose where they undertake any part or all of their qualification.

For example, a student able to attend a contact institution for some courses but not others will be able to choose to study at their local institution and by distance from the Open Polytechnic of New Zealand without having to leave their geographical area.

This allows students not only to choose their teaching provider but also to retain considerable flexibility in doing so.

While this approach has already been in place for many years, the Harmonisation project was expected to ensure that, regardless of where or how the student studies, they will be studying exactly the same material in terms of content and currency.

The process is outlined below:



A further output of the benefits analysis was a high-level summary table illustrating the benefits associated with each collaborative option. The following is an excerpt from the summary table:

| Summary of benefits of each option | OPTION 1 | OPTION 2 | OPTION 3 | OPTION 4 | OPTION 5 |
|--|------------|---------------------------------------|--|--|--|
| | Status Quo | Shared resource and joint development | Shared resource and Open Polytechnic-led development | Open Polytechnic content and joint development | Open Polytechnic content and development |
| Collaborative Approach | | Y | Y | Y | |
| Closer link between ITPs | | Y | Y | Y | |
| Widest range of expertise | | Y | Y | Y | |
| Resources will be comprehensive, holistic and meet industry and students needs | | Y | Y | Y | |
| Single ITP has responsibility for managing and coordinating resource collation and development | | | Y | | |
| Benchmark for best practice resource set at higher level when shared | | | Y | Y | |
| | | | | | |
| Costs to the sector | Very High | Medium | Low | Medium | High |
| Benefits to the sector | No | High | Very High | High | High |

Risk assessment

A Risk Profile was developed for each of the five collaborative options. This involved describing each risk, assigning a value to the potential impact of the risk, and assessing the likelihood of the risk occurring.

Risk Impact is quantified as a value between “-5” (highly risky with a high negative impact on the desired outcomes) to “+5” (highly risky with a high positive impact on the desired outcomes).

Risk Likelihood is quantified as a value between “0” (probability of zero; it will never happen) and “1” (probability of one and is certain to happen).

The impact of a risk multiplied by the likelihood of the risk occurring provides an overall risk rating for a particular risk. The sum of the overall risk ratings provides an overall risk profile for an option. For example, the table below illustrates the overall risk profile for Option 1: Status quo (ITPs continuing to operate in isolation):

| Risk Description | Risk Impact | Risk Likelihood | Overall Risk |
|---|-------------|-----------------|--------------|
| ITPs may be unable to sustain the cost of updating the existing qualification/s and the continued maintenance. | -4 | 0.8 | -3.2 |
| The quality of the programme content may suffer through insufficient resources especially for small ITPs or those with limited resources. | -4 | 0.9 | -3.6 |
| Alignment to latest version of course and programme outcomes may suffer through insufficient resources. | -3 | 0.7 | -2.1 |
| Currency of resource is unable to be maintained due to fast changing construction technology requirements and | -2 | 0.3 | -0.6 |

| | | | |
|---|----|-----|-------|
| developments. | | | |
| ITPs may choose not to continue to offer some or all of the qualifications due to cost and time to update existing qualifications. | -4 | 0.9 | -3.6 |
| Teaching style and presentation methodology may fall behind the times and the technology causing resource and delivery standards between ITPs to diverge. | -1 | 0.3 | -0.3 |
| Overall Risk Profile of option | | | -13.4 |

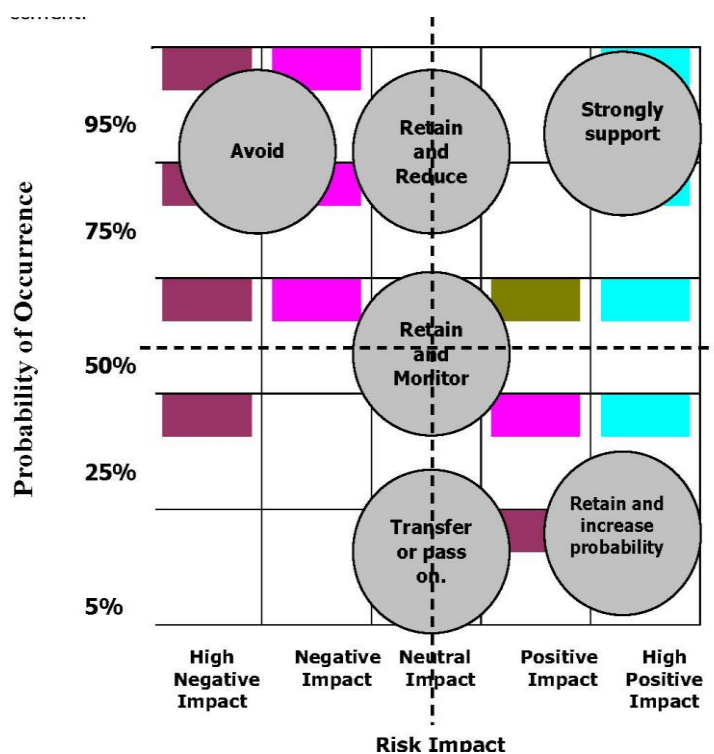
The Overall Risk Profile value for each option was normalised to provide a value of between -5 and +5. This normalised value was then used as a component of the overall comparison of collaborative options.

A Helliwell Enterprise Risk Management Framework was used to provide a risk assessment for each of the collaborative options.

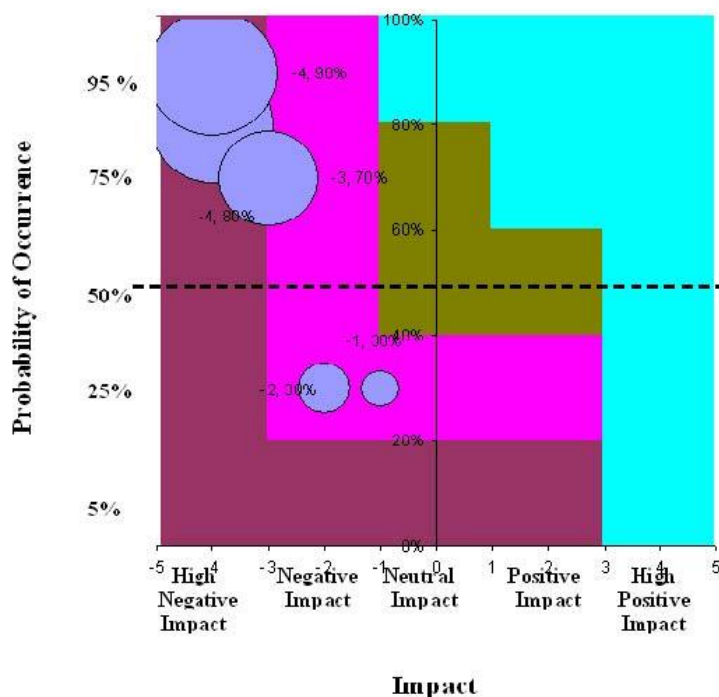
The Helliwell Framework allows decisions to be made based on the probability of a risk occurring together with the impact, either positive or negative, if it does occur. The key elements are:

| | |
|---|---|
| High probability and High negative impact | Avoid |
| High probability and High positive impact | Strongly support |
| Low probability and High positive impact | Act to increase probability of occurrence |
| Low probability and Neutral to High negative impact | Transfer out or reduce probability of occurrence |
| Mid probability and Neutral impact | Retain and monitor and be prepared to change position if input factors change |

This is shown diagrammatically below:



On that basis, an analysis might show (as in the following example) a high probability of occurring and a high negative impact, suggesting at least as far as risk is concerned, this option should be avoided.



A further output of the Risk Analysis was a high-level summary table illustrating the risks associated with each collaborative option. The following is an excerpt from the summary table:

| Summary of Risks by collaborative options | OPTION 1 Status Quo | OPTION 2 Shared resource and joint development | OPTION 3 Shared resource and Open Polytechnic development | OPTION 4 Open Polytechnic content and joint development | OPTION 5 Open Polytechnic content and development |
|---|------------------------|---|--|--|--|
| A proportion of the contributions may be difficult to quantify, balance and manage especially where different formatting and content structures are used. | | Y | Y | | |
| A single provider may not be aware of the various teaching strategies and required content to meet the needs of each ITP | | | | Y | Y |
| All ITPs are totally reliant on one organization for producing best quality resource for students | | | | | Y |
| Alignment to latest version of course and programme outcomes may suffer through insufficient resources. | Y | | | | |

Feasibility

A practical assessment of the feasibility of each option was carried out, with each option given a rating of between -5 (highly unfeasible in terms of achieving the desired outcomes) and +5 (highly feasible in terms of achieving the desired outcomes).

For example, the feasibility for Option 2: Shared contribution and shared development was given a rating of -1 as illustrated in the table below:

| Solution | Feasibility Rating | Assessment of feasibility based upon |
|--|--------------------|--|
| Shared contribution and shared development | -1 | Does this option achieve delivery of high-quality resources for each ITP in a cost-effective manner while ensuring that learning resources are maintained? <i>Compiling the elements of the shared resource is achievable and workable with appropriate management and oversight.</i> <i>Developing the resource on a shared basis is highly problematic due to resource constraints in all, but especially smaller, ITPs.</i> |

The feasibility ratings were used as a component of the overall comparison of collaborative options.

SWOT analysis

A SWOT analysis was carried out for each of the options. It is an analysis of the strengths, weaknesses, opportunities and threats associated with a particular option.

For each option, components were identified and rated from -5 to +5 to reflect their relative position on a continuum between strengths and weaknesses.

The sum of the component ratings were then averaged to give an overall assessment of the option in terms of its position on a continuum between strength and weakness.

SWOT analysis: Strengths and weaknesses

In the example below, an overall average of -2.8 was derived, indicating a relatively high level of strength. In a SWOT analysis, strengths have a negative value and weaknesses have a positive value. To enable comparability with other analysis tools, these values are given the opposite sign (negative to positive and positive to negative) for the purposes of the overall comparison of options.

| Component | Comment | Rank -5 to +5 |
|--|--|------------------|
| Resources to deliver on requirements: financial, intellectual, location, people | Strength as far as compiling the shared resource components but Strength in developing the resource. | -4 |
| Cost advantages from proprietary know-how | Strength. Collaboration in all aspects of the project ensures use of "know-how" from within sector to the benefit of all participating ITPs. | -4 |
| Competitive capabilities (against an external provider to the market) | Modest strength. Each ITP could compete in some areas in their regions against an external provider but small ITPs may be limited due to resource capability. Given a readily accessible repository of material which is current and easily accessible will provide a strong competitive buffer | -3 |
| Effective recruitment of talented individuals | Modest strength. Most ITPs would struggle to attract more qualified staff due to industry shortages and financial limitations, however with a high quality resource available, staff with less expertise can still teach effectively. | -1 |
| Overall average | Strength | - 2.8 |

SWOT analysis: Opportunities and threats

A similar exercise was carried out to give an overall assessment of each option in terms of its position on a continuum between opportunities and threats.

An opportunity is assigned a negative value and a threat a positive value for the purpose of the SWOT analysis. The sign of the overall average is then transposed for the purposes of the overall comparison of options.

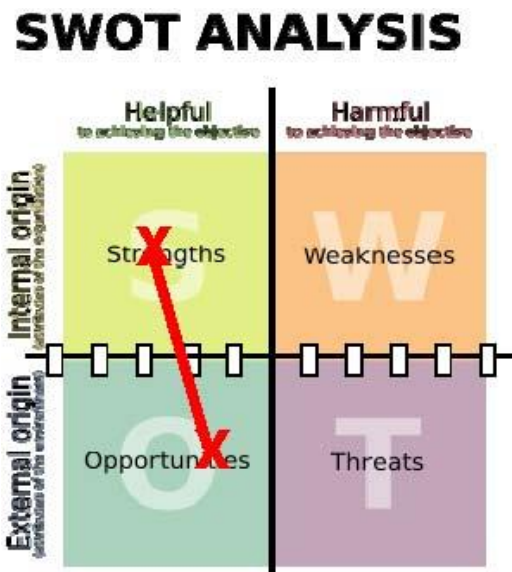
| Components | Comment | Rank -5 to +5 |
|--|---|------------------|
| Expansion or down-sizing of competitors | Opportunity. Any external competitor can be countered by availability of current, available repository, which can be used quickly. | -3 |
| Market trends | Opportunity. Elements of these diplomas are likely to form part of building practitioner licensing but opportunity may be hard to realise for small ITPs. Sharing of resources would provide strong base on which to develop. | -2 |
| Economic conditions | Opportunity. Increasing demand from industry for skilled practitioners especially in construction will create opportunities. There is a close correlation between industry upturn and national economy growth. Sharing of resources would provide strong base on which to develop. | -3 |
| Expectations of stakeholders including industry | Opportunity. See above but response may be limited by ITPs' capability and capacity; however, availability of resource material will demonstrate readiness to deliver to stakeholders expectations. | -2 |
| Technology | Possible threat. Online delivery will compete directly | +1 |

| | | |
|------------------------|---|-------------|
| | with major impact on smaller ITPs, but a shared resource will also provide some competitive edge. | |
| Overall average | Opportunity | -1.9 |

Analysis of SWOT data

As shown schematically in the diagram below, SWOT analysis shows this option falls on a line between a high level of strength and a very modest opportunity.

Based on SWOT analysis, this option is recommended.



Overall comparison of collaborative options

All factors from the analysis, with the exception of two financial factors, were normalised to conform to a scale from -5 to +5 where +5 is strongly supported or highly stable and -5 is strongly **not** supported or highly unstable. Financial factors associated with implementation and update were assigned a score of +1 to +5, with higher costs identified with a lower positive score and lower costs with a higher positive score.

The figures used do not have any absolute value meaning and are used only in a relative context. The figures for each option were summed to determine an overall figure for each option. The higher the (positive) overall figure, the more suitable the option is.

In the example below, Option 3 is the highest ranked option:

| Factor | <u>Option 1</u> Status quo | <u>Option 2</u> Shared contribution and shared development (resources and people) | <u>Option 3</u> Shared contribution and Open Polytechnic-managed development (resources and people) | <u>Option 4</u> Open Polytechnic contribute 100% and ITP-shared development (resources and people) | <u>Option 5</u> Open Polytechnic contribute 100% of resource and do all resource development (resources and people) |
|------------------------------|-------------------------------|--|--|---|--|
| Risk | -5 | -1.25 | +5 | -5 | -5 |
| Feasibility | -5 | -1 | +4 | -4 | -4 |
| SWOT (O(+) to T(-) axis) | +0.4 | +0.9 | +1.9 | -1.5 | -1.15 |
| SWOT (S(+) to W(-) axis) | -2.28 | -1.71 | +2.8 | -2.37 | -2.86 |
| Overall costs | -5 | +3 | +5 | +3 | -2 |
| ITP benefits | -5 | +3 | +5 | +3 | +1 |
| Student benefits | -4 | +2 | +4 | +2 | +1 |
| Implementation costs | +1 | +4 | +5 | +4 | +5 |
| Update and maintenance costs | +1 | +5 | +5 | +5 | +1 |
| Sum | -23.88 | +13.94 | +37.7 | +4.13 | -7.01 |

An overall comparison of collaborative options table and commentary formed a key component of the Concept Case for collaboration that was circulated to the 10 ITPs that participated in the analysis.

Also included in the Concept Case was a tabular summary of the different options by the attributes associated with one or more of the options. Its purpose was to provide a plain English summary of each of the attributes associated with the options, so that these could be compared 'at a glance' across all five of the collaborative options.

The attributes compared across each option included time frames, resources, process management, deliverables, costs, benefits, risk assessment, feasibility and the SWOT analysis. An excerpt from the Summary of Options by Attributes table is presented below:

| Summary of options by attributes | Option 1 Status quo | Option 2 Shared contribution and shared development (resources and people) | Option 3 Shared contribution and Open Polytechnic-managed development (resources and people) | Option 4 Open Polytechnic contribute 100% and ITP-shared development (resources and people) | Option 5 Open Polytechnic contribute 100% of resource and do all resource development (resources and people) |
|----------------------------------|------------------------|---|---|---|---|
| Time frame | N/A | From mid-2010 | From mid-2010 | From mid-2010 | From mid-2010 |
| Resources | N/A | Each ITP contributes resources for all phases | Each ITP contributes resources for all phases | Open Polytechnic for contribution phase and each ITP contributes resources in development phase | Open Polytechnic for all phases |
| Process management | N/A | All phases jointly managed | ITP actions in Phase 2 managed through Open Polytechnic | All actions in Phase 2 managed jointly | Open Polytechnic for phase 1 and Open Polytechnic ITP actions in Phase 2 |
| Deliverables | No change | Shared resources available to all ITPs | Shared resources available to all ITPs | Shared resources available to all ITPs | Shared resources available to all ITPs |

Reviewing the preferred option

Once Enterprise Risk Management and SWOT analyses have identified a preferred option that of all the options provides less risk (or at least more manageable risk) and more emphasis on strengths and opportunities than threats or weaknesses, it is useful to assess the preferred option from an ITP strategic perspective, where the objective is to deliver a common, high-quality resource to ITPs for teaching students.

In effect, this assessment of the preferred option provides a qualitative and quantitative evaluation of the (combined) ITPs strategic positioning by choosing firstly to collaborate and secondly to collaborate via the preferred option.

Porter Analysis was selected as the tool for reviewing the preferred option.

Porter analysis

A Porter analysis involves assessing the strategic impact of identified factors categorised within a framework comprising of five types of forces. These five overarching forces are:

- threat of substitute products
- threat of entry of new competitors
- intensity of competitive rivalry
- power of clients
- power of other providers.

Factors of potential impact were grouped under each of the five Porter forces as follows:

1. The threat of substitute products

The existence of products, including both physical (educational) products and educational services, outside the realm of the common product or competitive products, that increases the propensity of customers to switch to alternatives, which may arise due to:

- overseas qualifications
- entirely vocational qualifications
- online qualifications
- subsets of degree-level qualifications.

2. The threat of the entry of new competitors

Quality markets that attract students will tend to draw others into the area. This may result in new entrants, who have the potential to divide the market and consequently make any established provider less viable. This may arise due to:

- other New Zealand ITPs
- other New Zealand consortia
- New Zealand PTEs
- overseas tertiary providers
- online providers.

3. The intensity of competitive rivalry

For most industries, the intensity of competitive rivalry is the major determinant of the competitiveness of the industry. This is usually best addressed by creating sustainable competitive advantage through improvisation.

4. The power of clients

The bargaining power of students can in some circumstances be significant; it is in effect the ability of students to put the ITPs under pressure not so much as a group but within the group. It may arise due to:

- ITOs especially BCITO
- TEC
- NZQA
- students.

5. The power of other providers

The power of other providers can be significant where disagreement between providers becomes an issue. Provided collaboration is seen as positive by all ITPs, then disagreements are unlikely to have any significant impact. This power may arise from:

- other ITPs moving into distance delivery
- the Open Polytechnic moving into contact delivery
- a PTE moving into both areas.

Summary of Porter forces

The Porter analysis was carried out by developing a table listing the identified factors categorised under each of four forces. The “intensity of competitive rivalry” force was excluded, as the sole identified factor of “distance vs. contact” was considered low risk.

Each of the factors was assigned an impact rating between -5 (high negative impact on the desired outcomes) to +5 (high positive impact on the desired outcomes) and a probability of the factor having an impact. The probability was quantified as a value between “0” (probability of zero; it will never happen) and “1” (probability of one and is certain to happen).

Each impact rating was multiplied by its probability of occurring to derive a value of strategic impact. The sum of strategic impacts was calculated for each of the forces. The figures derived have relative significance only; they do not provide any absolute ranking. The higher the figure, either negative or positive, the greater the strategic significance is.

A sample summary of Porter forces is presented below:

| Threat of substitute products | Impact | Probability | Strategic Impact |
|--|---------------|--------------------|-------------------------|
| Overseas qualifications | -3 | 0.2 | -0.6 |
| Entirely vocational qualifications | -3 | 0.4 | -1.2 |
| Online qualifications | -4 | 0.7 | -2.8 |
| Subsets of degree-level qualifications | -4 | 0.3 | -1.2 |
| | | | -5.8 |

| Threat of new entrants | Impact | Probability | Strategic Impact |
|-------------------------------|---------------|--------------------|-------------------------|
| Other New Zealand ITPs | -4 | 0.7 | -3.2 |
| Other New Zealand consortia | -4 | 0.2 | -0.8 |
| New Zealand PTEs | -5 | 0.7 | -3.5 |
| Overseas tertiary providers | -3 | 0.2 | -0.6 |
| Online providers | -4 | 0.7 | -2.8 |
| | | | -10.9 |

| Power of clients | Impact | Probability | Strategic Impact |
|-------------------------|---------------|--------------------|-------------------------|
| ITOs especially BCITO | -5 | 0.1 | -0.5 |
| TEC | -5 | 0.1 | -0.5 |
| NZQA | -5 | 0.1 | -0.5 |
| Students | -1 | 0.3 | -0.3 |
| | | | -1.8 |

| Power of other providers | Impact | Probability | Strategic Impact |
|---|---------------|--------------------|-------------------------|
| Other ITPs moving into distance delivery | -5 | 0.5 | -2.5 |
| Open Polytechnic moving into contact delivery | -5 | 0.1 | -0.5 |
| A PTE moving into both types of delivery | -5 | 0.3 | -1.5 |
| | | | -4.5 |

In the above example, the highest risk is the threat of new entrants offering similar qualifications, particularly online, which would need to be considered in implementing the harmonisation project.

Once a preferred option for collaboration was identified, a further workshop was held with participating ITPs, where the collaborative proposal was revisited and reconfirmed with considerable further detail developed for the Concept Case on the implementation strategy and tactics.

Implementation of Harmonisation

The implementation strategy comprised two essential elements:

- implementation of a pilot programme comprising two courses within the diplomas that would serve to inform the subsequent full implementation
- implementation of the remainder of the courses within the three diplomas on a managed basis.

Specifically the pilot would:

- allow identification of issues that must be addressed before full implementation proceeds
- allow constraints to be identified and addressed
- allow implementation processes to be provided at modest cost to each ITP
- be more likely to attract external funding because of its smaller overall cost
- enable each ITP to be assured of the viability of the project.

The Concept Case was developed to a point where details of the collaboration for harmonisation were proposed. These included:

- how the collaborative relationship between the participating ITPs could be legally formalised
- a process for new ITPs joining the formalised collaboration
- how the ownership and management issues relating to intellectual property of the source materials and any resources created as a result of collaboration could be handled
- terms of use of the resources developed as a result of the Harmonisation Project, including a draft licensing agreement that was developed to illustrate how this could be formalised
- Harmonisation Project leadership, including a process for appointing a project leadership team
- project operating procedures
- membership of specialist implementation teams
- stocktake of the specific resources and expertise currently available through each participating ITP
- management of the pilot programme
- components of the pilot programme
- pilot programme implementation
- review of implementation of the pilot programme.

On completion of the pilot programme it was envisaged that a full review of implementation and outcomes would take place. This review would be led by the project leadership team but involve all participating ITPs.

The review would compare expected and actual outcomes and consider:

- all pilot costs
- strengths and weaknesses of the approach
- outcomes and expectations.

Licensing

The essence of the proposed option was joint ownership of the shared resources with a license from the collaborative entity to each individual ITP so they can use it for agreed purposes.

In effect licensing would be based on:

- the contribution of each ITP in sharing of its resources
- the contribution of each ITP in developing the resource (which includes provision of subject matter experts and EdTechs)
- all ITPs paying a licensing fee on a yearly basis for update and maintenance of the records, management of the resource system, minor expansion of repository systems and funding of the ITP committee secretariat responsible for managing operational processes.

Progressing from Concept Case to implementation

The Concept Case was circulated to the chief executives of the ITPs currently delivering programmes leading towards one or more of the national diplomas. In essence the chief executives were asked for:

- agreement in principle of the Concept Case
- a financial contribution to enable development of a full Business Case for the pilot programme and the full Harmonisation programme
- recognition that significant implementation resource issues need addressing for the full Harmonisation programme.

It was proposed that the chief executives of the participating ITPs would form a steering group, to which the Project Leader would report via the Chief Executive of the Open Polytechnic on a formal basis according to an agreed timetable.

Impact of system drivers on implementation

A key driver for the Harmonisation Project collaboration was the impending registration on the New Zealand Qualifications Framework of new versions of the National Diploma qualifications. During the period when the chief executives were considering the Concept Case, it became clear that new versions of the national diplomas would not be immediately registered due to a variety of factors, including timing of changes to qualification registration requirements and the launch of the New Zealand Qualification Authority's Targeted Reviews of Qualifications.

The delay in registration of the new versions of the national diplomas became protracted, and it was eventually decided to defer registering new versions of the qualifications until after the completion of the relevant Targeted Review of Qualifications scheduled for 2012.

This postponement of new versions of the national diplomas being registered effectively removed the need for immediate decisions to be made about Harmonisation-related collaboration, and instead shifted the focus firmly on the Targeted Reviews and the shape of the resultant National Diploma qualifications.

Benefits to date of Concept Case development

A significant benefit already realised from collaborative development of the Harmonisation Concept Case is that it brought together from across the ITP sector key people with a vested interest in the national diplomas. Beginning a conversation is a first step towards collaboration, and the discussions that led to the development of the Concept Case enabled cross-sector relationships to be renewed and/or established.

While the Harmonisation Project is on hold until the new qualifications are defined through the Targeted Review of Qualifications, the cross-sector engagement has endured and is now formalised as the Council for Built Environment Education in New Zealand (CBEENZ). The eight ITPs currently involved in CBEENZ are collaborating to enable a united approach to the targeted reviews relating to the three National Diplomas.

It is anticipated that the CBEENZ will also form the basis for collaboration on Harmonisation-related initiatives aimed at ensuring national, industry-supported and student-centred provision of programmes leading to the new national diplomas once these are registered.

The Future

The proposed Harmonisation Project remains an opportunity for:

- practical implementation of key strategies in relation to harmonisation of the construction-related National Diploma qualifications
- collaborative working between providers and between industry
- providers to enhance learner outcomes through sector efficiencies, and improved returns on investment covering over 700 EFTS collectively among participating ITPs.

Any shortfall or decline in the sector's capability to deliver these programmes will have a significant national impact, given the problems of leaky buildings which these programmes have a major role in addressing.

There is also a severe shortage of fully skilled and qualified technicians and professionals in these areas.

In addition, there is an increasing focus on two of these programmes that are directly linked to two Licensed Building Categories that become compulsory for the building Industry in 2012.

On that basis the reliance on current best practice teaching in these areas will become more critical with greater expectations and a Harmonisation Project would enable learners to be supported more effectively through:

- establishment of the foundations for a more flexible and constructivist approach to teaching and learning, as a website is set up to enable future learner access to a personal learning environment
- availability of best possible resources for building and construction qualifications offered by the ITP sector
- the future learning environment involving students directly accessing the web-based resource
- learners having a choice of where and how to study, knowing that wherever that is, the quality of resource material will be the same.

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