

A Framework for Mixed Stakeholders and Mixed Methods

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Abstract: Balancing stakeholder expectations and requirements is frequently a challenge for the ethical researcher contracted to evaluate government-funded community projects. Invariably these projects involve people from diverse backgrounds with their own agenda and expectations for the project. This was the scenario for adopting a mixed-method evaluation of Wellington's Smart Newtown community computing project where free Internet access as well as some computer skills training was made available at the newly-established computing centres. The four-year, multiple stakeholder evaluation project involved qualitative and quantitative approaches, situated within a five-purpose conceptual framework of: triangulation, complementarity, development, initiation, and expansion. The framework provided a robust platform that ensured a systematic and thorough approach in both collection and analysis of data. In this paper we describe the application of each "purpose" of the framework to the different data sets that resulted in an objective, impartial evaluation which was subsequently used for deciding future directions of publicly-funded community computing centres.

Keywords: Mixed method, evaluation, community computing, triangulation

1. Introduction

The acceptance of difference and representation of the diverse perspectives of multiple partners and stakeholders engaged in a research evaluation project can be a difficult task for the researcher contracted to conduct an independent evaluation. Invariably the projects involve people from diverse backgrounds; some will be the target recipients of the completed project, others will represent community interest groups and trusts, local and national governments and corporations. Each group brings its own agenda and expectations as to the outcome of the evaluation and will differ in their abilities to promote their views and being heard.

A strategy to achieve a balance so that a greater diversity of divergent views are heard, questions are answered that other methodologies cannot, and stronger and better inferences are provided (Teddle & Tashakkori, 2003), is to use a mix of qualitative and quantitative methods. Many social science research projects have adopted a mixed method design and in recent years this approach has also gained acceptance in business and information systems research (Bryman & Bell, 2007; Trauth, 2001). However, there is a need for "a clear differentiation of alternative purposes for mixing qualitative and quantitative methods" (Greene, Caracelli, & Graham, 1989, p. 255) and clarity of understanding of why we use mixed methods (Teddle & Tashakkori, 2003).

In this paper we describe how Greene et al's (1989) five-purpose conceptual framework was applied to the mixed-method design of a longitudinal evaluation of the Smart Newtown Project. This New Zealand digital divide project involved the establishment of five computing centres in Newtown, a low socio-economic suburb in New Zealand's capital city, Wellington. The centres variously provided computers in homes, free Internet access and free introductory computing lessons. The goal for the two-stage, multiple-partner project was to narrow the digital divide for groups identified by the New Zealand government as likely to be excluded and disconnected from an information society (Servon, 2002). These groups include Maori and Pacific peoples, those on low incomes, sole parents, older people, people with no or low qualifications or poor literacy, and the unemployed (Connecting Communities: a Strategy for Government Support of Community access to Information and Communications Technology, 2002). The Newtown suburb has a high representation of these groups. The focus was therefore on the community sector, identified in the New Zealand's Digital Strategy ("The Digital Strategy: Creating our Digital Future," 2005) as one of the three "agents of change" necessary for raising people's awareness of the potential of information and communications technology. The next section backgrounds the Smart Newtown evaluation.

2. The Smart Newtown study

Smart Newtown's five community computing centres were established at different locations within Wellington's Newtown suburb. Free computing facilities and Internet access were provided on a drop-in basis and at two of the centres introductory computing lessons were available. The periods of operation in terms of remaining open to the community varied and at the time of writing just one centre remains open.

The aim for the Smart Newtown Project was to narrow the digital divide and had specific objectives of:

- Improving educational achievement and interest in participation in further education
- Improving short and long term employment prospects
- Developing ICT skill levels among disadvantaged groups
- Enhancing economic and social benefits for the wider community
- Strengthening intra-family relationships and cooperation
- Extending social networks and greater community interaction
- Improving opportunities for residents' expression of cultural heritage
- Improving flow of information between home and school.

The project was based on a partnership model with stakeholders representing the Wellington City Council, the Wellington Regional Economic Development Agency (WREDA), Wellington Region 2020 Communications Trust, three tertiary education institutions, Fujitsu New Zealand Ltd, community organisations and volunteers and members of the Newtown community. WREDA and Massey university funded the evaluations and Fujitsu financed a computer centre in the Newtown Park Flats (a six-block, council-subsidised, high-rise apartment complex).

A cooperative relationship was envisioned between people or groups who agreed to share responsibility for achieving the project's goals. While representatives of each stakeholder group were united in a commitment to the success of the project (to a greater and lesser extent), each had his/her own reasons for engaging with the project. As well, they had varying responsibilities and accountabilities and they brought with them their own perspectives and backgrounds that framed their expectations of the project.

For the evaluation two principal manifestations of this partnership model were first, the commercial, contractual aspect where the researchers were 'employed' to undertake research on behalf of the funder (WREDA). The second was the development of collaborative, iterative partnership processes between the researchers, individuals and groups within the Newtown community, employees of Fujitsu New Zealand Ltd, a multi-national corporation, and stakeholders who included individual computer users within the Newtown suburb and visitors from outside the community. Figure 1 shows the diversity of the stakeholders.

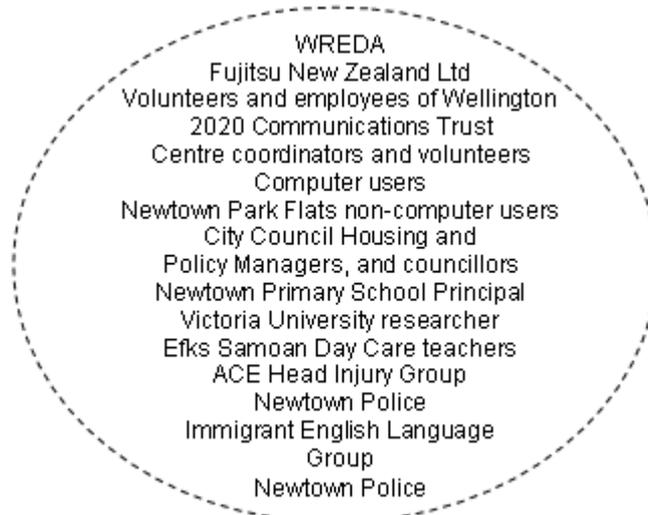


Figure 1: Stakeholders of the Smart Newtown project

Evaluation of the project was in two stages: the 18-month Pilot Project followed by the second 30-month Post Implementation Review. To capture data that would contribute to a meaningful and useful evaluation as well as adopt appropriate data collection methods for eliciting information from such disparate groups a research design that used mixed methods involving qualitative and quantitative approaches was used. Creswell and Clark (2007) recommend the use of a notation system and visual diagrams to communicate the "complexity inherent in mixed methods designs" (p. 40). We have used Ivankova, Creswell and Stick's (2006) Visual Model for Mixed-Methods Sequential Explanatory Design Procedure to show the phases, procedures and products involved in our mixed-methods design but have included a fourth column that describes the "Sample" (see Figure 2). The centres operated on a drop-in basis and it was therefore impossible to define a "population" from which to draw a sample. Potentially the population was the entire Newtown community.

The Visual model follows Ivankova et al's "Ten Rules" (p. 15) for drawing visual diagrams that include limiting the diagram to one page, using capitalized or lowercase letters to designate priority of quantitative and qualitative data collection and analysis, drawing boxes for the collection, analysis and interpretation of results and use of concise language.

Figure 2 shows that over the four-year period two surveys were conducted. First, the User Survey was developed and administered over the early months of the centres' operations. The low response rate for users of one centre prompted the development and administration of a second survey, that targeted the residents of the high-rise flat (apartment) complex. This we termed the Non-User Survey.

Qualitative approaches included participant and non-participant observation, numerous formal, informal semi-structured interviews, focus groups, and casual "conversations" that occurred during observation at the computing centres. These "conversations" were particularly suited, as a data gathering approach, to the immigrant English language group and the head injury group where formal communication was difficult and structured interviews could be viewed as intimidating. Computing users e-mailed anecdotes of their computing experiences. The variety of data gathering approaches suited a stakeholder sector that would otherwise not have had a voice in the evaluation. At least one of the three researchers attended the monthly communication meetings where documents relevant to the project were tabled and these, together with Memoranda of Understanding between Fujitsu and the Wellington City Council, minutes of meetings, the user registration and attendance log contributed to the data collection.

The components shown in the visual model (Figure 2) are helpful in understanding the mixed methods design for the Smart Newtown Project. The phases and procedures of the design were guided by Greene, Caracelli and Graham's (1989) five-purpose conceptual framework for mixed method evaluation which are described in the next section.

Phase	Procedure	Product	Sample Description
Quantitative (Users) Data Collection	Paper-based survey (n = 118) Centre co-ordinators and researchers administered survey	Numeric data	Computer centre users; most, but not exclusively, from Newtown suburb.
1 st Qualitative Data Collection	Observation (n = approx. 32) Development interview questions 6 Interviews: purposeful selection 23 Conversations	Text data (interview transcripts and notes, environment description, computer room typology)	Computer users, Centre coordinators, volunteers Fujitsu employees: management and technicians City Council housing representatives and councillors
Interim Analysis of User Quantitative Data	Low response rate initiated early analysis and decision to develop and administer survey to non-users of Newtown Flats' centre.	32 usable surveys. Descriptive statistics	Majority of computer users from one centre.
Quantitative (Non-users Data Collection)	Face-to-face survey (n = 125 non-users)	Numeric data	Population = 159 residents then living in the Newtown Park Flats where one of the computer centres was located.
Quantitative Analysis of Data	Excel statistical functions	Descriptive statistics	As above

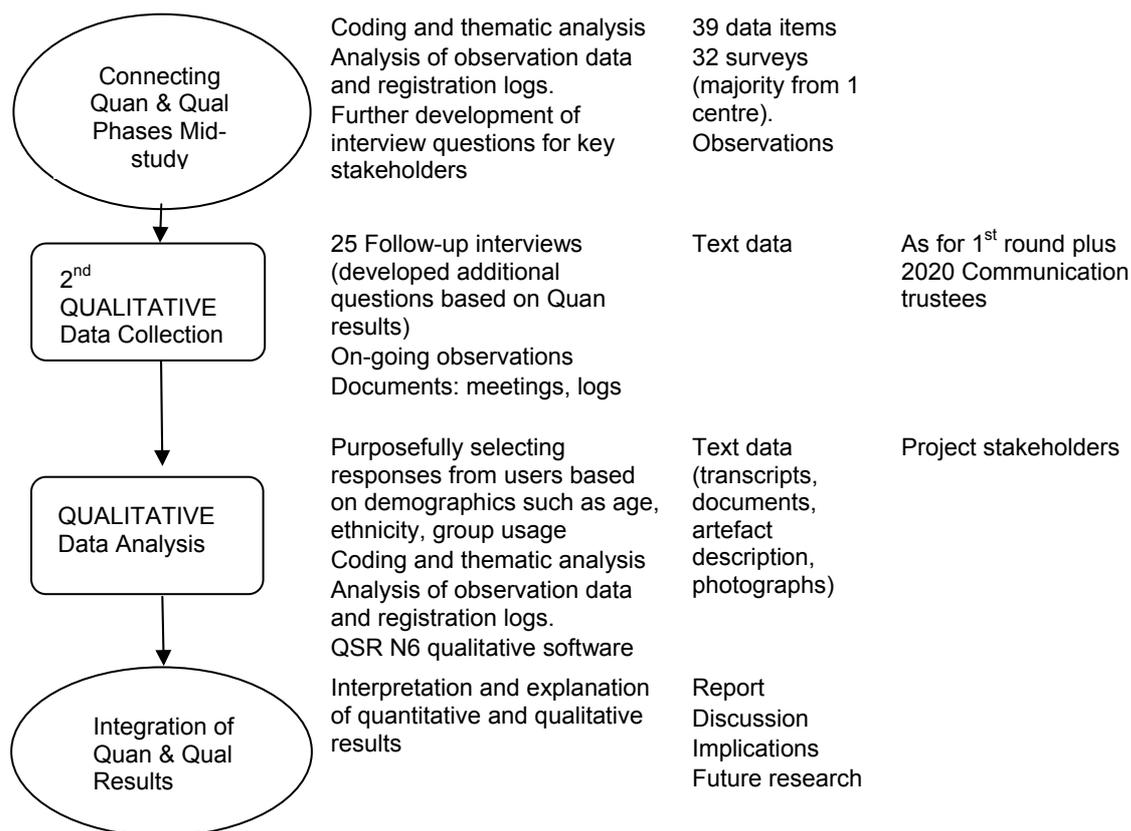


Figure 2: Visual model for the Smart Newtown Project mixed methods design: sequential explanatory design procedures (after Ivankova, Creswell & Stick, 2006).

3. A supportive framework

After analysing 57 mixed method evaluations Greene, Caracelli and Graham (1989) developed a conceptual framework describing how mixed-method evaluation may be used. This framework is based on the similarity of the methods used, the phenomena researched, the paradigms used, the status applied to each method, the timing of the individual methods and whether they are implemented independently or interactively. The five purposes of mixed-method designs are Triangulation, Complementarity, Development, Initiation and Expansion.

Triangulation is achieved by intentionally using more than one method of gathering and analyzing data about the same phenomenon in order to seek convergence and corroboration and to eliminate the inherent biases from using only one method (Denzin 1988; Greene et al. 1989). Such methods should be implemented simultaneously and independently to provide triangulation. Complementarity seeks elaboration, enhancement, illustration and clarification of the results from one method with the results from the other method. Thus quantitative and qualitative results are used to measure overlapping but different phenomena. It is best undertaken when each method is implemented interactively and simultaneously. Development uses the results from one method to help develop or inform the other. Here, each method is implemented sequentially and the results from one method, for example interviews, may be used to develop a questionnaire to assess the same phenomena. Initiation looks for paradox, contradiction and new perspectives in the hope of discovering why such contradictions exist. It requires an iterative approach and Greene et al (1989) suggest that "mixing paradigms in this design is acceptable and even encouraged" (p. 268) because of the ability to maximize the possibility of discovering inconsistencies. They suggest that "purposeful initiation" (p. 268) is probably uncommon. Expansion seeks to extend the breadth and range of inquiry by using different methods for different inquiry components. The researchers' conclusion that very few of the 57 studies integrated the different method types at the level of data analysis led to a later paper (Caracelli & Greene 1993) that identified four major strategies for analysing, in an integrative fashion, the content of a mixed-method framework.

In the next section we discuss how Greene et al's (1989) conceptual framework and the "purposes" supported the Smart Newtown research design in the application of the multiple tools of our mixed-method research design.

4. Applying the framework

Prior to development of the research design for the pilot evaluation of the two-stage project a conscious decision was made to use a variety of methods for three clear purposes – that is, Complementarity, Development and Triangulation. It was not until inconsistencies between two different data sets from two of the methods that the purpose of Initiation became a part of the research design and prompted changes to the frequency and timing of the observation method. At the conclusion of the pilot evaluation further funding made possible an evaluation of stage two, the post-implementation phase, and it was then that the fifth design purpose of Expansion produced a more comprehensive evaluation. The application of these purposes is discussed in the following sections and on reflection, now that the project evaluation has finished, we believe that the different characteristics of each purpose contributed to a better understanding and management of the "real-world conditions" (Patton 1990 p. 42) and balancing the politics and tensions that inevitably arose in this multi-stakeholder project.

4.1 Complementarity

The longitudinal evaluation, over a four-year period, allowed the time for illustration, enhancement elaboration, and clarification of the results from one method to the other. Observation proved to be an important method and the focus was broad. We wanted to gain a holistic view of the entire project and there were many frequent, informal visits, at random times to the centres. Depending on what centre and what session was being observed the role of the researcher was as an onlooker, as an outsider (for instance during teaching sessions) or, more usually, as a part-participant (Patton 1990). For example, while observing the computing classes where the immigrant English language group were taught how to connect to the Internet for communicating with friends and family in their homeland we helped when individuals had difficulties with the technology. Observations were overt in that all participants were aware of our role in the project and that observations were being made. The benefits of the observation periods (usually 40 to 70 minutes at a time) included:

- becoming well acquainted with the coordinators and many of the volunteers at the centres as well as some of the regular centre-users
- building trust with the project stakeholders and partners that led to more relaxed interviews and conversations which elicited broader and deeper information.

During the observation sessions informal, "conversation" type interviews occurred and proved to be useful in many situations. For example, they were critical for eliciting the perceptions of participants attending the Head Start programme. These were people who had varying degrees of head injuries and as a result their concentration span was often very limited. Conversations were also useful with the project partners where perceptions and opinions (often not expressed at the formal monthly communication meetings) were expressed.

At the same time formal interviews were undertaken with users, volunteers and partners whereby questions were asked on different aspects of similar phenomena, thus drawing a richer and more in-depth picture of the situation. The formal interviews often complimented the earlier observations and conversations and also enabled us to clarify points raised by participants thus providing 'the other side of the story'.

4.2 Development

Quantitative data, in the form of a questionnaire, were collected to provide a demographic portrait of participants, to discover what aspects of computing individual users found to be relevant and useful, the frequency and level of use of the centres' facilities and whether they attended classes or were sufficiently knowledgeable to achieve their objectives independently. The questionnaire was given to users by the volunteers/tutors and was (outside of meetings with those partners involved in developing and supporting the project) the first step in the collection and analysis of data from the intended users. The data gathered from these questionnaires were instrumental in the development of the in-depth interview questions and informed the evaluators' conversations with participants. Thus, the Development design purpose was congruent with Greene et al's (1989, p. 267) recommendation for the "sequential timing of the implementation of different methods".

4.3 Triangulation

A major rationale for our use of a mixed-method design was an expectation that there would be convergence in the analysis of the results and a conscious effort was made to assess the same conceptual phenomena. For that reason both formal interviews and informal conversations were undertaken with volunteers, users, and other partners, combined with regular observations at the centres. The different methods were implemented simultaneously and independently conforming with Green et al's (1989) description of triangulation. We combined all four types of Denzin's (1978) definition; that is data, investigator, theory and methodological triangulation. Data came from a multitude of sources; quantitative and qualitative approaches and the three researchers who brought different perspectives and analytical skills in the analysis and interpretation of the data.

Most of the data collection could be classified as being "within-methods" (Denzin 1978 p. 301) triangulation. That is, many different techniques were used to gather qualitative data which enabled us to be more confident of the internal validity of the results. However, "between-methods" triangulation also occurred whereby data on the same specific questions were gathered from questionnaires and analysed together with the qualitative data generated from interviews on the same topic using an open-ended format (Tashakkori & Teddlie 1998). The various methods produced some convergent results. For instance, findings from the analysis of the interview, conversation and observational data at the centres indicated high usage of the computers and attendance at classes at the Pacific Island Community and Cultural Centre. Here all participants enjoyed learning how to use basic computing functions, the Internet and e-mail. New migrants and settlers in particular appreciated being able to access up to the minute news from their home country and in their own language.

There were also some differences discovered. At the computing centre in the Newtown Park Flats the volunteer coordinator had co-opted another volunteer to help with tutoring the introductory computing classes. These classes were conducted on behalf of a local tertiary institution that received Government funding. The tutors received a small payment for overseeing the self-paced lessons and, where necessary, assisting the learners. Formal interviews with the volunteer tutors indicated that enrolled students, and attendance at classes, were high. During the first six months of classes our observational visits confirmed reasonable attendance. However, in subsequent months classes were frequently cancelled and when they did run there were often no students and on other occasions, just one or two in attendance. Despite this, the register continued to show high enrolments. Informal conversations with the second volunteer tutor with whom one of the evaluators had established a trusting relationship, revealed a different and paradoxical story. He reported that most classes had no students attending, despite many listed on the enrolment register.

4.4 Initiation

As mentioned earlier Initiation was not a planned purpose for the evaluation of the Smart Newtown Project. However, to unravel the contradictions of our data there was a stronger emphasis on the on-going observations, achieved by increasing the frequency of our visits at the scheduled class times. In this way we were able to assess attendance rates rather than rely on reports from the volunteer tutors. Informal conversations with participants at the "drop-in" times (out of scheduled classes) were also useful in our effort to seek and understand the veracity of what was happening. The two methods of "conversations" and observation (and subsequent follow-up with the tertiary provider) clarified the paradox. There were no systems in place that provided checks and balances to ensure accurate and true enrolment status or evaluation of the course. This situation was in direct contrast to the other major centre where the coordinator ran well-attended classes based on a freeware learning programme. The classes at this centre received very positive evaluations and had a transparent enrolment system.

The combination of the different methods revealed a situation that was ethically unsound. It appeared that government-funding, based on fictitious enrolments, was supporting a community computing programme. This knowledge presented a dilemma for the researchers. We had a relationship of trust; we felt morally obligated to WREDA who had contracted the research, and also to the wider community because taxpayers' money was being mis-used. One of the researchers contacted the tertiary provider and suggested evaluations and some observation may reveal irregularities. However these suggestions were received with little interest and after taking advice no further action was taken by us apart from indicating in our final report that our data showed problems with reliable opening and very poor, to no attendance of the classes. The centre closed a few months later due to wider abuse of the facilities (Crump 2006).

The Initiation purpose provided a fuller understanding of the inconsistencies in our original data. We gained new perspectives of the enrolment paradox through the “recasting of questions or results from one method with [the] questions or results from the other method” (Greene et al. 1989, p. 259). It was not a planned “purpose”, which accords with Greene et al’s (1989) comment that “purposeful initiation” (p. 268) is rare.

The Initiation purpose, again unplanned for, was further demonstrated when we broadened our evaluation to include a second survey (Non-user) of the majority of residents who were not using their centre’s free computing facilities. This was an unplanned survey as the feasibility study had indicated high interest in the residents’ intention to use the Newtown Park Flats’ centre yet very few questionnaires were being completed by them. Data resulting from the observation and conversation interviews confirmed many were not taking advantage of the computing facilities within their complex. We therefore responded by developing, testing and administering the “non-user” questionnaire, to elicit from the residents their reasons for not using the facilities. Eighty two percent of respondents to this survey said they did not use the centre and 25 percent indicated they had a computer in their apartment. The main reason for non-use was simply because they were “not interested”. This led to a conclusion that the facility had not been “sold” to residents and that publicity programmes should be activated. It also uncovered the fact that not all people saw engagement with ICTs as a positive force that would transform the quality of their life (Crump & McIlroy 2003).

4.5 Expansion

Because the original research contract was for the 18-month pilot project we did not anticipate the scope and breadth of the research that eventuated when funding enabled evaluation of phase two. Greene et al. (1989) state that the most frequently cited reason for using a mixed-method research model for the 57 studies they reviewed was Expansion. They believe that this indicates researchers are mixing their methods in order to extend the range, depth and breadth of their findings. Their findings suggest that quantitative and qualitative methods are used to assess different components within the same study, thus leading to expansion of the project.

In their discussion of the Expansion purpose Green et al note that frequently qualitative data is used to assess outcomes whereas quantitative data is used to assess implementation. The development of the Non-user questionnaire permitted quantitative data to be used to assess both outcomes and implementation and the phenomena which was being investigated was distinct from other phenomena within the study. The Smart Newtown study incorporated the different approaches used in the qualitative and quantitative methods, particularly at both the discovery and the analysis stage and led to the Initiation purpose described above.

Greene et al (1989) note Expansion as the design option that provides the most flexibility of the five purposes and this proved so for the Smart Newtown Project. We believe the longitudinal nature of the two-stage evaluation and the continued involvement of many of the partners and stakeholders were elements which proved conducive to an Expansion purpose.

Green et al also discuss studies that originally have a quantitative design but due to insufficient or inadequate data are “expanded” to include qualitative approaches, thereby becoming a mixed-method design. This was not the case in the Smart Newtown Project as expansion began early in the Newtown Project when the low usage at the Newtown Park Flats became apparent and while the Non-user Survey was an unplanned component, the mixed-method design had been planned from the beginning for other aspects of the project, thus reflecting a “multitask” intent from the start.

5. Conclusion

The complexity of this two-stage, longitudinal evaluation project involving multiple partners and participants was a major factor in planning the use of a multi-dimensional research design. No single method was sufficient to ensure a systematic and thorough approach to both the collection and analysis of the evaluation data or that reflected the voices of the disparate group of participants.

The Visual Model for Mixed-Methods Sequential Explanatory Design Procedures is based on Creswell and Clark’s (2007) Explanatory Design-participant selection model (p. 85-86). Our study conforms with their choices for this design in that the first quantitative phase is followed by the qualitative phase, the results of which connect to the first phase and the participants were carefully selected so that the qualitative research aim could be best addressed. The scholars note that “investigators typically place greater emphasis on the quantitative methods ...” (p. 72) of these designs but for our study the multiple tools used in the qualitative

approach provided rich content that explained paradoxes and surprising results (Morse, 1991) of the quantitative data. Therefore, priority or weight was given to the qualitative data collection and analysis in the study.

The mixed method approach facilitated responsiveness to unexpected events and results within the project thus enabling evaluation of the project's social and economic objectives. We believe the strength of this evaluation design lies in its flexibility which accommodated the two main strands of the "partnership" model as applied to this project - the commercial and contractual, and the collaborative, iterative approach between the researchers and the various individuals and groups. Greene et al's (1989) five-purpose conceptual framework guided the design and implementation of the evaluation. However it was not until the dynamism and changes within the project revealed unexpected results that all five purposes became applicable to our study.

We have demonstrated from our discussion that synthesising the results of the data gathered from the different methods led to a greater understanding of the interactions and outcomes of the different computing centres. As noted by Teddlie and Tashakkori (2003, p. 35) "the ultimate advantage of using mixed methods is in the quality of inferences that are made at the end of a series of phases/strands of study". This proved so for this digital divide study.

References

- Bryman, A., & Bell, E. (2007) *Business Research Methods* (2nd ed.) Oxford University Press, Oxford.
- Caracelli, V. J., & Greene, J. C. (1993) "Data Analysis Strategies for Mixed-method Evaluation Designs", *Educational Evaluation and Policy Analysis*, Vol 15, No. 2, pp 195-207.
- Connecting Communities: A Strategy for Government Support of Community Access to Information and Communications Technology, 2002. Wellington: Victoria Link.
- Creswell, J. W. & Clark, V.L.P. (2007) *Designing and Conducting Mixed Methods Research*. Sage, Thousand Oaks, CA.
- Crump, B. J. (2006) "Institutions, Community, and People: An Evaluation of a Longitudinal Digital Divide Experience". In E.M. Trauth, D. Howcroft, T. Butler, B. Fitzgerald & J.I. DeGross (Eds), *Social Inclusion: Societal and Organizational Implications for Information Systems*, (pp.333-346) Springer, Limerick.
- Crump, B. J., & McIlroy, A. (2003) "The Digital Divide: Why the "Don't-want-tos" Won't Compute: Lessons from a New Zealand ICT Project [online], *First Monday*, Vol 8, www.firstmonday.dk/issues/issue8_12/crump/index.html
- Denzin, N. K. (1978) *The Research Act: An Introduction to Sociological Methods*. McGraw-Hill, New York.
- Denzin, N. K. (1988) "Triangulation". In J.P. Keeves (Ed.), *Educational Research, Methodology, and Measurement: An International Handbook* (pp. 51-113) Pergamon Press, Oxford.
- The Digital Strategy: Creating our Digital Future. (2005) [online], www.digitalstrategy.govt.nz
- Greene, J. C., Caracelli, V. J., & Graham, W. F. (1989) "Toward a Conceptual Framework for Mixed-method Evaluation Designs". *Educational Evaluation and Policy Analysis*, Vol 11, No. 3, pp 255-274.
- Ivankova, V., Creswell, J. W. & Stick, S. L. (2006) "Using Mixed-Methods Sequential Explanatory Design: From Theory to Practice", *Field Methods*, Vol 18, No. 1, pp 3-20.
- Morse, J. M. (1991) "Approaches to Qualitative-quantitative Methodological Triangulation". *Nursing Research*, Vol 40, pp. 120-123.
- Patton, M. Q. (1990) *Qualitative Evaluation and Research Methods* (2nd ed.), Sage, Newbury Park, CA:
- Servon, L. J. (2002) *Bridging the Digital Divide: Technology, Community, and Public Policy*. Blackwell Publishing, Malden, MA.
- Tashakkori, A., & Teddlie, C. (1998) *Mixed Methodology: Combining Qualitative and Quantitative Approaches* (Vol. 46). Sage Publications, Inc, Thousand Oaks, CA.
- Teddlie, C., & Tashakkori, A. (2003) "Major Issues and Controversies in the Use of Mixed Methods in the Social and Behavioral Sciences". In A. Tashakkori & C. Teddlie (Eds.), *Handbook of Mixed Methods in Social & Behavioral Research*. Sage Publications, Thousand Oakes.
- Trauth, E. M. (2001) *Qualitative Research in IS: Issues and Trends*, Idea Group Publishing, London.