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ABSTRACT

The Science Quality Education Project (SQEP) experimented with a model of teacher inservice training referred to as the trainer-of-trainers' model. The project was initiated to promote the use of TVOntario's science programming and television as a teaching tool in science instruction. Using this model, the training was first concentrated on a small group of carefully selected teachers. After completing their own intensive training this "model" group became trainers of their colleagues. The colleagues then trained others with the expectation that the effects of training would continue to ripple throughout the school area. The teachers used a variety of training methods, including informal sharing with colleagues, workshops, and peer coaching. The present evaluation is designed to investigate the value of using this utilization strategy for future projects. The research assessed the success of the SQEP strategy in bringing about change in teaching attitudes and practices. It also examines the factors that contribute to the model's effectiveness as well as areas for improvement. Chapters include: (1) "The Science Quality Education Project"; (2) "The Evaluation Design"; (3) "The Success of the SQEP in Affecting Change"; (4) "The Effectiveness of the Trainer-of-Trainers' Model"; (5) "Factors Affecting Implementation"; and (6) "Conclusions and Recommendations." (KR)

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Recherche et évaluation

THE SUMMATIVE EVALUATION
OF
THE SCIENCE QUALITY EDUCATION PROJECT
(SQEP)

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THE SUMMATIVE EVALUATION

OF

THE SCIENCE QUALITY EDUCATION PROJECT (SQEP)

By:

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with the assistance of
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September 1990

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Director, Evaluation and Project Research: Olga Kuplowska

TVO
TVONTARIO

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THE SUMMATIVE EVALUATION OF THE SCIENCE QUALITY EDUCATION PROJECT (SQEP)

by:

Lynette Gillis, Ph.D.
with the assistance of
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(TVOntario, Evaluation and Project Research, Report No. 9 — 1990-91, 49 pp.)

This report is a summative evaluation of the TVOntario Science Quality Education Project (SQEP). The project was initiated in January 1987 by the TVOntario Utilization Section to promote the use of science programming and television as a teaching tool in science instruction.

The study examined the success of the project in the four Ontario school boards where it was implemented: the Lincoln County Roman Catholic Separate School Board (Primary level), the Durham Board of Education (Junior level), the Timmins Board of Education (Intermediate level), and the Bruce County Board of Education (Senior level).

SQEP experimented with a model of teacher inservice training referred to as the trainer-of-trainers' model. Using this model, the training was first concentrated on a small group of carefully selected teachers in each board. After completing their own intensive training over a period of two-years, this "model" group became trainers of their colleagues. The colleagues then trained others with the expectation that the effects of training would continue to ripple throughout the school board. The teachers used a variety of training methods, including: informal sharing with colleagues, workshops, and peer coaching. It was hoped that this model of training would encourage more substantial change in teaching beliefs and practices than the "one-shot" workshops TVOntario had previously used.

The implementation of this training model was guided by the educational change theory of Michael Fullan (Dean of the Faculty of Education, University of Toronto). Fullan's (1982) theory has described the factors influencing the implementation of change in educational beliefs and practices. Key concepts from this theory were incorporated in the project planning.

The SQEP training was initially conducted with a total of 44 teachers in 36 schools in four school boards. Approximately 50 other school personnel (i.e., principals, consultants, directors) were also involved.

The present evaluation was designed to investigate the value of using this utilization strategy for future projects. The research assessed the success of the SQEP strategy in bringing about change in teaching attitudes and practices. It also examined the factors that contributed to the model's effectiveness as well as areas for improvement.

To acquire the information, telephone interviews were conducted in February and March 1990 with 37 of the 44 teachers who participated in the original SQEP training (i.e., first-wave teachers). These individuals were then asked to provide a name of one teacher with whom they had shared their training on either a formal or informal basis (i.e., a coached or second-wave teacher). Of the 24 names offered, 21 second-wave teachers agreed to be interviewed. In turn, these individuals offered a total of six names of teachers with whom they had shared (i.e., third-wave teachers). Interviews were completed with four of the six, constituting a total interview sample of 62 teachers

Additional interviews were then conducted with all the TVOntario leaders and the board leaders.

THE IMPACT OF THE SQEP

* SQEP succeeded in affecting significant and long-lasting change in the teaching practices and attitudes of the four initial groups with whom the project was conducted. Over the three-year course of the project, the first-wave of teachers continued to make effective use of television and TVOntario programming in their science instruction and to share their knowledge and skills with others.

* First-wave teachers also reported changes in other aspects of their professional development. They claimed that the training enhanced their leadership skills and self-esteem and encouraged the development of new skills in adult education and curriculum writing.

* The effects of the project also spread to involve upwards of 300 more teachers in the four participating school boards, and more than 500 others were reached through workshops. At this level, the SQEP increased teachers' awareness and use of television and TVOntario science programming.

* As a result of the teachers' improved teaching techniques, the students were described as more interested and involved in their science instruction, more critical in their television viewing habits, and more apt to retain information from interactive television viewing.

* At the school level, participants observed a greater awareness of television programming, greater use of television in classroom teaching, the expansion of videotape libraries, the acquisition of more video equipment, and in some instances, increases in audio-visual budgets.

* At the board level, the project made an impact on curriculum development — where units were developed to incorporate television in teaching units or outlines were prepared of curriculum-related television resources. Also, in many instances, the project produced a group of media resource people who could be called upon for a variety of other tasks.

FACTORS CONTRIBUTING TO THE EFFECTIVENESS OF THE SQEP

TRAINING:

* Release-time for training first-wave teachers.

* The use of small working groups of approximately 8 to 10 individuals.

* A long-time frame for the project, though there was some suggestion that two years rather than three might have been adequate.

* The encouragement and opportunity for teachers to practice and experiment in their own classrooms.

* A strong project leader who was willing to share project planning with the group.

* The cooperation and approval of the principals in the participating schools.

AREAS FOR IMPROVEMENT

The major short-coming of the Science Quality Education Project was that it did not generate, as hoped, a continuous ripple of effects, where one wave of trainees became the trainers of the next wave. Although there was a spread of effects, it typically originated with the model teacher and spread only to a small cluster of colleagues in the same school. With each successive wave, the quality of impact diminished as well. Although second-wave teachers claimed to be more aware of television resources and to use them more frequently, they did not display the enthusiasm or the depth of commitment so evident among first-wave teachers.

In view of this, the report suggested two possible courses of action — both of which focus on improving the "networking" aspect of this model. One alternative is to consider variations that change the structure or organization of the networking phase. For example, rather than a "ripple" model, project leaders may wish to train group(s) of resource people who assist colleagues, without the expectation that these colleagues will then "train" others.

The second alternative is retain the ripple network plan as used in the SQEP but take steps to ensure that the ripple is maintained and that the quality of the training experience does not diminish significantly from one wave to the next. To this end, the study concluded with following recommendations:

1. A general network plan should be developed, outlining the project's goals in terms of the number of participants or schools targeted and the quality or level of impact desired.

2. Teachers should be recruited who are interested and available to train others, once they themselves have been trained. Teachers should join with the understanding that they will be required to train others.

3. Consideration should be given to a range of training or "sharing" methods — not just the extremes of peer coaching and workshops.

4. If peer coaching is encouraged, leaders should be advised that large numbers of teachers are not likely to embrace this method of sharing unless given considerable support, such as: release-time for coaching, greater flexibility in their teaching schedules, or some compensation in their normal workloads.

5. The SQEP training in par[illegible] needs to be demonstrated before teachers recognize its potential value — or in the words of the participants, it needs to be "pushed." It may be worthwhile to initiate the training with demonstrations designed for this purpose.

6. A teacher training resource package, including a videotape demonstrating effective utilization techniques, would be useful for both coaching and workshops.

7. The training ripples require another level of planning or organization to stimulate their expansion to other schools in the board. The network plan should include strategies for promoting and coordinating this level of activity.

8. The overall planning of the project should also include activities that would facilitate the transfer of ownership from TVOntario to the participating school boards.

9. It is important that school boards have adequate video equipment and resources to support the level of activity generated by the project, taking into consideration the increasing demand for equipment as the project grows.

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ÉVALUATION SOMMATIVE DU PROJET SCIENCE QUALITY EDUCATION PROJECT (SQEP)

par

Lynette Gillis, Ph.D.

en collaboration avec
Louise Glegg, June Larkin et Moji Ojo

(TVOntario, Service de recherche et d'évaluation, rapport n° 9 — 1990-91, 49 p.)

Ce rapport est une évaluation sommative du projet Science Quality Education Project (SQEP) de TVOntario (projet d'éducation scientifique de qualité). Le projet a été mis sur pied en janvier 1987 par le Service de l'utilisation de TVOntario pour promouvoir l'utilisation de la programmation scientifique de la télévision comme outil d'enseignement des sciences.

L'étude a examiné le succès du projet dans les quatre conseils scolaires de l'Ontario où il a été mis en place : le Conseil des écoles catholiques séparées du comté de Lincoln (cycle primaire), le Conseil de l'éducation du comté de Durham (cycle moyen), le Conseil de l'éducation de Timmins (cycle intermédiaire) et le Conseil de l'éducation du comté de Bruce (cycle supérieur).

Le projet a exploré le concept du modèle de formation interne des enseignants, qu'on a appelé le modèle du formateur des formateurs. À l'aide de ce modèle, on s'est d'abord concentré sur la formation

- d'un petit groupe d'enseignants choisis dans chaque conseil scolaire.
- Après avoir reçu une formation intensive, échelonnée sur deux ans, ces enseignants « modèles » sont devenus les formateurs de leurs collègues. Ensuite, leurs collègues ont formé eux-mêmes d'autres enseignants en espérant que les effets de la formation continueraient à se faire sentir dans tout le conseil scolaire. Les enseignants ont utilisé une gamme variée de méthodes de formation, dont le partage informel avec leurs collègues, des ateliers et l'enseignement mutuel (peer coaching). On espérait que ce modèle de formation entraînerait
- un changement plus important dans les théories et les pratiques d'enseignement que les ateliers intensifs dont se servait auparavant TVOntario.

Pour la mise en oeuvre de ce modèle de formation, on s'est basé sur la théorie de Michael Fullan, doyen de la faculté de l'Éducation de l'Université de Toronto, sur le changement en éducation. La théorie de Fullan, qui date de 1982, décrivait les facteurs qui ont une incidence sur l'introduction du changement dans les théories et les pratiques en éducation. On a intégré les principaux concepts de cette théorie à la planification du projet.

On a d'abord formé, dans le cadre du projet SQEP, 44 enseignants dans 36 écoles de quatre conseils scolaires. Une cinquantaine d'autres membres du personnel (p.ex. des directeurs d'école, des experts-conseils, des directeurs) ont également été impliqués.

Cette évaluation visait à étudier la valeur de cette stratégie d'utilisation pour les projets futurs. La recherche a évalué le succès de la stratégie du projet SQEP à apporter des changements aux théories et aux pratiques d'enseignement. Elle a également examiné les facteurs qui ont contribué à l'efficacité du modèle ainsi que les secteurs en besoin d'amélioration.

Pour obtenir ces renseignements, on a effectué une enquête par téléphone en février et en mars 1990 auprès de 37 des 44 enseignants ayant suivi la formation initiale offerte dans le cadre du projet SQEP (c'est-à-dire les enseignants de la première vague). On a demandé à ces enseignants de donner le nom d'un enseignant avec qui ils avaient partagé leur formation de façon formelle ou informelle (c.-à-d. un enseignant avec lequel un enseignement mutuel a eu lieu, ou enseignant de la deuxième vague). Sur les 24 noms donnés, 21 enseignants de la deuxième vague ont accepté d'être interviewés ; à leur tour, ces enseignants ont donné en tout six noms d'enseignants avec lesquels ils ont partagé leur formation (c.-à-d. les enseignants de la troisième vague). On a finalement interviewé quatre de ces six enseignants, ce qui donne 62 enseignants interviewés en tout.

On a ensuite effectué d'autres entrevues auprès de tous les « leaders » de TVOntario et les « leaders » des conseils.

L'INCIDENCE DU PROJET SQEP

* Grâce au projet SQEP, on a réussi à apporter un changement important et de longue durée aux pratiques et aux attitudes en enseignement dans les quatre groupes initiaux qui ont participé au projet. Durant les trois années du projet, les enseignants de la première vague ont continué à utiliser la télévision et la programmation de TVOntario de façon efficace pour l'enseignement des sciences et à partager leurs connaissances et leurs compétences avec d'autres enseignants.

* Les enseignants de la première vague ont également remarqué des changements dans d'autres secteurs de leur développement professionnel. Ils ont affirmé que la formation a amélioré leur habileté à diriger, leur confiance en eux-mêmes et les a encouragés à développer de nouvelles aptitudes pour l'éducation des adultes et l'élaboration du programme d'études.

* Les effets du projet ont également touché plus de 300 enseignants dans les quatre conseils scolaires participants et plus de 500 autres par le biais des ateliers. À ce niveau, le projet SQEP a augmenté la sensibilisation des enseignants et l'utilisation de la télévision et de la programmation scientifique de TVOntario.

* Suite à l'amélioration des techniques d'enseignement des enseignants, on a jugé que les élèves étaient plus intéressés et plus impliqués dans leur formation en sciences, faisaient preuve d'un esprit plus critique à l'égard de la télévision, et étaient plus aptes à retenir l'information provenant de l'écoute interactive de la télévision.

* Au niveau des écoles, les participants ont remarqué une plus grande sensibilisation à la programmation de la télévision, une augmentation de l'utilisation de la télévision pour l'enseignement en classe, le développement des vidéothèques, l'acquisition d'une plus grande quantité d'équipement vidéo et, dans certains cas, l'augmentation du budget pour les ressources audiovisuelles.

* Au niveau des conseils scolaires, le projet a eu une incidence sur l'établissement du programme d'études ; on a créé des services pour intégrer la télévision aux services d'enseignement, ou on a préparé l'ébauche de ressources offertes par la télévision pour le programme d'études. De plus, dans plusieurs cas, le projet a donné naissance à un groupe de personnes-ressources en médias, auquel on pourrait faire appel pour certaines autres tâches.

FACTEURS CONTRIBUANT À L'EFFICACITÉ DE LA FORMATION OFFERTE DANS LE CADRE DU PROJET SQEP :

* Un congé donné pour la formation des enseignants de la première vague.

* L'utilisation de petits groupes de travail de 8 à 10 personnes.

* La longue durée du projet, bien qu'on ait suggéré que deux ans plutôt que trois auraient suffi.

* L'encouragement et l'occasion pour les enseignants de s'exercer et d'expérimenter dans leurs propres classes.

* Un chef de projet compétent qui acceptait volontiers de planifier le projet en collaboration avec le groupe.

* La coopération et l'approbation des directeurs des écoles participantes.

SECTEURS EN BESOIN D'AMÉLIORATION

Le principal défaut du projet Science Quality Education Project est qu'il n'a pas donné naissance, comme on l'aurait espéré, à une cascade continue de résultats, où une vague d'enseignants formés devenaient les formateurs de la prochaine vague. Bien que certains résultats se soient répandus, ils se sont généralement transmis de l'enseignant-modèle à une poignée de collègues de la même école. À chaque vague suivante, la qualité de l'impact diminuait. Bien que les enseignants de la deuxième vague aient affirmé être plus conscients des ressources qu'offre la télévision et les utiliser plus souvent, ils ne manifestaient pas l'enthousiasme ou la profondeur d'engagement qui étaient si évidents chez les enseignants de la première vague.

Par conséquent, le rapport a suggéré deux mesures possibles, portant chacune sur l'amélioration de l'aspect « réseau » de ce modèle. L'une des options serait d'envisager des variations qui changeraient la structure ou l'organisation de la phase « réseau » ; par exemple, plutôt que de fonctionner avec le modèle de la cascade, les chefs de projet pourraient former un ou plusieurs groupes de personnes-ressources qui aideraient leurs collègues, sans qu'on attende de ces collègues qu'ils en forment d'autres.

L'autre option consisterait à conserver le plan du réseau en cascade utilisé dans le projet SQEP, tout en prenant des mesures pour garantir que la cascade se poursuive et que la qualité de l'expérience de la formation ne diminue pas radicalement d'une vague à l'autre. Dans ce but, l'étude formule les recommandations suivantes :

1. On devrait créer un plan général du réseau, donnant les grandes lignes des buts du projet en termes du nombre de participants ou d'écoles visés et de la qualité ou du degré d'impact recherché.

2. On devrait recruter les enseignants qui sont intéressés et qui sont prêts à former d'autres enseignants une fois leur propre formation terminée. Les enseignants recrutés savent qu'ils devront former d'autres personnes.

3. On devrait prendre en considération une gamme de méthodes de formation ou de « partage », et non pas seulement les méthodes extrêmes de l'enseignement mutuel ou des ateliers.

4. Si on encourage l'enseignement mutuel (peer coaching), on devrait rappeler aux « leaders » que bien des enseignants n'adopteront cette méthode d'apprentissage que si on leur offre un appui considérable, comme un congé pour l'enseignement mutuel (peer coaching), une plus grande souplesse dans leurs horaires d'enseignement ou une compensation quelconque dans leur charge de travail normale.

5. On doit particulièrement faire les preuves de la formation offerte dans le cadre du projet SQEP pour que les enseignants reconnaissent sa valeur possible ; selon le terme des participants, elle doit être « vendue ». Il peut être utile de commencer la formation avec des démonstrations conçues à cet effet.

6. Une trousse de formation pour les enseignants, comprenant une vidéocassette illustrant de façon efficace les techniques d'utilisation, serait pratique à la fois pour l'enseignement mutuel (coaching) et pour les ateliers.

7. L'effet de cascade de la formation requiert un autre niveau de planification ou d'organisation pour promouvoir sa distribution aux autres écoles du conseil. Le plan du réseau devrait comprendre des stratégies pour promouvoir et coordonner ce niveau d'activité.

8. La planification d'ensemble du projet devrait également comprendre des activités qui faciliteraient le transfert de sa propriété de TVOntario aux conseils scolaires participants.

9. Il est important que les conseils scolaires disposent de l'équipement vidéo et des ressources nécessaires pour appuyer le degré d'activités découlant du projet, en tenant compte de la demande croissante d'équipement à mesure que le projet prend de l'ampleur.

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OVERVIEW

This report presents the results of the summative evaluation of the TVOntario Science Quality Education Project (SQEP). The project was initiated in January 1987 by the Utilization Section to promote the use of TVOntario's science programming and television as a teaching tool in science instruction. The study examines the success of the project in four Ontario school boards and is organized as follows:

Chapter One:	The first chapter of this report describes all aspects of the Science Quality Education Project.
Chapter Two:	The second chapter describes the goals and methods of the evaluation.
Chapter Three:	The third chapter examines the success of the project in affecting educational change.
Chapter Four:	The fourth chapter reports participants' perceptions of the strengths and weaknesses of the training model.
Chapter Five:	The fifth chapter looks at the factors affecting teachers' efforts to change their teaching practices and those of their colleagues.
Chapter Six:	The final chapter presents the conclusions of the study and recommendations for future projects.

CHAPTER ONE

THE SCIENCE QUALITY EDUCATION PROJECT

1.0 BACKGROUND

The Science Quality Education Project (SQEP) was initiated in January 1987 by TVOntario's Utilization Section as one of several initiatives with the collective aim of enhancing science education and literacy in Ontario through the effective use of TVOntario's science programming.

The project came into being after the government of Ontario, in 1986, identified science education as a provincial priority for the transformation of Ontario into an advanced industrial society. To this end, funds were allocated to the Ministry of Education for a special program of renewal for science education in the Primary and Junior Divisions and to TVOntario for the production of programming related to the science curriculum. The initiative was augmented by a special grant from the Ministry of Citizenship and Culture. Since TVOntario already had a broad selection of science programming and the production of other curriculum-related series was underway, it was decided that the resources would be used to help Ontario teachers use the existing programs more effectively and creatively. With this intent, the Utilization Section launched the Science Quality Education Project along with several other related initiatives.

1.1 PROJECT DESCRIPTION

The goal of the Science Quality Education Project was to train teachers to make more effective use of television as a teaching tool and encourage greater use of TVOntario's science programming.

The project had two significant aspects. First, the SQEP experimented with a model of teacher in service training referred to as the trainer-of-trainers' model. It was hoped that this method of training would encourage more substantial change in teaching beliefs and practices than the "one-shot" workshops TVOntario had used in the past.

Secondly, the project was significant in that its implementation was guided by the educational change theory of Michael Fullan (Dean of the Faculty of Education, University of Toronto). Fullan's (1982) theory has described the factors influencing the implementation of change in educational beliefs and practices. Key concepts from this theory were incorporated in the project planning.

The Science Quality Education Project was implemented at four curriculum levels (Primary, Junior, Intermediate, and Senior), each in a different board of education. The four school boards included: the Lincoln County Roman Catholic Separate School Board (Primary level), the Durham Board of Education (Junior level), the Timmins Board of Education (Intermediate level), and the Bruce County Board of Education (Senior level).

The SQEP was administered by four TVOntario project leaders, and each project leader was responsible for a school board. The TVOntario project leaders were each paired with the leader of a board and together the two planned and conducted the training for that board. Since each board administered its own training, the SQEP was frequently described as four separate projects (i.e., a Primary project, a Junior project, etc...).

During the first phase of the project, roughly spanning the time period from January 1987 to June 1988, the TVOntario project leaders worked closely with the boards to organize and begin the training sessions. In the second year, from September 1988 to June 1989, teachers practised their training and initiated others. Both phases of the project have been documented by TVOntario's Evaluation and Project Research Branch (see Glegg,1988,1989).

Beginning in September 1989, the SQEP entered its third year. As planned, the boards assumed full ownership for their projects, while TVOntario limited its involvement to a consultative role. It was hoped that during this third year, teachers would continue to apply their training to their own teaching and at the same time, continue to affect change in others.

1.2 THE TRAINER-OF-TRAINERS' MODEL

The trainer-of-trainers' model of in service teaching is a relatively new model for TVOntario, though it has been used elsewhere. TVOntario's first experience with this model was in the "Renfrew Quality Education Project" (Sharon, 1987).

In this model, the training is first concentrated on a small group of carefully selected teachers. After this "model" group is trained, they then become trainers for their colleagues. The colleagues then train others, such that the effects of training continue to ripple throughout the school board.

In the past, projects using this model have employed a variety of methods to extend the training beyond the original group. The "Renfrew Quality Education Project," for example, used what was called the "collegial approach," where the first group of trained teachers modelled their newly acquired skills for colleagues. The teachers in the SQEP used a variety of methods including: informal sharing with colleagues, workshops, and peer coaching as described by Joyce and Showers (1980).

To apply this model of training in the SQEP, a small group of teachers was selected in each of the four school boards. Within each of the boards, this small group — who were sometimes referred to as the model teachers — met on a regular basis during the first eighteen months of the project. These meetings typically occurred once every month or every two months.

The content of the training sessions varied somewhat from board to board but generally addressed many of the same topics. Teachers were taught the proper use of equipment and shown techniques for using videotape television more effectively in their teaching. These included: showing segments of programs, starting and stopping the tape for discussion, pausing, replaying, or turning the sound off to encourage more independent thinking. The aim of the techniques is to enhance students' interaction and involvement with the videotape presentation and thereby improve learning. The participants were also instructed on the importance of fostering in their students critical television viewing skills and a better appreciation of television's unique communication capabilities.

Another purpose of training was to familiarize teachers with TVOntario's science programming and show them ways in which the programs could be related to the curriculum and integrated with follow-up activities. In some sessions, teachers were encouraged to develop lesson plans incorporating videotape television with other curriculum-related activities in an integrated unit of study.

Teachers were also taught some of the basic principles of adult education, particularly with regard to giving workshops or making presentations. Some of the groups also experimented with "Innovation Profiles" — a self-evaluation scheme developed by Ken Leithwood at the Ontario Institute for Studies in Education. Using this scheme, the groups created a profile of the skills of a successful television-using teacher; the skills were then organized along a continuum of increasing proficiency. The continuum provided a benchmark against which teachers could evaluate their progress in using television more effectively.

The training in the Primary- and Junior-level projects differed in that greater emphasis was placed on using television in conjunction with a child-centred, activity-based approach to science instruction. The Intermediate- and Senior-level projects experimented with computer conferencing.

1.3 CHANGE THEORY

The strategies chosen by TVOntario to implement the trainer-of-trainers' model were greatly influenced by Michael Fullan's (1982) theory of educational change. According to Fullan, projects designed to bring about significant change in teaching practices or beliefs progress through three important stages: initiation, implementation, and institutionalization. At each of the stages, Fullan identifies factors that influence the change process and ultimately determine the extent to which real change occurs.

A recent paper by Dave McKay (1990), one of the four TVOntario project leaders, described how Fullan's theory was applied in the SQEP.

Initiation

The stage of initiation refers to the period of time during which a change project is adopted by participants, and they are mobilized to begin training. According to McKay, the SQEP project focussed on four factors identified by Fullan as having an important influence on the process and outcomes of the initiation phase:

1 The SQEP was developed in response to a "high profile board need." It was predicted that the release of the new science curriculum would create a need for teacher in-service.

2. The potential participants were presented with a "clear model" for bringing about educational change — the trainer-of-trainers' model.

3. The SQEP sought a **"strong advocate"** among the senior administrators in the boards and succeeded in two instances, in directly involving board superintendents.

4. An effort was made to **"actively initiate"** the senior administrators — in other words, make them aware of the nature and goals of the project through a workshop or presentation requiring their participation.

According to McKay, the initiation stage of the SQEP had to be conducted very quickly because initially the project was only funded for a six-month period. Consequently, the initiation was not carried out to the satisfaction of the project leaders. McKay's paper discusses how this initiation phase of the SQEP might be conducted more effectively in the future.

Implementation

Implementation is the lengthy training phase of a change project where teachers are trained and begin to put the ideas into practice. In his paper, McKay discussed the SQEP in relation to what Fullan described as the most important aspects of this phase:

1. **"Orchestration"**: In the SQEP, the training was orchestrated to the extent that it included the key elements of theory, demonstration, practice, feedback, and coaching.

2. **"Shared Control"**: The TVOntario project leaders shared control of the project with board leaders.Also, an effort was made to share control with the participating teachers. According to McKay, there was "a greater degree of teacher control in the Primary- and Junior-level projects."

3. **"Pressure and Support"**: As an indication of their support, the participating school boards allowed teachers "release-time" for training. Project leaders also sought the support of school principals, who occasionally substituted for teachers in the classroom.

4. **"Technical Assistance"**: All of the participating school boards purchased videotapes for the project, and some acquired additional video-cassette recorders and monitors.

5. **"Rewards"**: McKay described the rewards of the SQEP which included: professional growth, publicity, presentations in neighboring boards, workshop specialist training, recognition in the board, and special positions within the board.

Institutionalization

In Fullan's change theory, this is the final phase during which the effects of training are either incorporated in the school routine or begin to dissipate altogether. According to Fullan, there is a greater likelihood that the desired changes will become institutionalized if:

1. The training has obvious **"links to instruction."**

2. The effects have **"spread"** beyond the original group.

3. The change is sufficiently **"embedded"** in the educational system, such that it will not be significantly diminished by competing priorities or other events.

4. There is **"continuing assistance"** from the project leaders and sponsoring boards until the project's goals are fulfilled.

For the interested reader, McKay's paper provides an analysis of the SQEP project in this final stage of institutionalization.

1.4 PARTICIPANTS

The SQEP training was initially conducted with a total of 44 teachers in 36 schools in four school boards. Approximately 50 other school personnel (i.e., principals, consultants, directors) were also involved. The following table reports the number of teachers and schools involved in each of the four projects.

Table 1. Number of teachers and schools in the SQEP

Project	Number of Teachers*	Number of Schools
Primary (Lincoln County Catholic School Board)	12 **	10
Junior (Durham Board of Education)	11	11
Intermediate (Timmins Board of Education)	9	7
Senior (Bruce County Board of Education)	12	8
TOTAL	**44**	**36**

* In the Junior and Intermediate projects, each group included one vice-principal.

** Initially, there were 12 teachers in the Primary project, but in the second year, five more teachers joined the group. The new teachers, however, did not receive the television utilization training.

In each of the projects, excepting the Primary, there were one or two teachers who taught at a level different from the designated level of the group. For example, in the Senior project, two teachers taught classes at the Intermediate level. All the teachers in the Intermediate and Senior projects taught science courses.

The criteria for selection of teachers varied from board to board. In the Primary project, the board leader selected teachers who were known for providing "integrated, activity-based teaching." Also, an effort was made in this board to include teachers from all Primary grades — from special education, and from both urban and rural schools. In the Junior project the board leader recruited teachers who were "eager and well respected by their peers." The Intermediate project was comprised of teachers who had worked on the Intermediate curriculum committee. The Senior teachers were recruited from each of the board's high schools, and from two of the senior elementary schools.

CHAPTER TWO

THE EVALUATION DESIGN

2.0 PURPOSE

As described in the first chapter of this report, the basic purpose of the Science Quality Education Project was to test a new utilization strategy for encouraging the effective use of television and TVOntario's science programming. The strategy involved using the trainer-of-trainers' model, supported by concepts derived from Fullan's theory of implementing educational change.

The present evaluation was designed to investigate the value of using this strategy for future utilization projects. To this end, the study examined three general questions:

1. To what extent has the SQEP strategy succeeded in bringing about changes in teaching attitudes and practices in the four participating school boards? Have these changes endured over the three-year course of the project?

1. To what extent has the SQEP strategy succeeded in bringing about changes in teaching attitudes and practices in the four participating school boards? Have these changes endured over the three-year course of the project?

2. What are the strengths of the trainer-of-trainers' model as perceived by the participants, and how could the model be improved?

3. What factors facilitated or hindered the teachers' efforts to change their own teaching practices and those of their colleagues in relation to their use of television in science instruction?

2.1 METHOD

The evaluation was based on information acquired from:

1. teachers who participated in the original SQEP training (i.e., the model teachers or first wave)

2. teachers the model teachers had coached (i.e., coached-teachers or second wave)

3. teachers coached by the coached-teachers (i.e., coached-coached teachers or third wave)

4. TVOntario project leaders

5. board project leaders

All of the teachers (model and coached) were interviewed by telephone. The interview form that was used consisted of all open-ended questions. The majority of the interviews were conducted in February and March of 1990.

The TVOntario leaders and the board leaders were also interviewed to acquire background information on the project. The board leaders in the Primary, Intermediate, and Senior projects were interviewed by telephone; whereas the TVOntario project leaders and the Junior board leader were interviewed in person.

To supplement the interview data, a discussion was held with the TVOntario leaders in June 1990, to review the preliminary findings and solicit their comments.

2.2 SAMPLE

An effort was made to contact all model teachers who had participated in the initial SQEP training groups (i.e. the first wave). Those who were interviewed were then asked to provide a name, if possible, of one teacher with whom they had shared their training on either a formal or informal basis (i.e., a coached or second-wave teacher).

When the coached-teachers were interviewed, they too were asked to provide a name of an individual with whom they had shared (i.e., a coached-coached or third-wave teacher).

A total of 62 teachers were interviewed. Of the 44 model teachers who had participated in the initial SQEP training, 41 were contacted, and 37 consented to be interviewed (84%). Three of the four teachers who declined to be interviewed were in the Primary project.

The model teachers offered the names of 24 individuals with whom they had shared. Of these, 21 agreed to be interviewed. Approximately one-third of the model teachers were reluctant to recommend a colleague for interview.

The coached-teachers identified six teachers with whom they had shared; four of these were interviewed.

Table 2 below reports the number of model teachers, coached-teachers and coached-coached teachers who were interviewed in each of the four school boards.

Table 2. The interview sample

	Model	Coached	Coached-Coached	Total
Primary	8	6	-	14
Junior	9	5	1	15
Intermediate	8	6	-	14
Senior	12	4	3	19
Total	37	21	4	62

The majority of coached-teachers were at the same curriculum level and in the same school as their coaches. At the Intermediate and Senior level, several of the coached-teachers were from disciplines other than science, such as English, history, or art.

CHAPTER THREE

THE SUCCESS OF THE SQEP IN AFFECTING CHANGE

3.0 INTRODUCTION

After three years of implementation, the educational change achieved through the Science Quality Education Project is now approaching what Fullan refers to as the stage of continuation. This is a critical stage where the effects of training show signs of permanency or begin to dissipate altogether.

The present chapter examines the success of the SQEP as it approaches this final stage of continuation. To evaluate its impact, the discussion describes the effects of the training on the participants' teaching habits, attitudes, television use, and professional development. The discussion also examines the extent to which the training has "spread" throughout the school boards and more critically, the degree to which its effects have endured.

In the sections that follow, the opinions of the model teachers are discussed first followed by the opinions of the teachers they coached. The opinions of the coached-teachers and the teachers with whom they shared (coached-coached) were reported together, unless they were substantially different.

3.1 THE IMPACT ON TEACHING METHODS

Model Teachers

As intended, the SQEP training had a strong impact on the teaching methods and approaches of the project's participants. All but two model teachers maintained that as a result of their training, they now use television more effectively in their science instruction.

In the Primary/Junior projects, the most significant change appeared to be a move away from using television with the entire class toward using it with small groups in activity centres or science centres. Rather than showing entire programs, teachers reported that they were now using selected segments with an "integrated and hands-on" approach to science.

The SQEP training appeared to have a somewhat different impact at the Intermediate and Senior levels. Whereas Primary/Junior teachers were more apt to describe how they had integrated television and science instruction, teachers in the Intermediate and Senior projects described the "television utilization techniques" they had adopted. They claimed to be using the following techniques more frequently: selecting segments of programs, starting and stopping the tape for discussion, leaving the lights on, turning the sound off, using the pause and remote control, using viewing worksheets, and previewing programs. The technique of using select segments of programs was perceived as being especially useful:

> "The training certainly changed my teaching. When I first started using film, we watched from point A to B. I had my eyes opened when I was shown the technique of using small specific segments. I like that and have used it a lot. It created time: a whole program could be 20 minutes but using part of the program would take five minutes, and then I could go on to something else. That's where I found my methods and approaches changing."

> "I now select small components of programs, five-minute chunks. I would have never thought that would be worthwhile for just five minutes."

The following comments, offered by Intermediate/Senior teachers, further exemplify the ways in which the SQEP training changed teaching methods:

> "I am working hard to integrate programs into the curriculum. I've explored a variety of teaching methods. Recently, I got several copies of a program and loaned them out to students for an assignment they could do at home or school. I have used programs with sound turned off, or like an overhead, and I stop the tape at certain points for discussion."

> "The training affected my teaching methods in quantum leaps. You'd think after 23 years, you would know all the techniques. I realized there were many ways to use video resources, many pedagogical techniques such as: using short clips, turning off the sound, using the freeze frame for lab activities, taking data from the video, or doing calculations."

> "I used to run the tapes straight through; now I stop and ask questions. It keeps them on their toes. I use more review sheets and stop the video to get the answers. Sometimes I use television as an introduction, but usually as a back-up after I have taught the lesson. Now when I do my lesson planning, I automatically check to see if there's a TVO program to back it up."

Coached-Teachers

The SQEP training had a less obvious impact on the teaching methods of the Primary- and Junior-level coached-teachers. They were generally unable to describe how the coaching had altered their teaching methods, though some did claim that it had raised their awareness of available science programming. Some also mentioned using the experiments shown in TVOntario's programs with their students or "hands-on" follow-up activities.

In contrast, the coached-teachers in the Intermediate project reported that their coaching had affected their teaching methods, and that they were now using television "more effectively." Almost all of the teachers mentioned using the technique of showing only segments of programs.

Teachers in the Senior project also reported an impact; they claimed that the coaching had affected the way in which they integrated television in their lessons. One coached-teacher for example, reported:

> "I integrate television into the lesson, support it with other activities...it is not central to the lesson, but it changes the way I present information."

Like the coached-teachers in the Intermediate project, the teachers in the Senior project described using the technique of showing only segments of programs. However, neither of the two coached-teacher groups reported using the broad range of utilization techniques described by the model teachers.

3.2 THE IMPACT ON ATTITUDES

Model Teachers:

The SQEP changed the model teachers' attitudes toward using television as well their teaching methods. Approximately three-quarters of all participants cited ways in which the training had altered their attitudes.

In the Primary/Junior projects, the training appeared to affect teachers' attitudes in two important ways: (1) it enhanced their awareness of available programs and how they might be used, and (2) it helped them feel more comfortable or confident with using television in their teaching. One teacher made the interesting observation that she could now "justify" the use of television to parents who questioned its appropriateness to classroom instruction.

The most significant impact in the Intermediate and Senior projects related to teachers' attitudes toward the "value" of using television in science instruction:

> "Yes, the training affected my attitudes toward television. I've come to see it more as a teaching tool than just a "fill-in." Before, television was more of a treat for me and the kids. Now when my students see the television set in the classroom, they don't say: 'Oh good, no science!' They realize it's a part of the program."

Similarly, the teachers who described themselves as formerly "hesitant" about using television became convinced of its value as a result of their training — and more open to innovation in general:

> "I was your traditional science teacher. I still have some of that, but now I embrace new techniques. For example, I attached a microscope to the television so I could show the kids a slide, and then I taped it. It made me more aware of other techniques, more innovative with television. I try more things, but you have to be in an environment where you're encouraged to experiment and be prepared to fail."

Approximately one-quarter of the teachers, at all levels, claimed that they had always had an interest in using television in their teaching. The project — rather than changing attitudes toward television — reinforced the attitudes they already held and more importantly, it also afforded them the time and resources to pursue this interest.

Coached-Teachers

The majority of coached-teachers in the Primary, Junior, and Intermediate projects reported that, as a result of the coaching, they now held more favorable attitudes towards using television and TVOntario's programming. The remainder claimed that they were already predisposed to using television — the coaching had simply reinforced their interest. Unlike the model teachers, however, the coached-teachers were less apt to describe these attitudes and elaborate their responses. One Intermediate teacher did remark, however, that:

> "The coaching changed by feelings about TVOntario. I realized that it was the way of using it, not just the programming that was important."

The coached teachers in the Senior project did not report any significant change in attitudes.

3.3 FREQUENCY OF TELEVISION USE

Model Teachers

The SQEP training greatly increased the frequency with which model teachers used television in their science teaching. Teachers at all four curriculum levels reported that, since the project began, they have used television more often.

Teachers in the Primary/Junior projects claimed to be using television between two and three times a month; whereas before joining the project, they claimed to use it occasionally or not at all. Similarly, teachers in the Intermediate/Senior projects reported using television three to four times a month; again a substantial increase over previous use.

The teachers appear to have maintained this high level of television use over the three-year course of the project. Most claimed that they had used television as frequently in their second year of the project as in the first year.

They attributed this increase in use to a number of factors: a greater awareness of available programs, a greater familiarity with the content of programs, increased availability of programs, and more opportunity to preview. Several mentioned that they used television more after becoming aware of effective viewing techniques. As one mentioned:

> "The viewing techniques TVOntario taught us really work. Once you use them, you want to use television more."

Most of the television programs the teachers used were TVOntario programs. The series used most frequently at the Primary level were "Harriet's Magic Hats" and "Take a Look," and at the Junior level: "Take a Look," "Habitat," and "The Science Alliance." Overall, the teachers were mostly satisfied with the quality of TVOntario's programming. While the Primary teachers tended to use only TVOntario's programming; whereas the Junior teachers made occasional use of "Owl TV" or National Film Board programs.

The most frequently used series at the Intermediate level included "Eureka," "Not Another Science Show," and "What About." The Senior teachers used these series in addition to series from "Concepts in Science." Like the elementary teachers, the Intermediate/Senior groups were very satisfied with most of TVOntario's science programming. In addition to these, they used: "Mechanical Universe," National Geographic and National Film Board programs, and local school board films.

Of particular interest was the finding that several teachers, who began using television only in science, had begun to use it in other subject areas as well. They claimed to be so "involved" or "taken with the technology" that they carried its use into areas such as language arts, English, or novels.

Coached-Teachers

The increase in the use of television and TVOntario's programming was also evident among coached-teachers, though not to the same degree as the model teachers. A few mentioned that the sharing had not increased their use of television but had increased their awareness of TVOntario's programming. Although the coached-teachers used many of the same series as the model teachers, those who taught in other disciplines mentioned a variety of other series — "The Origin" being the most frequently mentioned. Although the coached-teachers seemed less familiar at times with actual series' titles, they were nonetheless satisfied with the general quality of TVOntario programming.

3.4 THE IMPACT ON STUDENTS

Model Teachers

Almost all of the SQEP participants observed that their students had benefited in some way as a result of incorporating television more effectively in their science instruction.

The Primary/Junior teachers felt that their students had benefited most from watching scientific experiments on television and then having the opportunity and inspiration to try the experiments themselves. Many of the teachers observed that this combination of videotape and "hands-on" experimentation enhanced their students' involvement and interest in science and ultimately, their understanding.

Junior teachers in particular claimed that television afforded their students the opportunity to observe scientific experiments that could not be done in their classrooms. It helped students understand concepts like "vacuums" and experience events, like whale watching, that they might not otherwise see.

Both Intermediate and Senior teachers observed changes in their students' viewing habits. Several claimed that now their students were more "critical" viewers, more inclined to perceive television as a learning experience, and more motivated and enthusiastic to learn from the medium.

One Intermediate teacher claimed that television had helped her students to relate their classroom experiments to science in the real world:

> "They could see that science wasn't confined to the classroom, that other people did it in the real world. The impact was apparent in their science projects; they had much more scope."

Several teachers in the Senior project observed improvement in their students' retention and performance on assignments and tests:

> "The television programs increased their understanding of the particle theory, with which they had difficulty before. We talked about it, but with the video it was easier. The test marks improved, and their comprehension of the particle theory and the atom improved. They can't comprehend this through pictures or drawings on the board."

> "My students' reaction was very positive. At one point, I did an evaluation of the impact and felt that they had learned more using television. I gave an assignment to two classes. One saw the video, one didn't. The group which saw the video had better recall."

Coached-Teachers

Like the model teachers, almost all of the coached-teachers reported that their students had benefited as a result of their using television more effectively. Coached-teachers in the Primary project claimed that television had increased their students motivation and had given them a clearer understanding of various topics. Many of the coached-teachers in the Junior project remarked that because students were so familiar with television, they were more attentive and retained more information.

Coached-teachers in the Intermediate and Senior projects, also like the model teachers, observed improvement in their students' critical viewing skills — often in areas other than science. One claimed that poor readers had benefited most.

3.5 PROFESSIONAL DEVELOPMENT

In addition to becoming knowledgeable and experienced in the use of television, the SQEP teachers claimed, that as a result of their participation in the project, they had become more competent in other areas of their profession as well.

According to the Primary/Junior teachers, one of the most significant outcomes was that they gained expertise in writing curriculum and giving workshops. Many claimed that they discovered new capabilities in these areas — it expanded their range of professional competencies and more importantly, enhanced their self-confidence. As one Junior teacher reported:

> "I think I have grown a lot through the project. I had to be accountable. I had deadlines for workshops. I became more confident in my professional ability through public speaking and by presenting workshops to colleagues. It broadened my educational horizon."

> "It forced me, because I ended up planning curriculum, to look at the ways you plan a curriculum for a board and to present workshops to my peers and different teachers. In that sense, it made me grow professionally. I became more confident in presenting workshops and comfortable enough with the curriculum product I produced to present it to others."

Many of the Primary/Junior teachers claimed that they were now more confident teaching science. A few enrolled in additional science courses and remarked that this was something they would never have done before.

Two teachers also reported that the project had changed their teaching styles. They were now more involved in cooperative teaching and learning from peers.

The impact of the project on the professional development of the Intermediate and Senior teachers, though essentially favorable, was more difficult to discern. One of the most frequent comments was that the project had enhanced the teachers' "self-esteem." They viewed themselves as a part of a "special group." In a few instances, they discovered new interests in such areas as adult education and peer coaching. One teacher claimed the project led to a new job as "audio-visual facilitator" for his school. Another described it as "PD at its best."

A small number of teachers, mostly at the Intermediate and Senior level, claimed the project had "no effect" on their professional development. One claimed it had an adverse effect; he disliked the "politics" and what he called the "hidden agenda of becoming a staff mentor."

Coached-Teachers:

The coached-teachers in all four projects commented that the coaching had contributed to their professional development, though not to the same degree as the model teachers. They generally perceived the coaching as having enhanced their self-confidence, their awareness of programming, and their general teaching ability. Some also commented on the encouragement and support they received from the model teachers and their own eagerness to try new ideas "to break the routine." One teacher, who was promoted to an administrative position, claimed that when doing teacher evaluations, he now asks: "Have you thought of using television?"

3.6 THE IMPACT ON THE SCHOOL

Model Teachers

In addition to changing the attitudes and teaching methods of its participants, the impact of the SQEP extended beyond the teachers themselves, affecting change in colleagues and other aspects of their schools' operation.

The SQEP initiative appeared to have its greatest impact in the area of videotape use. A majority of participants in each of the projects reported that other teachers in their school had become more aware of available television programming and were now using it more often. One Senior teacher remarked that "even those unexpected have been spotted using television."

In turn, this increase in television use created a greater demand for equipment. More than one-third of the Primary/Junior schools purchased new video-cassette recorders or monitors. Similarly, all but one of the Intermediate schools purchased equipment or planned to do so, as well as more than half of the secondary schools. Some mentioned that their schools would be purchasing video-cassette recorders with the features they had learned to use in training, such as freeze-frame controls and memory buttons. In one instance, camcorders were purchased and used extensively by students and teachers alike.

Some project participants also mentioned a corresponding increase in their school's videotape libraries; others described their plans to create one. In a few instances, Intermediate and Senior teachers observed a decrease in their schools' use of films.

Participants also reported changes in budgeting. In the Primary project, changes were made in the Board budget to accommodate the purchase of science equipment and materials. In the Intermediate project the Board budget for audio-visual resources was increased, and in the Senior project, the departmental budgets were increased in at least two schools. In one Senior school, a new position was created for an audio-visual facilitator.

The SQEP also developed a group of resource people in the boards that could be called upon for advice, help, and direction. In the Senior project, this team of resource people will continue to meet once a year to offer their continued input to the Board's Media Center.

The Primary level project culminated in the production of new science curriculum units that were approved by the Board and distributed to schools. A significant feature of the units was that they integrated videotape resources with an "activity-based science program."

In similar initiatives, teachers in the Junior and Intermediate projects prepared outlines of videotape programs to correspond with their curriculum; whereas previously, these resources had not been referenced.

3.7 THE PERMANENCY OF TRAINING EFFECTS

The changes brought by about by the SQEP training — in television use, teaching methods and attitudes — have endured over the three-year duration of the project, and the participants perceive their new knowledge and skills as a permanent part of their teaching repertoire.

All but two of the model teachers reported that they have continued to make extensive use of videotape resources and to apply the skills and knowledge they have acquired. For many of the teachers, procedures such as stopping and starting the video-cassette recorder, using segments, etc., have become a matter of "habit." There was little doubt among the participants that the changes initiated by the project would be long-lasting:

> "I think there is a very good chance that these changes will endure. Videotapes are now an integral part of my course of study. It's more than just a trend."

> "It's extremely likely that the changes in teaching will endure. All the people involved in the project are committed to the use of TVOntario's programming, It will not be limited to science, but will spill over to other subject areas as well."

"I think the changes will endure over time because we value them. I think we learned a lot about TVOntario materials and how to use them. Those are things that you're going to keep with you no matter what."

Coached-Teachers

The coached-teachers were not involved with the SQEP for the same period of time as the model teachers; consequently, they had difficulty commenting on the permanency of effects. They typically commented on the permanency of changes they had observed in their schools, rather than changes in their own teaching. Most predicted that the changes they observed would endure over time. As evidence of this, they pointed to the inclusion of television references in the curriculum documents and the expansion of their school video libraries.

"The video library is expanding... everyone in our school is now moving to video."

A few teachers, however, predicted that the effects of training would be longer-lasting with model teachers than with those who had been coached.

3.8 THE TRAINING RIPPLE

Model Teachers

In each of the four projects, approximately 80% of the teachers reported that they had shared their training with colleagues during this school year and planned to continue doing so in the future. Many who had not shared had changed positions, courses, or schools.

Over the three-year course of the project, almost all of the model teachers reported that they had shared their training with teachers in their own school. The number of in-school colleagues with whom they shared varied from one to 25, with a mean of approximately six. This sharing or coaching was typically conducted on a very informal basis: the model teachers discussed their training with colleagues, they helped colleagues find relevant programming, or offered suggestions for it. Some taught their colleagues effective videotape utilization techniques. Most model teachers made a presentation to their staff.

Approximately one-quarter of the model teachers also reported that they had shared their training with teachers in other schools in their boards. Of these, half had helped another teacher to incorporate television into a lesson or unit of study, and half had given a workshop to demonstrate programs and utilization techniques.

Another one-quarter of the model teachers reported that they had made presentations on professional development days or conducted workshops with groups of educators across the province in conjunction with TVOntario.

In all the projects, except the Primary, the majority of teachers reported that they planned to continue promoting the use of television in their schools or act as a resource person to their colleagues. In the Primary project, where the funding was suspended during the past year, the teachers were more uncertain of their future activities.

Coached-Teachers

Most of the coached-teachers, in all four projects, also reported that they had shared their training with others in their schools and planned to continue doing so in the future. Much of this sharing, however, occurred with the same teachers with whom the model teachers had shared. In other words, there tended to be a cluster of the SQEP teachers in each school who were familiar with the project and who exchanged ideas and materials amongst themselves.

Although most coached-teachers did not make formal presentations outside their schools, they were involved in informal sharing and often assisted with presentations to their school staff. Beyond this, the coached-teachers shared their training through curriculum development activities and through their participation with various planning committees.

3.9 WILLINGNESS TO PARTICIPATE IN FUTURE PROJECTS

Teachers were asked, based on their experience with this project, whether they would be willing to participate in similar teaching improvement projects in the future.

Of all the model teachers interviewed, only three participants claimed that they would not participate in future training projects of this nature and four claimed it would depend upon the project. The remainder, constituting the majority of those interviewed, indicated they would be "very willing" — a strong indication that the project had either encouraged or at least sustained their interest in professional development and educational change.

This same level of enthusiasm, however, was not evident among the coached-teachers. Although all the coached-teachers in the Senior project reported that they would participate in similar teaching improvement projects ("depending on the time commitment"), less than half of the those in the Primary, Junior, and Intermediate projects indicated an interest. Those who said that they would not participate, usually cited "a lack of time" as the reason.

3.10 SUMMARY

The First Wave of Impact: The Model Teachers

The results of this evaluation clearly suggest that the Science Quality Education Project achieved the goals for which it was conceived with the teachers in the original training groups — that is, in the first wave of the training ripple.

The interviews with 44 model teachers revealed that the project had succeeded in changing their attitudes and teaching practices. As a result of their training, they claimed to use television and TVOntario's programming more effectively and more frequently in their science teaching. They had learned creative ways of integrating television in their science activities, to use television in more interactive ways, and to apply effective utilization techniques. They also claimed to be more aware of available science programming and more confident in using the technology. In turn, they described their students as more attentive and involved, more critical in their viewing habits, and more apt to retain the information presented.

At the level of the school, the SQEP promoted a greater awareness of available science programming and increased television use, even in disciplines other than science. Teachers reported that their schools had acquired more videotape equipment, expanded their videotape libraries, or increased their audio-visual budgets. Curriculum units were either created or appended to incorporate television resources.

Aside from the direct effects of training, the teachers perceived the experience as enriching and were enthusiastic in describing how they had grown in other areas of their profession as well, notably in leadership skills. Almost all of the model teachers indicated they would be "very willing" to participate in similar projects in the future — a strong indication that the project had either encouraged or at least sustained their interest in professional development and educational change.

In short, there is little doubt that the SQEP had very a favorable impact on the model teachers, an impact that extended beyond their classrooms to the level of the school. Of greater importance, however, was the finding that these changes, brought about by the SQEP, have endured over the past three years of the project. Aside from the tangible evidence of change (e.g., more equipment, larger budgets, etc.) the teachers themselves perceive their new knowledge and skills as a permanent part of their teaching repertoire.

The Second Wave of Impact: The Coached Teachers

As planned, the SQEP also created a second wave of impact. The size of the wave, or the number of individuals involved, however, was very difficult to estimate.

The impact, first of all, was largely centered in the model teachers' schools. Although some teachers shared with teachers in other schools in their board, it was not a frequent occurrence. (Approximately 25% reported sharing in other schools, and half of these involved a staff workshop).

In their schools, model teachers reported that, on the average, they had shared with approximately six or seven other teachers. Based on this, one could estimate, that in addition to the original group of 44, this second wave of impact involved as many as 300 others in the same schools.

In addition to this, an estimated number of more than 500 to 600 teachers were peripherally involved through workshops or television-related professional development days.

This provides a rough indication of the number of people involved in the second wave of impact. It does not, however, say anything about the extent of the teachers' involvement or the nature of that impact.

The study employed a very loose definition of "sharing." It included everything from having a lunch conversation with another teacher about the SQEP to the other extreme, of becoming "buddies" with another teacher to jointly develop and exchange units of study. Though it was difficult to discern what mode of sharing was most common, it did seem that much of the sharing involved: suggesting relevant programs to teachers, suggesting ways of integrating the programs, and demonstrating some of the effective videotape utilization techniques.

The interviews with the 21 coached-teachers were instructive in that they revealed more about the nature of the impact on the second-wave participants. Since coached-teachers were suggested by the model teachers, it could be assumed that they were probably teachers with whom the model teachers had shared most extensively.

The second-wave interviews revealed that the SQEP training had affected the coached-teachers in many of the same ways as the model teachers — but by no means, to the same degree. It was apparent from their comments that the overall impact of the training was appreciably weaker in this second wave.

The major impact, at this level, seemed to be an increase in awareness and use of TVOntario's science programming and a greater familiarity with some of the utilization techniques — particularly that of using program segments. In contrast to the model teachers, the coached-teachers were far less interested in participating in future teaching improvement projects.

Thus, although the SQEP had initiated a second wave of impact, involving at least six-times as many teachers, the impact at this second level was considerably weaker — with little commitment on the part of its participants to train the next wave.

The Third Wave: The Coached-Coached Teachers

Although the coached-teachers shared with others, they frequently shared within the same group as the model teachers. Few new teachers were added to constitute a significant third wave.

Of the 21 coached-teachers interviewed, only six offered names of other teachers with whom they had shared to be contacted for an interview. (Many claimed that the teacher(s) with whom they shared, had simply been "someone at a workshop.") Of the six teachers identified, only four could be reached. Thus, it was at this point, that the effects of the SQEP had clearly dissipated.

CHAPTER FOUR

THE EFFECTIVENESS OF THE TRAINER-OF-TRAINERS' MODEL

4.0 INTRODUCTION

Until recently, TVOntario typically used one-day workshops as the most common strategy for promoting the use of television and TVOntario's programming. The workshops were offered to teacher groups throughout the province and were designed to acquaint them with TVOntario materials and suggest ways of integrating the resources in their teaching.

Although the workshops have been very popular, Utilization Officers have questioned their effectiveness. Their concern is that, after only one day of training, teachers frequently lack the commitment to apply the ideas to their teaching and that too often, the effects of the training are short-lived.

Consequently, the SQEP was seen as an opportunity for TVOntario to experiment with a different model of teacher in-service. The trainer-of-trainers' model was selected in the hope that this approach would enable TVOntario to reach more teachers and bring about more substantial change in teaching practices.

The present chapter examines some of the strengths and weakness of this model as identified by the SQEP participants. As in the previous chapter, the comments of the model teachers are presented first.

4.1 THE STRENGTHS OF THE TRAINING MODEL

The model teachers in the SQEP were unanimous in the opinion that the in-service training model had been "very effective" in evoking lasting change. They attributed this success to a number of key factors — the most important being the "release-time" afforded teachers for their training and the use of small working groups.

Release-Time

Teachers in all four projects remarked that the project succeeded to the extent that it did because a significant portion of the training was conducted during school hours:

"The training gave teachers time out of the classroom to think of other professional matters. It educated us; it didn't put any extra pressure on us because we had the time off to participate. We didn't have to attend the training sessions after school hours."

"It's important that the training occurred during school hours — that we were given release time. If it had been after school or in the evening, I could not have attended."

Small Working Groups

Other model teachers, particularly in the Primary and Senior projects, claimed that the strength of the training model was that it allowed them to share ideas and experiences with one another in small working groups:

"There was a sense of intimacy. You can't create camaraderie with a large group. In small groups you can build team strength."

"The training gave us an initial opportunity to share with a small group... to become comfortable and to build confidence before we move on to larger groups."

"It worked because we had a small, manageable, and close-knit group that met regularly."

"Coming together in a collegial atmosphere...it worked because of the commitment of teachers to share and continue to come together as a group."

Classroom Experimentation

Another strength of the training model was that it encouraged teachers to experiment and try out the ideas and techniques they were learning and then to share the results of this experimentation with their colleagues.

"There was total involvement on the part of the people in the in-service. We would go back to the classroom to try things out, and then at our meetings, we would share our ideas from the classroom and talk about what worked and what didn't. That was really worthwhile."

"The training allowed all the people involved to try out new ideas. We experienced everything personally. It was a valuable project."

"The strength of the training was that it was so much hands-on. It was not just someone standing at the front lecturing — we did it. Our training really applied to the classroom; we were able to go back and try it!"

Long Time-Frame

In addition to encouraging classroom experimentation, the model teachers claimed that the long time-frame of the project gave them ample opportunity to develop and refine their skills:

"It takes a fair bit of time to make change. With a single professional development day, you get fired up, but it's difficult to follow through. Over a period of time, you have the time to make changes and make them part of your normal routine. Over a period of time, you feel a commitment to try ideas. It takes time for experience to become a part of your permanent repertoire."

"You can bring teachers together for a one-day workshop, and they may never do anything in the classroom. We had lots of time, intense days over several years. We had time to internalize the change. It wasn't temporary."

"The time off (release-time) over a period of two years gave me an opportunity to grow and enjoy it. We were given the time to think and develop."

There was a difference of opinion, however, concerning the appropriate length of training. Teachers in the Primary and Junior project were mostly satisfied with the SQEP time lines; whereas Intermediate and Senior teachers said initial training could have been conducted as effectively in one year.

Leadership

In addition to the factors already discussed, model teachers at all levels perceived the leadership exhibited by the TVOntario staff as favorably affecting the project's outcome. They complimented the TVOntario project leaders for both their inspiration and leadership and described them as "talented" and "dynamic."

Coached-Teachers

The coached-teachers, whose training experience differed considerably from the model teachers, offered a different perspective on the training model. Most of the coached-teachers in the Primary and Junior projects and all Senior teachers viewed the trainer-of-trainers' model as effective. Several qualified their responses, however, and maintained that the model's effectiveness depends upon such factors as: the principal's interest and involvement, the careful coordination of training activities, and the enthusiasm and communication skills of the model teachers.

The coached-teachers in the Intermediate project were less enthusiastic — largely because of the peer coaching and the fact that the project had focussed only on science.

From the perspective of the coached-teachers, the chief advantages of the model were: (1) the "trainers" were people they knew well, and (2) they had ready access to a resource person in their own school:

> "I think it's more effective to have teachers in our system that we know. I think sometimes, the personal contact with a person we know makes it a little bit easier."

> "You can work extensively with a few people, then multiply. It's easier to work with colleagues who are always there. It's not a one-day thing with the expert gone. There's on-going support."

> "The strength of the model is the networking aspect. It's right within the school. When I need immediate help, it's good to have someone there."

4.2 THE WEAKNESSES OF THE MODEL

The model teachers in the SQEP were unanimous in the opinion that the in service training model had been "very effective" in initiating lasting change in their own teaching habits. There was little doubt that the SQEP had succeeded in helping them to use television more effectively in their own science instruction. Their concern was — not with their own training — but with the process and mechanisms for training others.

Although the teachers in the project had shared their training with others in this past year and planned to do so in the future, they perceived this networking phase (where the trainees become trainers to others) as the major weakness of the model. They expressed a variety of concerns, all of which suggest that this phase of the model needs to be developed more fully and the means and methods more carefully weighed.

As some teachers pointed out, the training ripple — where trainees become trainers — will not occur spontaneously; it needs to be planned and supported:

> "The model is quite effective, but it might be formalized a little more. The transfer of training was left to the teachers...it was assumed it would happen by osmosis. Teachers need to know what is expected of them."

To improve the effectiveness of the networking phase of the project, the teachers raised a variety of issues the model will need to address. These are examined in the discussion that follows:

Recruiting

Several teachers suggested that, in order to plan an effective training network, participants must be recruited with this goal in mind. Hence, at least a proportion of the participants should include teachers who are particularly interested in training others, once they themselves have been trained.

This did not occur in the SQEP training because the concept of sharing and peer coaching evolved in the course of the project itself. When the concept was introduced to the participants, some felt that they had been misled or that it was not "what they had bargained for."

> "Some teachers were turned off because the demand to spread the training was not made clear at the beginning of the project, and they weren't prepared to do it except maybe in their own school. The expectation was not clearly stated."

The Form of Sharing

The SQEP participants clearly preferred some methods of sharing their training more than others. They distinguished three forms of sharing: (1) sharing informally on a one-to-one basis (or in a small group) with friends and colleagues, (2) sharing with groups of teachers in workshops or presentations, and (3) sharing on a one-to-one basis through a formal peer coaching arrangement.

Almost all of the participants expressed favorable attitudes with regard to sharing on an informal basis with colleagues. As a result of their involvement with the project, many claimed to feel more confident and comfortable with this kind of activity:

> "If I see someone in need, I would be more eager to share now. Now I know how to help them out. Even if it is a teacher in another department, I can tell them about the techniques and how to incorporate video into their lesson plans."

> "It has made me more confident that I have something worthwhile to share. I'm more willing to do it."

Not everyone, however, felt comfortable giving workshops or making formal presentations. This type of activity seemed to interest only certain individuals — those who had previous experience doing it or those who discovered through training that they enjoyed it:

> "The project has had a big impact on me. At the beginning of the project, I didn't like to share or talk in front of a group. By the end of the project, I was much more comfortable and did share."

There was very little support for the formal peer coaching arrangement. Although a few mentioned that they would like to try peer coaching, most expressed a distinct preference for more informal sharing:

> "I have no problem with sharing, but it hasn't happened in our school in a formal way. Peer coaching has not been embraced due to time and formality. I can sit with colleagues informally ...OK...but I don't have time for formal peer coaching. Their insistence on formality has caused us to shy away from peer coaching. It's good informally...but the formal coaching is not done."

> "The difficulty is not with sharing training, but formalizing these times for sharing. People don't like the title 'peer coaching'... being tied to a framework. This is a big issue: time. When do I have the time to do this? Other teachers feel they are being coerced. Teachers feel more comfortable saying: 'Let me show you, but not in a formalized arrangement.'"

> "This was an outstanding way of conducting the training, rather than a one-day professional development session where only 5% will use what you show them. Working with a group for a year, allowing them to experiment, was great. The second part, peer coaching, was not embraced formally by anyone in the group. It didn't work."

The teachers offered numerous reasons why they disliked peer coaching, the most frequently mentioned was that the arrangement was too inflexible for busy teachers and too difficult to synchronize with all their other responsibilities.

> "The problem is that we just don't have time. Peer coaching is too inflexible. We have a ten-period day and a five-day cycle with 35-minute periods. Time is the problem for formalized sharing."

Some perceived their own training and sharing informally with peers as demanding enough on its own:

> "I don't know how often I could go through a program like this and still teach school. I had to prepare for class (for a supply teacher), and I had assignments to do for my training. That wasn't explained. It was a big commitment, a lot to ask. If I had known of the amount of work involved, I don't know if I would have done it. The biggest problem is trying to fit it in with regular teaching, but I thought it was worth it."

Aside from the time involved, others mentioned that they were uncomfortable assuming the role of a peer coach, that the arrangement had "elitist overtones." They were reluctant to distinguish themselves as "experts" among their peers.

> "I'll continue to share, but only informally. I'm dealing with dicey personalities in my school. It's a problem if I say: 'Look at me, this is how it works.' It is easier if the department head does that, so it doesn't sound like: 'Look at me.'"

And finally, there were others who were simply unsure of how to spread their training effectively:

> "How do I get the knowledge across to staff? Our staff meetings already have a full agenda?"

> "We feel good now; how do we get to the rest of the teachers?"

Training Outside the School

Teachers perceived the model as successful in affecting change in their own schools, but expressed serious reservations about the effectiveness of the project in reaching other schools throughout their board.

Although most teachers were agreeable about sharing with immediate colleagues in their own schools, or even with their entire school staff, fewer were willing to go beyond this and involve teachers elsewhere.

> "An excellent model, provided everyone knows the implications in advance." It makes sense having one group train another — phenomenal model — learning from peers is very effective. It's the only way real change will occur. We need this to modify our teaching. However, when it comes to the transfer of training, there are certain people who love to move out of the school, whereas others are content to train only those in their own school."

> "The definition of 'colleagues' is where we lost it. We defined colleagues as our staff and that's fine, but their definition (project leaders) was everyone in the system."

In some instances, the distances between schools made it too difficult for colleagues from different schools to work together. Others insisted that training outside the school was simply too much to ask of full-time teachers, especially without some remuneration:

> "If a teacher is going to train teachers in other schools, then he has to spend time preparing a presentation, getting to the school, and then working with the teacher and making the presentation. You have to prepare a package that the trainee can carry the ball with. A full-time teacher jumping in the car at 3:00 in the afternoon to go out to a school... you're just not going to get a job done well.

> For this extra work of coaching (outside the school), I think some kind of remuneration is required. We still had to leave our work behind in the school. If I'm going to go out again, its got to be worth my time. I'm all for good will. I'm the first person to say a board has to function on a tremendous amount of good will, but in this situation, I feel quite justified in asking for extra remuneration."

There was also some consensus among teachers that when training moves beyond the participants' schools, then this stage of training requires more planning and coordination to be effective. Without some structure to this stage of sharing, they would not undertake to visit other schools on their own.

Some teachers suggested that, in order to facilitate this spread of training, the trainers be given release-time for making school visits or that a few teachers be seconded to full-time trainer positions. Others argued that training might spread more effectively if more groups were trained, or if new teachers from other disciplines were brought into the project.

One teacher suggested it would be useful for training new teachers to have a video demonstrating the effective use of TVOntario's programs in the classroom.

The Transfer of Ownership

Another serious problem, with which the model must come to grips, is how to ensure that the training ripple continues once the school board assumes full ownership for the project.

After TVOntario transferred ownership to the boards, only one of four (the Junior project) maintained a level of funding and support comparable to what was provided in the two previous years of the project.

Although the teachers in all boards claimed that they are continuing to share their training, only the Durham Board (the Junior project) has actively promoted and supported this kind of activity through the third year of the project. They are the only training group that has continued to meet for project-related activities.

> "The follow through came to a grinding halt. We were expected to take ownership and carry on. It didn't happen as well as it should have. Teachers were busy with other demands, or they may have found it too demanding. We didn't anticipate this."

In the Primary project, where funding was suspended during this past year, the participants viewed the project as more or less finished in the absence of board support. Although they planned to continue to apply their training to their own teaching and possibly share with immediate colleagues, they did not foresee initiating any activities beyond this. They described the project as losing the momentum it had gained in the past two years.

> "It's a good model, but the project needs continuous support in terms of time and funding. There are twelve of us in our board, and we have all benefited. However, it has been a problem spreading the news because our funding was cut-off."

Teachers in the Junior project commented on the importance of "follow-up" meetings to " re-energize people's interest." A few teachers in the Senior project commented on the need for a long-range plan: "a carefully worked out plan to carry it through from the first to final stages."

Coached-Teachers

Coached-teachers were less able to comment on the weaknesses of the training model. The weakness cited most frequently concerned the frequency or the manner with which the model teachers had shared their training. Several commented that the model teachers should have provided more workshops for their colleagues or more organized training sessions.

> "I don't know if those people who participated gave seminars to share their experience. I haven't heard of any. There was no sharing, maybe they didn't have the time or the know-how."

> "The transfer of ideas and skills from TVO personnel to the school was a problem that needs much attention."

Also, several coached-teachers expressed the opinion that the project was too limited in scope and should have addressed a broader range of subjects.

Some of the coached-teachers also questioned the need for the extensive training provided to model teachers:

> "To be frank, I don't know why it is necessary to give them (model teachers) all this training. They could probably tell them in 15 minutes, and then let them practice."

> "It seemed to us that there was a lot of duplicated training that could have been done in less time."

4.3 DISCUSSION AND CONCLUSION

The model teachers — the first wave of the SQEP participants — attributed the success of the trainer-of-trainers' model to several important elements. These included: (1) release-time for training, (2) the use of small, cohesive working groups, (3) a strong element of classroom practice and experimentation, (4) ample time for professional growth and development, and (5) strong leadership from both the board and TVOntario.

While these factors help to explain the success of the project with the first wave of teachers, at the same time, they explain why the impact was much weaker in the second wave. Unlike the model teachers, the coached-teachers did not have the full benefit of release-time for training (unless principals or other teachers agreed to cover their classes).

Furthermore, the coached-teachers did not have the support of a cohesive working group with whom they could meet on a regular basis. In the absence of such a group, there may have been less opportunity for the exchange of ideas and less identification with the project as a whole. Added to this, some of the model teachers were, by their own admission, reluctant leaders — they were either unwilling or unprepared to assume responsibility for training others.

When asked about the major weakness of the model, the teachers' comments pointed to this networking phase. Their basic criticism was that the model, as applied in the SQEP, had not carefully worked out the processes and mechanisms by which the teachers would share their training and create the ripple of effects. The teachers argued that, just as the first stage of training had been planned and orchestrated, the networking phase also required some degree of planning and support. They suggested that this planning should begin with recruiting — that teachers be selected who are specifically interested in training others.

The form that this training takes is the key issue. In the SQEP, there was a strong reaction against peer coaching. This was attributable in part to what teachers perceived as its "elitist overtones" but also to the extra time, effort, and coordination that this form of training seemed to demand. Teachers might have been more willing to enter this type of training arrangement if: (1) they had joined the project with the understanding that they would be coaching peers, (2) if they had been given release-time for coaching, or (3) if the training had been facilitated or supported in other ways.

As a result, teachers most often chose to pass along their knowledge and skills to colleagues on an informal basis — hence, the strong preference for the term "sharing" rather than "training" or "coaching." Although the informal sharing reached a considerable number of the teachers' colleagues, the nature of the impact, as the findings revealed, diminished considerably in this second wave.

This raises the question of whether or not, in the second wave of training, the impact was any greater than what might have been achieved through one-day workshops. (In fact, many of the model teachers used workshops to share their training with their staff.)

Thus, it appears that the strength of the model is the nature of the training experience provided to the first wave of teachers. The essential weakness is the failure of the model to replicate this experience to some degree for the successive waves of participants. The findings suggest that the quality of training or "sharing" diminishes in the absence of an overall plan to coordinate or organize the training ripple and without support for potentially more effective forms of training such as peer coaching. These two elements — both planning and support — are also essential for promoting the rippling to other schools in the board and for ensuring that the project maintains its momentum through the transfer the ownership.

CHAPTER FIVE

FACTORS AFFECTING IMPLEMENTATION

5.0 INTRODUCTION

This final chapter of results examines the factors that have facilitated or hindered teachers' efforts to change their own teaching practices and those of their colleagues in relation to their use of television in science instruction.

The information presented in this chapter complements the analysis presented by McKay (1990) in his project report. McKay's paper examined the factors that affected the project's progress through Fullan's stages of initiation, implementation, and institutionalization. Whereas McKay's analysis was largely concerned with project leaders' efforts to initiate and implement the SQEP as a whole, the following discussion focuses on the teachers' efforts to implement their SQEP training in their own classrooms and those of their colleagues.

To obtain this information, all the coached and model teachers were questioned with regard to a number of factors identified by Fullan as important to the implementation and continuation of educational change. The factors ranged from the perceived value of the training to the degree of support offered by the school board.

5.1 FACTORS FACILITATING IMPLEMENTATION

There was strong consensus among the teachers in each of the four projects regarding the kinds of factors that had made it easier for them to implement their training. They cited the following factors as having an important influence:

Value and Practicality of the SQEP Training

In all the projects, teachers described the skills and knowledge conveyed through their training as "very valuable" to their teaching. They were clearly convinced of the potential benefits of using television as a teaching tool in their science instruction and in other subject areas as well.

Teachers also perceived the training as "very practical" and "easy to apply" to their teaching; they had little or no difficulty putting the ideas into practice. They described their training as "down-to-earth" and "pertinent" and were generally pleased that it was not too theoretical.

Some remarked that they were pleased that their trainers were also teachers and that the training had included a lot of demonstration and opportunity for practice. A few commented that the training was practical because they were self-directed:

> "The instructors were very good. I never left confused. We directed what we did. Our project leader didn't want us to watch videos all day, but we did for awhile. We previewed and shared worksheets and then walked away with a package where we could use everything. The training was practical because we were self-directed."

> "Nothing was earth-shattering. There were things I was unaware of but could have come up with on my own. Everyone was practical. The stuff we didn't think was relevant, we didn't look at it. We were very self-directed and enjoyed having the freedom to be that way."

The Training Sessions

The model teachers were also questioned about the usefulness of the training sessions (coached-teachers did not participate in these). Overall, they claimed were generally satisfied with the sessions and perceived them as contributing favorably to the project's success. As previously mentioned, however, only teachers in the Junior project continued to meet in the third year.

Teachers especially liked having the opportunity to preview programs and to share ideas with their colleagues. In the Junior project, where the meetings have continued, the participants have found it useful to branch into areas of special interest during this third year of the project.

Again, teachers commented on the value of being self-directed. Several found the experience initially frustrating, however, as illustrated by the following comment:

> "Generally, the meetings have been very satisfying. At times, I was frustrated because of the way the project was set up — so that it wasn't prescribed for us. It became frustrating sometimes because we as a group didn't know where we were heading, and it took us awhile to kind of fit together and work together as a group. But once we did, things went really quickly... once we knew what it was we wanted to get out of this. So because of the lack of guidance, it was very frustrating, but when you look back over it... it was very satisfying." (Primary project)

There was indication, however, from teachers in all projects excepting the Primary, that there may have been more training sessions than was necessary:

> "I think the meetings could have been consolidated at times... one meeting instead of two. Sometimes we didn't accomplish much." (Junior project)

> "I was satisfied with the first four meetings, but after that it was busy time." (Intermediate project)

> "The first year was great, but then it got tedious...nothing new was achieved." (Senior project)

> "My feelings varied depending on the meeting. Some were satisfying, some frustrating. Sometimes I felt like we were going through the motions to have a meeting; we had already done some of the stuff. Also, it was difficult to visualize how some parts fit in. There were times when we spent a lot of time on the innovation profiles — we discussed it at about four meetings." (Senior project)

Apart from having too many meetings over too long a period of time, the teachers in the Senior project also claimed the objectives of their meetings could have been more clearly defined. There was some indication that too much time had been devoted to discussion of Fullan's theory, innovation profiles, and computer conferencing.

Principals' Support

The majority of teachers in all projects, model and coached-teachers alike, perceived their principals as supportive of their training activities. They based this assessment on their principals' willingness to agree to release-time (for model teachers), to announce the project to the staff, and to acquire tapes and video equipment where possible. Several of the model teachers claimed that they would have liked their principals to attend some of their training sessions. One teacher in the Senior project remarked:

"They were really wondering what we were doing; then they came to a session and found out for themselves. It made all the difference."

School Board Support

Teachers in the Primary, Intermediate, and Senior projects perceived their school boards as supportive of the SQEP. When discussing board support, however, their comments typically referred to the support provided to "model" teachers. Their comments did not address the board's support of "sharing activities."

Teachers in the Junior project claimed to be only "fairly satisfied" with the level of support provided by their board. The Junior teachers were pleased with their release-time, but disappointed with the funding and lack of equipment.

It was also evident from their comments that the model teachers attached considerable importance to visits made by senior administrators to their training sessions. They interpreted the visits as an indication of their support.

Quality of Science Programming

The perceived quality of TVOntario's programming also contributed favorably to the project's success. After previewing programs, teachers were generally eager to use them. Only teachers in the Intermediate project expressed any dissatisfaction, where one-third of the teachers claimed they were only "moderately satisfied" with available science programming.

5.2 FACTORS HINDERING IMPLEMENTATION

A Clear Need

Almost all the teachers interviewed believed their colleagues would benefit from training in how to use television more effectively in the classrooms, but added that their colleagues were probably not aware of this need:

"Teachers don't perceive a need for this. They have to be shown the benefits of training before they come to realize that they need it."

"I'm not sure that many teachers perceive a need. I don't think they feel they need any help. They are not aware that there's a better way to do it."

"Teachers are quite satisfied and don't feel the need for change."

> "If they do a job for a long time, they say they don't need it, but when they have the opportunity to see it, they are more likely to see the need."

In view of this, several teachers proceeded to explain that, in the absence of a "recognized need," the SQEP training had to be "pushed:"

> "I think it's something that has to be pushed, demonstrated, and coached. As a typical teacher you don't tend to change too much. You can send them to all the meetings and courses, but it will only work for about 5% of teachers. There has to be an on-going push, with the principal behind, pushing, and nudging."

> "I've still got a lot to learn. Through the SQEP I've been made aware of the techniques, but I'm still not using them appropriately myself. How are you going to get other teachers who haven't been through the program to do this? I think it has got to be encouraged by the people who have the power to push."

The comments of many of the coached-teachers and the teachers they coached supported this view; they claimed not to need the SQEP training — only more information about available programs:

> "The training is reasonably important, not extremely. I don't perceive a need for this kind of training ... maybe for student teachers I can see the need for it ...not for teachers who know their way around. As long as they know about the programs, they can figure the techniques out."

> "I think it's enough to just have the catalogues available."

The comments further suggested that, in the absence of a recognized need, it was more difficult to spread the training and foster the ripple of effects.

Television Resources

In all projects, excepting the Primary, at least half of the teachers reported having difficulty accessing video-cassette recorders and monitors. Teachers in portable classrooms reported problems with transporting and setting-up of equipment. Access to equipment became even more of a problem as the SQEP participants encouraged their colleagues to use television. This prompted one teacher to remark:

> "Why should we encourage others; there goes your video-cassette recorder!"

Teachers in the Intermediate and Senior projects also reported difficulty accessing videotapes. This was a more serious problem in the Senior project where teachers ordered tapes from a central media center.

5.3 SUMMARY

This chapter examined the factors that hindered or facilitated teachers' efforts to change their teaching practices and those of their colleagues. Educational change was made easier by the fact that teachers perceived the substance of their training as very valuable, practical, and easy to apply to their classroom situations. Furthermore, they typically felt that their principals approved of the project as indicated by their willingness to acquire tapes and equipment when possible. Teachers in all but one of the three projects perceived their school boards as supportive as well, with regard to the SQEP in general.

Teachers perceived two major obstacles to change. The first related to the need for this training and the second, to equipment. Although the teachers believed that their colleagues would benefit from this training, they claimed that their colleagues would have to be "shown the benefits" before realizing they needed it. They perceived the SQEP as the type of training that needs to be "pushed," making it more difficult to initiate new teachers. And finally, as mentioned, equipment problems often curtailed their activities and ironically, threatened to become more of a problem, the more successful the project became.

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

6.0 THE VALUE OF THE SQEP MODEL AS A TELEVISION UTILIZATION STRATEGY

The results of this evaluation strongly indicate that the TVOntario Science Quality Education Project succeeded in affecting significant and long-lasting change in the teaching practices and attitudes of the four initial groups with whom the project was conducted. Over the three-year course of the project, this first wave of participants (consisting of approximately 44 teachers) have continued to make effective use of television and TVOntario programming in their science instruction and to share their knowledge and skills with others.

In addition to accomplishing this major goal, the project also succeeded in affecting change in a variety of other important areas;

* The project spread to involve upwards of 300 more teachers in the four participating school boards, and more than 500 others were reached through workshops. The impact — for this second wave of participants — was an increase in both their awareness and use of television and TVOntario science programming.

* There was also evidence to suggest that the project extended to other curriculum areas such as English, language arts, and history, though the extent to which this occurred could not be accurately estimated.

* Aside from the direct effects of enhancing teachers' knowledge and skill in using television effectively,the project also appears to have encouraged, in first wave teachers: new competencies in areas such adult education and curriculum writing, the development of leadership skills, and a greater sense of professional self-esteem.

* Students were seen to benefit, as a result of their teachers' improved teaching techniques. They were described as more interested and involved in their science instruction, more critical in their television viewing habits, and more apt to retain information from interactive television viewing.

* At the school level, participants observed a greater awareness of television programming, greater use of television in classroom teaching, the expansion of videotape libraries, the acquisition of more video equipment, and in some instances, increases in audio-visual budgets.

* At the board level, the project made an impact on curriculum development — where units were developed to incorporate television in teaching units or outlines were prepared of curriculum-related television resources. Also, in many instances,the project produced a group of media resource people who could be called upon for a variety of other tasks.

Thus, the results of this evaluation support the view that intensive training provided to a small group of individuals over an extended period of time, of the kind provided in the SQEP project, is an effective means of initiating significant and long-lasting change in these participants. Such training projects can also be expected to have a broader impact as well, affecting as the SQEP did, some degree of change in the participants' colleagues and their schools.

For future planning, this evaluation is instructive in that it illustrates the potential gain in mounting a project of the size and duration of the SQEP. Project leaders will need to decide if the potential impacts, as described here, justify the time and resources such a training project necessitates.

If the project were initiated again, it would also be advisable to establish at the onset, a target outcome — that is, a percentage of teachers or schools that would constitute a "satisfactory" level of impact for a school board. This would provide, what this first trial of SQEP lacked, a benchmark against which to compare the project's progress and final success.

6.2 FACTORS CONTRIBUTING TO THE PROJECT'S SUCCESS

This evaluation has also been useful in identifying the factors that contribute to a successful in service training experience. It is therefore recommended that future training projects be designed bearing in mind these important features:

* Release-time for the training of the first wave of teachers.

* The use of small working groups of approximately 8 to 10 individuals.

* A long-time frame for the project, though there was some suggestion that two years rather than three might have been adequate.

* The encouragement and opportunity for teachers to practice and experiment in their own classrooms.

* A strong project leader, but one who is also willing to share project planning with the group.

* The cooperation and approval of the principals in the participating schools.

The teachers' implementation of the training techniques were also promoted by the fact that they perceived the training as valuable and practical and were generally impressed by the quality of the television programming.

6.2 IMPROVING THE TRAINING MODEL

The major short-coming of the Science Quality Education Project was that it did not generate, as hoped, a continuous ripple of effects, where one wave of trainees became the trainers of the next wave. The project was successful in initiating a second wave but beyond this, there was little evidence of a continuous training ripple. Typically, the effects spread from the model teacher to a small cluster of colleagues in the same school.

Of greater concern, however, was the finding that the quality of impact diminished as well. Although second-wave teachers claimed to be more aware of television resources and to use them more frequently, they did not display the enthusiasm or the depth of commitment so evident among first-wave teachers. It was questionable whether the training experience of this second group was any richer than what might have been accomplished through one-day workshops.

In view of this, it would seem advisable for Utilization leaders to examine other variations or modifications to this basic model. One alternative, for example, might be to train a number of small groups of teachers to act as resource people for other teachers in their board. In this variation of the model, the resource teachers would not be expected to train other "trainers" but would simply share their knowledge and skills with others. Although a significant departure from the present model, the relative merits of this kind of structure and others should be carefully compared and weighed.

If the trainer-of-trainers' model, as used in the SQEP, is adopted for future projects, planners will need to give careful consideration to the design and development of this networking phase. The essential challenge is to ensure that the training ripple is maintained and that the quality of the training experience does not diminish significantly from one wave to the next.

To this end, the following recommendations should be given consideration:

1. The project might benefit from the development of a general network plan. The plan would outline the goals of the project in terms of the number of participants or schools targeted and the quality or level of impact desired.

2. Teachers should be recruited who are interested and available to train others, once they themselves have been trained. This is essential for the first wave but important for successive waves as well.

3. It is important that teachers join the project with the understanding that they will be required to train others.

4. The network plan should give careful thought to the form(s) of training that will be encouraged and their potential impact. Consideration should be give to a range of training or "sharing" methods — not just the extremes of peer coaching and workshops.

5. Teachers will require encouragement and guidance in choosing the most effective means of initiating and training their colleagues.

6. Teachers perceive peer-coaching as exceptionally demanding in terms of time, effort, and organization. It seems unlikely that large numbers of teachers will embrace this method unless they are given considerable support such as: release-time for coaching, greater flexibility in their teaching schedules, or some compensation in their normal workloads.

7. The SQEP training in particular needs to be demonstrated before teachers recognize its potential value — or in the words of the participants, it needs to be "pushed." It may be worthwhile to initiate the training with demonstrations designed for this purpose.

8. A teacher resource training resource package, including a videotape demonstrating effective the utilization techniques would be useful for both coaching and workshops.

9. The training ripples require another level of planning or organization to stimulate their expansion to other schools in the board. The network plan should include strategies for promoting and coordinating this level of activity.

10. The overall planning of the project should also include activities that would facilitate the transfer of ownership from TVOntario to the participating school boards. The activities should be aimed at ensuring that the training network is supported and maintained for a specified period of time or until the project's goals are reached.

11. It is important that school boards have adequate video equipment and resources to support the level of activity generated by the project, taking into consideration the increasing demand for equipment as the project grows.

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