



Programme Design for an Online Learning Environment: Stories from Designing and Developing the New Zealand Certificate in Early Childhood Education and Care (Level 4) Programme

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Abstract

The New Zealand Certificate in Early Childhood Education and Care (Level 4) programme was designed and developed when a Level 4 early childhood education qualification became mandatory for all educators working with children and families in the New Zealand early childhood education home-based sector. This occurred at a time when Open Polytechnic was undergoing a transformational change programme to ensure ongoing innovation in open distant flexible learning (ODFL).

This paper provides insight into the design and development of a fully online, Level 4, early childhood education and care programme. Several “stories” focus on pedagogy that empowers learners in an online flexible distance learning environment, innovative teamwork, and initial feedback from stakeholders. The pedagogy underpinning the development of the programme is informed by the integration of sociocultural and constructivist theories with information communication technology (ICT), as specified by *The Pedagogic Model of Integrating Constructivist and Sociocultural Learning Principles with Information Communication Technology*, key educational design principles, and the assessment approach. In the first phase, work focused on designing at a programme level; work in the second phase developed the three courses that met qualification specifications set by the New Zealand Qualifications Framework (NZQF). The desired pedagogy and innovative teamwork resulted in very positive initial feedback from stakeholders. The paper recommends that feedback from stakeholders be formally collected in the new year.

Keywords: online learning; learning design; course development; early childhood; information technology; constructivism; sociocultural; education

Introduction

As a result of the review of home-based early childhood education (ECE), the New Zealand government decided that educators in the home-based sector would be required to hold at least a Level 4 ECE qualification (Kōrero Mātauranga, 2019). The Open Polytechnic (OP)—with a unique position in online distance flexible learning (ODFL)—designed and developed the New Zealand Certificate in Early Childhood Education and Care (Level 4) programme.

This programme comprises three courses:

- Early Childhood Practice for Children's Wellbeing
- Understanding Young Children's Learning and Development
- Professional Practice for Early Childhood Education and Care.

These 20-credit courses are fully online. To enrol in the programme, students need to volunteer or work in a licensed ECE service for at least 3 hours a week.

The ECE programme was designed and developed in the context of OP transformation and, together, our team constructed an innovative way to design it. The innovation had two aspects:

1. the theoretical framework underpinning the programme design
2. the process and way the team worked together.

The theoretical framework focused on scaffolding and ensuring the design of the ECE programme met the requirements of the New Zealand Qualification Authority (NZQA). Some important requirements for the design and delivery of the ECE programme were: the sociocultural theories underpinning the programme, the integration of learning and practice, and assessment in practice. These requirements were hard to meet, especially when the programme was to be delivered fully online without any face-to-face assessment or class interaction. The programme needed to empower learners in an online flexible distance learning environment. This required careful mapping to show how ICT as tools / artefacts would support learning.

In the context of the OP's transformation, the ECE programme was one of the first programmes developed in a new organisational structure. The team needed to create a new way of working that included developing processes to support successful design and development of the programme. A diverse group of people with different expertise, professional backgrounds, and experience in early childhood education, adult teaching and learning, and course design were brought together. Different perspectives and ways of thinking and working brought a breadth and depth to the development process that wouldn't have been possible otherwise. The shared vision of a programme of study was to respect, empower, educate, and upskill the students, and to advocate and support quality care and education in home-based ECE settings. This joint and shared vision sustained the team and enabled them to work constructively, collaboratively, and seamlessly throughout the project.

This paper shares our journey of design and development, which started with the theoretical framework underpinning the design and development of the ECE programme. The paper then follows our journey as the team continued with the process—using the framework and working together. We then relate stories from stakeholders involved in the design, development, and delivery of the programme. The stories describe some of the stakeholders' work, perspectives, and evaluative thinking. Finally, we share what we learnt from our journey; some of these findings may be useful in other contexts.

Pedagogy: Theoretical framework underpinning the programme

The design, development, and delivery of the programme were underpinned by sociocultural theories, woven with Te Whāriki, the national early childhood curriculum. (Te Whāriki is a bicultural curriculum underpinned by the principles of Te Tiriti o Waitangi. It is also an inclusive curriculum for diverse students.) Because this programme was developed for online learning, the integration of ICT and pedagogies was guided by the CSI model (Nguyen & Williams, 2016).

This section:

- explains the pedagogic model
- outlines the key educational design principles that guided the development of these courses
- presents the assessment approach underpinned by sociocultural theory.

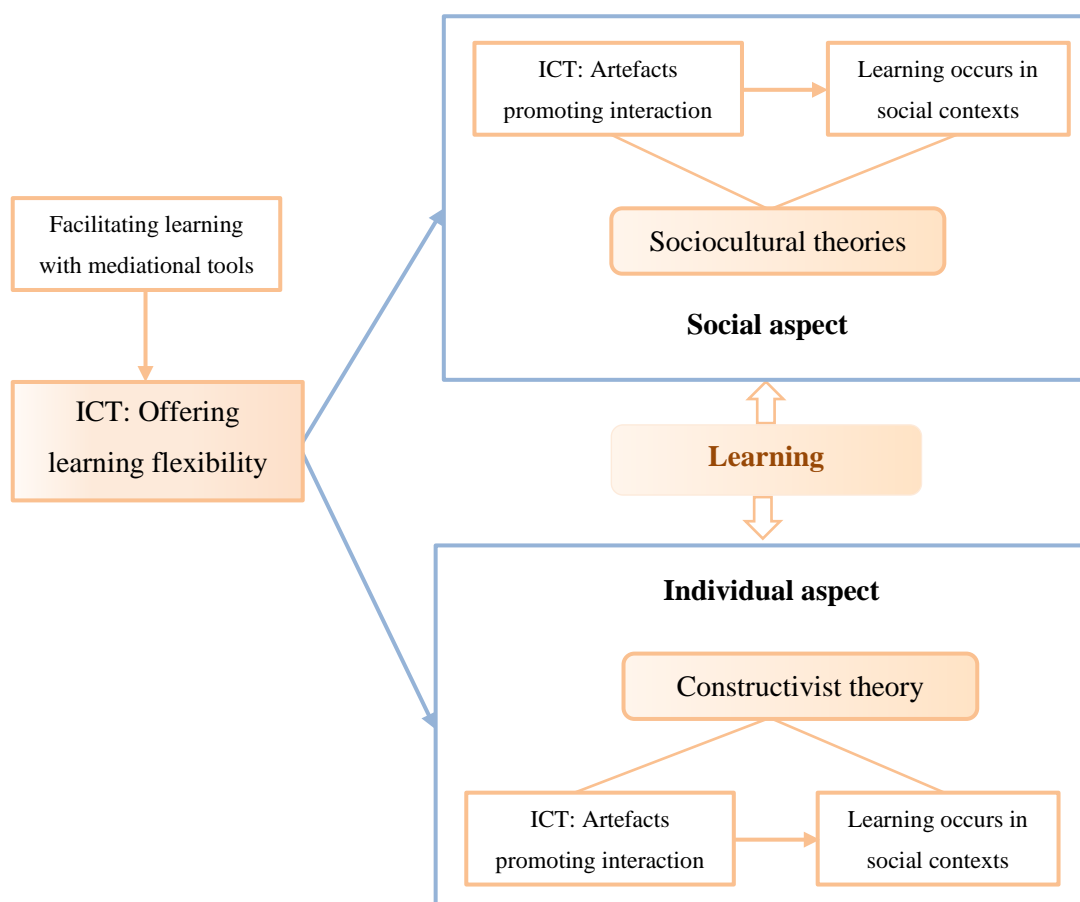
The CSI model

The relationship between learning and ICT is presented in Figure 1. The nature of learning can be explained by sociocultural and constructivist theories.

That is:

- Learning occurs in social contexts (sociocultural theories).
- Learning entails individual creation and organisation of knowledge (constructivism).

Figure 1 The pedagogic model of integrating constructivist and sociocultural learning principles with ICT (CSI model) (Nguyen & Williams, 2016)



From a sociocultural perspective, learning occurs in social contexts. Cognition (i.e., intelligence or knowledge) is distributed across social systems among people, learners, cultures, artefacts, environments, and situations (Pea, 1997; Salomon & Perkins, 1996; Salomon & Perkins, 1998). Learning is situated in contexts and activities.

Students learn by:

- participating in social organised activities
- interacting with people
- interacting with artefacts: tools, ICT and learning resources
- (Cobb & Bowers, 1999; Greeno, 1997; Salomon & Perkins, 1998).

Learning is facilitated with mediational tools such as signs, diagrams, virtual reality, language, experimental equipment, technical tools, and technology.

ICT tools can be used to:

- create social organised activities
- promote interaction between students and others in social networks, students and students, students and learning resources
- facilitate the co-construction of knowledge in social contexts (Bernacki et al., 2020)
- offer flexible learning environments for students.

From a constructivist perspective, learners create and organise their own knowledge in order to learn (Fosnot & Perry, 2005; Von Glasersfeld, 1989). As a tool, ICT can support learners to construct their knowledge and create multi-modalities of learning. Jonassen et al. (1998) noted that students internalise more information through a visual modality than they do through other sensory modalities. Visual tools (e.g., colours, photos, and diagrams), audios, and videos assist learners to internalise information effectively, and to construct their own knowledge. ICT can also give students opportunities to construct their knowledge in symbolic forms (such as words, diagrams, photos, videos, virtual reality) and organise their knowledge in structured systems (such as mind maps, structured folders, and databases).

Key educational design principles

To help the development team to incorporate the theoretical framework in course development and meet NZQA's requirements, key educational design principles were created. These principles, which were underpinned by the theoretical framework, outlined specific actions we needed to accomplish when developing the ECE courses. The key principles are listed below.

1. Sociocultural theories are integrated with ICT and underpin the design, development, and delivery of the New Zealand Certificate in Early Childhood Education and Care (ECEC) (Level 4) programme.

Key indicators are:

- designing learning activities that are based on the ECE context, and that require students to accomplish these activities in their own ECE settings
 - designing learning activities that require students to interact with artefacts (e.g., videos, course content on the iQualify learning platform, websites, reading) and to construct their own knowledge and skills
 - fostering student interactions that may be between students in online discussion activities, using question forms, with learning resources, with mentors / supervisors / academic staff and through tuakana (older / more experienced) and teina (younger / less experienced) relationships in the workplace (where tuakana help or guide teina).
2. The programme is underpinned by Te Tiriti o Waitangi and the New Zealand early childhood curriculum framework, Te Whāriki.

3. The programme is informed by inclusive pedagogies, and acknowledges our Pacific location and the diverse contexts of Aotearoa New Zealand.
4. Praxis is central to the programme, so practice–theory–practice are integrated (students work at least 3 hours per week at early childhood settings).
5. ICT tools are used as artefacts to support students' learning.
6. Key learning activities, assessment tasks, and processes are interrelated and embedded in practice. The collected evidence is cumulative, and provides evidence to show competency in practice.
7. Constructive alignment is ensured at course and programme levels.
8. Literacy and numeracy are embedded in the course content and learning activities.

Assessment framework

The “assessment in practice” approach developed for the programme by Dr Margaret Brennan is informed by cultural historical activity theory (CHAT) which is closely aligned with the sociocultural family of learning theories, and highlights the context and collective nature of learning, with an emphasis on what people do and think (Brennan, 2018). The assessment approach follows a learning cycle of “prepare, enact, reflect, query”.

Prepare

Professional practice activities are developed for each module so that both students and kaiako (educator) have time to prepare before learners participate in the setting. Activities align with course content and learning outcomes.

Enact

Each week students engage in professional activities and discussion in their early childhood settings to fulfil practice activity requirements.

Reflect and query

After leaving the setting, students record their participation in the activity and reflect on their experience. As part of the reflection students also develop a professional question or observation to discuss with their kaiako the following week.

Evidence / verification

Student participation in the practice activities is observed by kaiako, who verify students' hours in the setting, their participation in the practice activity, and that the professional discussion took place.

This assessment approach asks students to both enact and articulate their developing professional knowledge, skills, and dispositions in the early childhood setting. Importantly, this approach also provides evidence of students' ongoing opportunities to participate in professional activities and discussions with kaiako while in the early childhood setting.

Teamwork: Design and development

Underpinned by the theoretical framework, the design and development of the ECE programme commenced. The core team working on the design and development included a principal learning designer, a principal curriculum designer, an academic staff member, a project manager, a content creator, learning designers, digital designers, editors, and content reviewers (a Māori

appraiser, a content reviewer from the home-based sector, and a content reviewer from an early childhood centre). The team's work was divided into two phases: design and development. The design phase focused on the work at a programme level, while the development phase focused on the work at a course level.

A comprehensive sector review process was integral to the design and development of this programme. Each course received specific input from the ECE home-based sector and Māori practitioners. Their input at the early stages of development ensured that framework documents and course outlines accommodated desirable key learning and progressions while also meeting NZQA qualification requirements and strongly embedding the principles and strands of Te Whāriki. The sector review provided guidance for contextualising theory, ensuring the provision of strong, evidence-based practice examples, and the use of appropriate terminology. The sector review team also provided resounding support for the integrated programme approach, including assessment, which asks students to deeply interrogate their learning, work with complexity, and link theory to practice. We agreed that students should be viewed as competent, confident, and able to draw on their own experience.

The work of the team in the design and development phases is outlined below.

Design phase

The key work conducted at the design phase comprised:

- mapping the content and assessment (a six-step process shown in Fig. 2) facilitated by the principal learning designer, and conducted by the principal curriculum designer, academic staff, and principal learning designer)
- developing educational design principles (developed by the principal learning designer, reviewed by the principal curriculum designer)
- designing the assessment framework (developed by an expert).

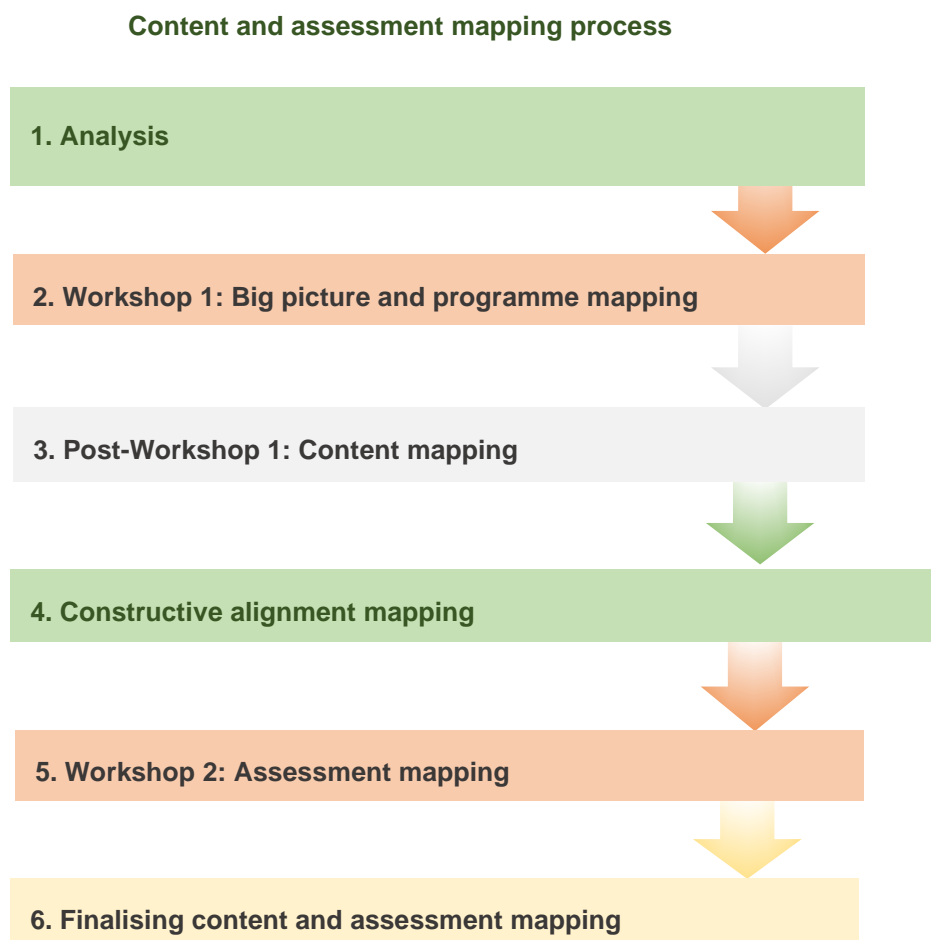
Six-step process of mapping the content and assessment

The mapping of the content and the assessment of the ECE programme is presented in Figure 2. This process has six steps: analysis, big picture and programme mapping, content mapping, constructive alignment, assessment mapping, and finalising content and assessment mapping.

In Step 1, the principal learning designer analysed information about the programme and prepared for Workshop 1. The work involved:

- analysing the NZQA descriptor (including graduate profile and conditions) and the academic case
- collecting and analysing information about the old programme (e.g., programme structures, information about students, passing and completion rates, stakeholders / employers)
- reading the content and assessments of the courses in previous and similar programmes
- brainstorming the educational design approach
- providing information and design tools / templates to support the team attending the workshop to:
 - brainstorm constructive alignment (learning outcomes–module content–assignment)
 - map the content of modules and assignments based on learning outcomes.

Figure 2 Process of content and assessment mapping at programme level



Participants in Workshop 1 (Step 2) included the principal curriculum designer, the academic staff member and the principal learning designer. The team discussed the programme, students, educational and assessment approaches, and overall content. They then used the template designed in Step 1 to brainstorm key content and resources that aligned with learning outcomes. This work prepared the principal curriculum designer and the academic staff member for content mapping in Step 3.

After the workshop (Step 3), the principal curriculum designer and the academic staff member continued to use the template document from Workshop 1 to work on content mapping for the three courses. The document was then sent to the principal learning designer.

When they received the document, the principal learning designer developed constructive alignment mapping (Step 4). Based on the principal curriculum designer's and academic staff member's work, the principal learning designer revised and added more content to the document, drafted descriptions of the assignments, and prepared for Workshop 2.

In Workshop 2 (Step 5), the principal curriculum designer, academic staff member, and principal learning designer discussed assessment and constructive alignment mapping. The team also reviewed and revised content mapping.

In Step 6, the principal learning designer finalised the content and assessment mapping document, including constructive alignment mapping at a programme level. The principal curriculum designer and ASM reviewed and agreed on the mapping.

After completing the ECE programme content and assessment mapping document, the educational design principles and the assessment framework in the design phase, the team moved to the development phase.

Development phase

In the development phase, the ECE development teams created and designed the content, learning activities, and course assessments based on the programme content and assessment mapping, the educational design principles, and the CSI model.

The principal learning designer led learning designers in designing three ECE courses. She facilitated workshops, reflective conversations, and reflective activities so the learning designers could continuously reflect on their work and the course material in light of these educational design principles. She reviewed the courses, gave constructive feedback and guidance to the learning designers at the early stages of course development, and signed off the online courses when they were completed.

The learning designers coordinated the work at a course level. They designed the online courses, liaised with course team members (e.g., the content creator, bicultural appraiser, reviewers, digital designers, editors) to ensure the work flowed smoothly. They also received feedback from the principal curriculum designer, the academic staff member, and the principal learning designer, and revised the online courses based on the feedback.

The principal curriculum designer worked closely with the principal learning designer, the content creator, the academic staff, and the team to provide guidance and support. She reviewed the online courses to ensure the quality of the programme. The principal curriculum designer was responsible for the final sign-off.

The content creator of these ECE courses was a renowned scholar and expert in the ECE field. Working with the team, and guided by the content and assessment mapping document, she created the content, learning activities, and assessments. The sociocultural theories underpinned the design of learning activities (e.g., professional practice activities that required students to implement theories in their practice, interact with kaiako in the ECE setting, and participate in online discussion with peers and lecturers). The content creator noted that the requirement to dispense with a set text made the writing process more time consuming and complex, because of the need to rework information previously found in set texts, particularly when similar material was not available in web-based readings.

The project manager managed the course development. She made sure the work ran smoothly, minimised risks, and solved problems. She provided support, liaised with the business owner and the business sponsor, and managed the budget and timeline.

Every team member was well qualified and experienced in their area of work. They showed a strong passion for their work and worked professionally, collaboratively, and constructively until all three courses were completed. Their experience in course design and development contributed to a programme of study that was well received by the sector. The stories below provide more insight into the experience of individual team members.

Stories

In this section we share stories from the academic staff member, the project manager, and the learning designers who were involved in the design, development, and delivery of the programme. The stories are a snapshot of their work and perspectives.

Academic staff's work and initial feedback from students and employers

The academic staff member in this programme was very experienced in early childhood teaching grounded in sociocultural theory and guided by Te Whāriki, a bicultural curriculum that “holds the promise that all children will be empowered to learn with and alongside others by engaging in experiences that have meaning for them” Ministry of Education, (2017, p. 13). This staff member saw a high level of congruence between the theoretical framework and design and development principles that underpinned the design and development of the New Zealand Certificate in Early Childhood Education and Care (Level 4), and her own teaching and learning philosophy.

The academic staff member also needed to ensure that the course design considered the students' needs by, for example, enabling students to:

- balance study with work and family commitments
- use prior knowledge and skills as tools for learning
- construct knowledge and understanding through carefully designed learning experiences and resources
- actively participate in an online community that embraces the Māori concept of *ako*, where learning and teaching is reciprocal—resulting in both teacher (facilitator) and learner contributing to the learning process.

At points throughout the development process the academic staff member provided feedback that ensured student characteristics, experience, work, and life contexts were understood by the content creator and development team. Feedback was given on the organisation, flow of learning experiences, and the scaffolding needed to support students in familiarising themselves with the course structure, resources, and requirements. An example of this was ensuring the programme design met the practicing requirements of educators working in a range of early childhood services (e.g., home-based education and care, playcentre, certificated playgroups, education and care centres, and licensed hospital-based education and care services). This was achieved by adopting “assessment in practice” which enabled students to engage in professional practice that included supervision and assessment of learners' skills and competence in authentic ECE settings.

The academic staff noted:

This approach to assessment is proving to be very successful, with students discovering the highly contextualised complex nature of their work with children and whānau and how it is informed by theory.

Most of the students in this programme were very motivated because the long-term sustainability of employment of home-based early childhood educators depended on their gaining a Level 4 early childhood education qualification (Brennan, 2018)

Early childhood educators coming into the programme were often apprehensive about studying online because they had limited access to technology and the internet, and limited computer experience and engagement online. They clearly articulated a preference for hard-copy learning materials. In spite of these barriers, early childhood educators thrived as students in the online

environment. All new students received learning mentor support to navigate the online course—the first such contact was made 2 weeks before the course started, and support continued for 4 weeks. According to Gilly Salmon (2013), this first stage of the learning journey helps with the transition to online learning. It was evident that a personalised experience breaks down the feeling of apprehension and uncertainty about studying online and sets the students up for successful flexible distant online learning.

The academic staff member / facilitator created a friendly, supportive communication style. She began with introductory and icebreaker activities in which learner and facilitator introduced themselves and were invited to share one thing they hoped to learn from the course, and one thing they thought would be a challenge. These activities generate student interaction and online “socialisation” as students connect with others’ experiences. She was amazed at the depth of experience and passion amongst students. This socialisation, which provided a good foundation for more structured, informative exchange, was an important stage in their online experience. Later they engaged in the course content and discussed their understanding online in discussion activities and talk channels.

The academic staff member believed her teaching presence was critical for students retaining momentum in their study. Her teaching presence was reflected in emails and phone calls with individual students. Weekly course announcements guided and supported students throughout the course. These announcements added dynamism and vitality to the course, and made each course offering relevant to the particular cohort of students. Announcements generally highlighted important content, summarised online discussion, and provoked more in-depth thinking and reflection. They consolidated links between theory and practice, encouraged students to revisit prior learning, and acknowledged their collective effort and progress.

The academic staff member shared her observation on the effect of this ECE programme on students:

It is clearly evident that students in this programme of study are becoming increasingly independent and responsible for their own learning, more self-reflective and computer savvy. I believe one of the most important outcomes of the programme is the depth of professional knowledge and understanding that has enriched the practice of early childhood educators enrolled in this programme. It is evident to me that there is a renewed appreciation of how important the role of early childhood educator is to the lives of very young children. From written assignments and documentation of practice, I see that most feel they are privileged to be involved in the education and care of young children and their families and carry out their work with great pride and enthusiasm. I also see that students’ perception of themselves as competent, confident students capable of taking on the challenge of the next course has increased over the course of their study.

Although there was no evaluative student data available for this programme at the time of writing this article, the academic staff member noted that she had received positive feedback from students and employers. She received much appreciation and many thanks from students and employers for her support for students. For example, the academic staff member said students appreciated that she always encouraged them through the talk channel, motivating them to find their potential. The academic staff member shared that one employer was very proud of the students’ achievements and the amazing growth of these individuals, and thanked her for her support.

Project manager's reflections

The project manager was responsible for projects that developed new, or redeveloped existing, educational programmes. One of the project manager's main tasks was to manage risks. The highest risk on this project was finding a suitable content creator / subject matter expert who could create content reliably and in very tight timeframes. Having a tight timeframe was another big risk, because the old programme was expiring and the Open Polytechnic needed to offer the replacement programme promptly.

In the project manager's view, several factors contributed to the successful completion of this project.

- In the design phase, the principal learning designer, the principal curriculum designer, and the academic staff member developed the content and assessment map to set up the framework and principles and to guide the programme development. Gaining agreement between representatives of parts of the organisation on the direction of the development ensured we didn't face additional delays in the development stage. The content and assessment map was available to all course development teams as a constant reference point throughout the development phase.
- After an initial delay, the team managed to secure the services of a very experienced and highly respected subject matter expert / content creator who wrote all three courses.
- Sector reviewers' and bicultural appraisers' immediate feedback on the draft content gave us confidence that what we were developing was relevant for the sector and for our diverse students.
- Input from the academic staff member at stages of the development gave us confidence that we were not only developing relevant content but we were designing it to support the delivery to a specific level of students (at Level 4 on the NZQF).
- Learning designers were ready to step in and provide additional guidance and support whenever necessary.
- When issues inevitably occurred, we had a supportive project team of professionals who focused on understanding the issue and finding a swift solution.
- We were able to manage and mitigate risks throughout the project, presenting available options and recommendations to support timely decision-making at project governance level.

Learning designers' feedback

Feedback from learning designers who worked intensively on developing the ECE programme was very positive. According to these learning designers, the content and assessment mapping was invaluable. It provided a clear roadmap for the project team to develop the course, and allowed them to focus on the required instructional design elements. Completing the content and assessment planning upfront was also a reason for development being completed 1 month ahead of schedule and well within the allocated hours for the project.

Thanks to this brilliant piece of work [upfront content and assessment mapping] being undertaken, it set the scene for the rest of the development. Every programme should do the same.

The initial planning meeting (where members of the core project team attend a 1-day planning session to plan a course in detail) was one of the best planning meetings I had been involved in thanks to this work being completed at the programme level and prior to course development beginning.

The educational design principles were highly appreciated by the learning designers. One learning designer shared her thoughts:

The educational design principles that were established for the programme also provided an excellent opportunity to really reflect on the work I had done throughout the development.

The learning designers who worked on the ECE programme appreciated constructive, strength-based and high-trust teamwork. They said they had very positive working experiences. One learning designer said:

When I think about working on this program[me] the following emotions and feelings become explicit:

- professionalism
- respect
- knowledge
- trust
- friendliness

This way of working provided the learning designers with opportunities to work in a team that behaved with professional integrity, trusted each other, and respected each other's knowledge areas—thereby creating a supportive and friendly work environment. According to them, the reviews and sign-off of the courses were done in such a manner that they did not feel intimidated, but experienced another learning opportunity.

I loved the fact that I was learning. I could be creative and implement new [learning design] solutions. The support I received made it possible for me to feel as though I am part of the team even though I am not on site.

The learning designers' positive working experiences were also reflected in their appreciation of other team members.

It is amazing to have the DX [Digital Experience] team on hand for all complex development.

The work done by . . . Copyright Clearance is also a critical part of this process. She gives peace of mind.

A project manager that understands the project, stakeholders, and content is key to success.

As well as providing this positive feedback, the learning designers suggested:

I would love to hear more about the feedback received from the students.

Having multiple editors over the various courses makes the transfer of knowledge difficult. I think part of the editor's briefing—if they work on a programme with multiple courses—should be to update the stylesheet to reflect how they have worked and what needs to be transferred to the next course.

In general, they had strong confidence in the quality of these ECE courses.

I have no doubt that the quality is of a high standard. The rigorous review process making use of various reviewers and thus ensuring that the quality is of the standard required. Making use of a respected and well-versed author ensured the quality of the subject matter and this will eventually impact on the word-of-mouth perceived value and quality of the programme.

Conclusion

This paper shared our stories of designing and developing the New Zealand Certificate in Early Childhood Education and Care (Level 4). Underpinned by the CSI model, the key educational design principles and the assessment approach, the design and development of the programme were completed effectively and efficiently. Team members had a very positive working experience, and initial feedback from students and employers showed great appreciation. Reflecting on the success of the ECE programme design and development, it is suggested that some of the key factors that contributed to this success could be used in other contexts.

These key factors are:

- upfront content and assessment mapping at a programme level, underpinned by the theoretical framework, which is specified by educational design principles and the assessment framework
- constructive, strength-based and high-trust teamwork, guided by innovative work process that was constructed by the team
- a highly qualified, experienced, expert, dedicated team of principal educational designer, principal curriculum designer, project manager, content creator, educational designers, the academic staff, reviewers, digital designers, and editors.

In February 2020, there were 226 students enrolled in this programme. Although the initial feedback was positive, it is suggested that feedback from students, employers, and alumni should be formally collected to support the ongoing improvement of the ECE programme.

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Hanlie Ippel is a learning designer currently employed by Open Polytechnic of New Zealand. She has degrees in archaeology, information science, and library & information studies, and an MIS. She has many years' experience in e-learning, online learning, and blended learning development. Her experience was gained locally and internationally.

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Mel Boyd is an academic staff member at Open Polytechnic, where she teaches digital literacy, communication for learning, and social and health studies. She holds qualifications in adult teaching, adult literacy and numeracy, and e-learning and digital technologies and has taught in fields that include business administration, communication, and foundation and bridging learning. In recent years, her role as an educational designer has enabled her to delve into her passion for writing and designing technology-enabled courses and programmes.

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