# DESIGN AND EVALUATION OF A MANAGEMENT SYSTEM FOR A BOARD-WIDE EXPERIMENT IN SECOND-LANGUAGE INSTRUCTION

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ABSTRACT

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Hundreds of evaluation studies of various forms are conducted each year, and the interested reader can obtain much information on design used, statistical tests applied, and educational implications of the conclusions. But little information is provided about the "management system" used to execute the study, the system's strong and weak points and its contribution to the success of the study. This thesis describes the management system used to implement a recent study in evaluation of instruction. The thesis deals with the resources that had to be coordinated; the human skills necessary to work with, to direct, and to motivate others; and particularly with the management planning and reporting requirements to keep the study on track. Finally, an evaluation of the management activity is offered. The ways in which this activity exceeded its minimal objectives and met additional criteria are discussed. An analysis of costs and benefits, suggestions for further studies, and some other observations are included.

The purpose of the experiment being managed was to ascertain the effects of supplementing the regular elementary French curriculum (in English schools) with infusion of appropriate black and white and colour TV programming in a variety of modes. These modes include off-air and video-taped showings. The study encompassed all the grade 4 classes (17) of a medium-sized board in Quebec and included urban, suburban and rural schools.

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## I. Problem Statement

Educational experiments which call for the use of many subjects and the consequent cooperation of numerous people such as administrators, teachers and audio-visual coordinators often run the risk of inconclusive results due to flaws in internal validity, despite sound research design. The faltering mechanism can often be the inability of the researchers to "manage" all of the variables adequately. This "management" problem increases in proportion to the number of resources beyond the researchers' direct control. Human resources, especially as in the case of numerous administrators, teachers and others who are part of the experiment as functionaries, are obviously the hardest to control with consistency and accuracy.

The word "management" is being used in the business sense. One broad but appropriate definition is "getting things done through people" (Guthrie, 1963). It is this aspect of an experiment conducted in the elementary schools of the Protestant Regional School Board of Chateauguay Valley (PRSBCV) that is the subject of this thesis. In other words, the study looked at the management functions necessary to execute the experiment according to plan; including management monitoring and decision making, useful quantitative methods, personnel motivation, and the handling

of classroom procedures. Researchers often lack training in these very management aspects, as curriculum evaluation courses and programs do not usually emphasize management theory and practice.

How does this thesis fit into Educational Technology? The British National Council for Educational Technology broadly defines Educational Technology as the development, application, and evaluation of systems, techniques and aids to improve the process of human learning. This thesis concentrates on evaluating the management system used to apply an experimental (developmental) technique to the learning of French, and consequently falls within the realm of Educational Technology.

Furthermore, the Council goes on to specify that Educational Technology includes work in the fields of education planning and organization, curriculum development, and information systems, to mention just those most relevant to this thesis.

This thesis consists of seven chapters, as shown in the table of contents. This section and Section II - Description of Experiment Being Managed, and III - Research Design and Critique, describe in some depth the experiment that was to be managed. A management system cannot be designed unless the characteristics and requirements of the project to be managed are reasonably well understood.

Section IV - the Management System, describes the methodology to be used to manage the project dynamically -

that is, with a good plan that allows for the early identification of potentially troublesome situations, and leads to their avoidance or correction. Section V - Implementation, described how the plan was implemented and how the reporting systems functioned, what problems arose and how they were resolved.

Section VI - Evaluation of the Management System and recommendations, first outlines the evaluative measures to be used in assessing the success of the Management System, and then compares those to the results obtained. A cost and benefit analysis is included. Finally, the author notes some additional conclusions and his impressions about the type of work this project entailed, and gives his views on the future value of this type of thesis to the academic community.

Section VII contains the report made by the author to the client of the experiment which was managed.

## II. Description of Experiment Being Managed.

### A - Socio-educational Context

Second language instruction is certainly a controversial issue in Quebec, and will continue to be for some time. The English sector has been the most aggressive of the two in attempting to improve the level of second language instruction, and striving for functionally bilingual students upon high school graduation.

The Protestant Regional School Board of Chateauguay Valley (PRSBCV), motivated by the will to improve second-language instruction at the elementary level, wanting to experiment with educational television, and recognizing the advantageous position that such a project would give it vis-a-vis research funding from the Department of Education, embarked on a research project entitled: "The utilization of audio-visual methods in the teaching of French." The audio visual refers, in this case, to the use of VTR equipment and educational T.V. programming.

The Board gained the necessary support from the Department of Education by pointing out that television, while known to attract and interest young viewers, is presently not used much as a teaching tool for second-language instruction. Further, the Board stated that 60% of the students watched colour T.V. at home and therefore would be more strongly influenced by colour T.V. in the classroom.

## B - Philosophy

The experiment was uncomplicated in its philosophy. If treatment groups showed gains in cognitive and affective areas subject to measurement, then television could indeed be beneficially used in second language instruction without elongating the instruction itself but supplementing it.

Additionally, the experiment could show whether black and white (b & w) and colour T.V. have different effects on the subjects; and therefore the treatment groups included both these options.

Finally, because the Department of Education spends considerable sums on school broadcasts such as the program which is used in this experiment; it was also important to assess the appropriateness of their broadcast schedules, as a contentious point amongst potential users had been that the broadcast time schedules were inappropriate or at best inflexible; and hence restricted the number of educational situations in which they could be useful.

## C - Objectives of Experiment

The objectives of the experiment were, therefore, to show if any of the following techniques, when used to supplement the present grade four elementary school curriculum, made any significant difference in the teaching of French as a second language to English-speaking children:

1) viewing (and related activities) of an appropriately-selected educational program as

broadcast off-air, whenever scheduling permitted (Broadcast is in colour).

2) viewing this T.V. program on a regular basis using B & W monitors and pre-recorded video tape.

3) viewing this T.V. program on a regular basis using colour monitors and pre-recorded video tape.

The results would assist the School Board and the Department of Education in deciding:

a) whether the educational broadcast used is valuable as a teaching supplement for French as a second language at the program's target age (8 - 12 years).

b) if the broadcasts are indeed valuable, to show whether different levels of effectiveness are gained by:

i) having video tape capabilities.
ii) using colour instead of b & w.

Answers to the above would indicate whether the substantial capital expenditures required for video equipment (especially colour) are worth considering further.

## III. Experimental Design & Critique

The experiment lasted from October 1975 to June 1976 and involved seventeen (17) grade 4 (ages 8 - 11) elementary school classes in eleven (11) schools. The schools fall into three types according to the community they service: rural, suburban, and urban.

The 17 classes (average 25 pupils) were allocated to one of three experimental groups (see C above) and one control group. These assignments were stratified-random within school types. The program selected by the Board's French specialists for use in this experiment is "Contes pour les jeunes," series I - III, target population 8 - 12 years. These series run for 32 weeks during the school year.

The normal French curriculum for the PRSBCV called for 30 minutes of French instruction per day, and the treatment groups substituted some of their regular instruction for the viewing and other complementary activities such as follow-up discussions.

The experimental design called for measuring the change (improvement) in the following linguistic skills: vocabulary acquisition, reading and auditory comprehension, ability in sound discrimination, and attitude towards the French language. To do this, an experienced and well-qualified French specialist was made part of the research team with the specific task of designing all the tests to be used in this project. At the start, a carefully prepared pre-test

was administered. Similar tests were given at the mid-point and end of the experiment, and the results analyzed. Sex, stream (general academic level) age and school type were used as moderator variables.

The research design was basically sound. Reliability measures of the test questions gave acceptable results (.60 - .73 range). The statistical analysis of the results was conducted by Dr. George M. Huntley of Concordia University, Department of Education, and is contained in a separate report by him entitled "Effect of a Different Instructional Media in Elementary French Education in the PRSBCV, 1975 - 76" (dated October 1976). Statistical tests were conducted at the $\alpha = .05$ level of confidence and treatment effects, as well as covariances, were not meaningfully significant. See Appendix "A" for Dr. Huntley's conclusions.

There were, however, several points about the design that could have been improved. To begin with, the TV program used for the experiment may not be an appropriate one on which to base a study whose implications could be quite considerable. The experiment was designed to measure the effectiveness of different methods, and <u>assumed</u> that the program being used is appropriate based on subjective assessments of the Board's personnel (French specialists and others) and on the producer's statements of target population.

The producer, the CBC, admits that the programs were only partially tested and then only during production. They were made in 1970 - 71 by French Specialists and were designed for supplementary French instruction. The target population was non-francophone Quebec children between 8 and 12 years old. The lack of test data on it weakens the experimental design, but it was the most appropriate of any programs available.

A second possible weakness of the experiment is that it may have tried to do more than it needed to. For instance, must it have tested for colour vs. b & w effectiveness, or could sufficient data have been obtained from studies already done in Canada and elsewhere? Certainly an examination of the literature would have indicated whether this segment of the study was indeed necessary, and no such examination was done.

Additionally, the number of treatment groups could also have been lessened by dropping the "viewing off-air" treatment group; because the number of classes that could possibly view the program at its broadcast time (9:30 a.m., in this case) could have been determined right from the start, and a simple statement been made as to the appropriateness of the broadcast time for wide use.

The two above modifications could have left only two independent variables. The subjects could have been split into two large groups, or the number of subjects could have been substantially reduced, thus simplifying the management of the experiment.

## IV. The Management System

### A - General Goals of a Management System

The goal of any management system is to bring together the right mix of resources in the most appropriate, cost-effective way to achieve the task being managed. "Management has one basic function from which all other functions are derived. This one basic function is coordination..." (Reynolds, 1963, p. 2-5). "A system is a set of parts coordinated to accomplish a set of goals." (Churchman, 1968, p. 29).

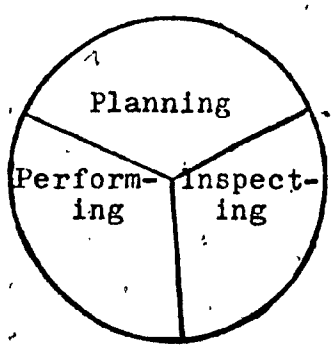
The coordination of the resources necessary to ensure the task (experiment) happens according to plan (design) is therefore the goal of this management system.

### B - Rationale for Design

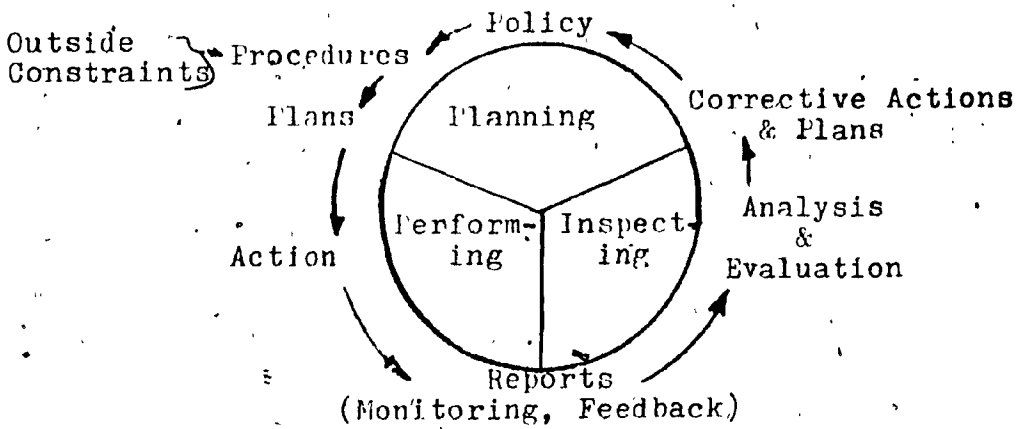
According to generally accepted management theory (Reynolds, 1963), any task has three component functions:

1) planning the task
2) performing the work to achieve the task
3) inspecting the task to see if it is to the standards called for in the plan.

Indeed, we can portray this concept of management diagramatically thus:



It can be embellished a bit to clarify the major subtasks required to perform a task. The following diagram is offered (adopted from Senensieb, 1963):




Any management system, (See Churchman, 1968) therefore would have to have in some form or another the components as shown above, and would have to have the flexibility to handle constraints and modifications to plan that become necessary (as a result of evaluating interim data supplied by the monitoring system).

Although straightforward, the diagram above encompasses every management function, if the terms are defined broadly as its author intended. For instance, "Plan" includes schedules, budgets and cash flows, contingency measures, and so on. Any management system that encompasses the functions as portrayed by the diagram, is potentially a working management system. The management system used in this study had all these components.

Of course, evaluation theory also should be heeded when designing a management plan for an evaluation study.

Unfortunately, evaluation theory is almost devoid of pure managerial content. Evaluation practice can be gleaned, however, for considerable guidance.

A recent evaluation study by Regan (1971) points to several good management practices which are adopted for this thesis. One is to take adequate steps to sell the merits of the project to the administrators and the teachers involved. Another is to provide adequate training and ample instructions to the teachers. A third is to ask the teachers themselves for their evaluation of the research project. Additionally, several other management pointers were adopted from Regan's study.

Brown (1971) outlines the steps of an evaluation study which form, indeed, the skeleton plan of this study and are management-type functions. Even some basic design problems are managerial in nature. For instance Brown (1971) states that the major problem in experimental design is the inability to assign students randomly to treatment conditions; and this obviously is also a management problem.

The "Hawthorne Effect", another cause of design headaches, is another problem subject to managerially-implemented solutions.

Robert Stake (in Worthern, 1973) advocates classroom observations by the research team as a check of what in fact is happening in the classroom. He also proposes that evaluation studies should include social descriptions of the students and descriptions of the instructional settings.

All of these help the researcher, not only in his design and final reporting, but more importantly in his managerial fine tuning during the carrying out of the study. In the same paper, Stake suggests that due to measurement imprecision, evaluators should seldom rely on one device even if some "homemade" devices have to be used. He goes on to emphasize that the evaluator should go beyond the client's stated needs and see if match-ups can be made between needs of the community, even the nation, and the particular project. For the thesis, both the pre-test analysis of possible instrumentation, and the enumeration of probable users of the final data influenced the design and the management plan. Stake's other recommendations (above) were also taken into account. Finally, a careful assessment of all interested parties, influenced the proposed structure of the final report. A brief examination of the management system follows.

## C - Management System Design

As mentioned previously, the general goal of the Management System is to examine the requirements of the research design and muster the appropriate and necessary mix of resources to execute the experiment within the stated budget and schedule of constraints, and according to the stated policies of the funding and administering agencies. Consequently, the Management System had the following objectives:

(1) To organize the experiment into its main steps and milestones, including those steps necessary to provide orientation and training for the principals, teachers, and others as required, and those steps necessary to provide analysed results in useful format. Within the resource constraints to apply schedule dates to those main steps.

(2) To identify, orientate and train where necessary all school board staff that would be involved in the experiment, and design and produce all forms, reports, tests, guides and all other material that will be required.

(3) To initiate the experiment and monitor its progress for compliance to experimental design, cost and schedule criteria.

(4) To alert appropriately the experimenters and administrators to any deviant situation that might threaten the integrity of the experimental design, the schedule, or the budget.

The Management System used for this project had all the components outlined in the previous section (Rationale for Design) as follows: the Research Committee (See Appendix "A") formulated the policy and prepared the procedures and plans. The project and A/V coordinators implemented it with the principals and teachers involved. Reporting of progress was done regularly by the classroom teachers through the weekly report titled "Teachers' Weekly Log", and through an exception reporting system called the "Problem Resolution" chart. (See Exhibits "A" and "B", p. 46 & 47). In-progress evaluation was done by the A/V and project coordinators, and when necessary the Research Committee was convened to evaluate and resolve deviant situations. (These reporting and evaluation functions are components of a cybernetic management system (see Miller and Starr, 1969, p. 20)).

Additionally, those items from evaluation theory mentioned previously (IV B - Rationale for Design) were incorporated into the management plan, as the more detailed discussion of the implementation of the project shows in Section IV - D: Implementation.

The budgetary management of resources was not as big a problem as it might have been for this experiment, because the largest expense ($20,000) was for the colour video-tape and monitor equipment for each school, and this was done by direct grant from the Department of Education (after the PRSBCV had convinced the Provincial Authorities of the merits of this research project). Consulting fees and miscellaneous expenses also were funded to the amount of two thousand dollars. All researchers other than the Concordia University consultant were regular employees of the Board. Some items such as extra video cassettes had been calculated into the operating budgets for the year and are not, therefore, separately controllable.

Following is a cost estimate of the management-type items, irrespective of which budget they come under. In brackets are the actual cost figures. (See next page).

To plan and control the schedule of the project, to provide an overview of it, and to facilitate communication; a quantitative approach was used. A CPM (Critical Path Method) chart (See Stibian, 1962) was developed early in the planning phase of the project (See Exhibit "F". This

## Budget Related to Administeration/Management of Project

Expenses Carried by Board's Operating Budget (not expenses in true sense. Shown here to demonstrate scope of project):

| Item | | Budget | Actual | Deviation |
|---|---|---|---|---|
| A/V Coordinators (2) | - hours | 260 | 180 | -80 |
| Principals (9) | - hours | 90 | 90 | |
| Teachers (11) | - hours | 120 | 145 | +25 |
| | - hours | (470) | (415) | (-55) |
| at about $10/hour | | $4,700 | $4,150 | -$550 |
| Director of Education 20 hrs. at $20 | | $400 | $400 | |
| | | $5,100 | $4,550 | -$550 |
| | | | | -(12%) |
| **Expenses Specially Funded for this Project:** | | | | |
| French Specialist 20 hrs. at $15 | | 300 | 450 | +150 |
| Consultant 50 hrs. at $17.50 | | $875 | $875 | |
| Secretarial & data processing | | 500 | 960 | +460 |
| Telephone | | 120 | 100 | -20 |
| Travel (mileage) | | 150 | 300 | +150 |
| | | $1,945 | $2,685 | +$740 |
| | | | | +(38%) |
| **Services Provided Gratis** | | | | |
| Data Processing by French Specialist | | | $125 | +$125 |
| Project Coordinator (Author of this Thesis): 150 hrs. at $15 | | $2,250 | $3,000 | +$750 |
| | | $2,250 | $3,125 | +$875 |
| | | | | +(39%) |
| **TOTALS:** | | $9,295 | $10,360 | +$1,065 |
| | | | | +(11.5%) |

Note: For explanation of overruns see VI - Evaluation, page 28.

chart does not adhere entirely to common CPM practice, but is adequate for this project). Although management techniques such as CPM and PERT (Program Evaluation and Review Technique) are normally used for very large projects, the construction of a CPM chart which showed all the major activities that comprise this project was very useful. CPM provides a plan in pictorial form by depicting each activity that must occur, as an arrow. The interelationships of activities is shown by positioning these arrows: an activity cannot start unless the one before it (pointing to it) is first completed. Dates are then applied to the chart and thus an overall schedule is created, showing the "critical path" - that is, the chain of activities that need the longest time and therefore govern the completion date. This CPM is then available for study and revision if the original plan becomes inoperable. Indeed, being able to evaluate alternative solutions to problem situations is one of the major benefits of using PERT or CPM techniques. No revision of this type was required for this experiment, however, because no major roadblocks were encountered. Small schedule deviations were resolved satisfactorily without significant changes to plan.

## V. Implementation

The most crucial part of the implementation of this experiment came long before the detailed management plan evolved, with the selection of the experimental team - the team that would formulate the experimental design and the management system; conduct and monitor the experiment; and evaluate the results. The success of the study would depend in large measure on the management team and this is confirmed by Noltingk (1959). The man ultimately responsible for this study, the Director of Elementary Education of the PRSBCV, put together a very substantial team to conduct this study. Known by the expedient name of "Research Committee", the team consisted of the following six people: the Director of Elementary Education himself, two expert A/V coordinators, a well-qualified French specialist, a teacher with considerable management experience who would be the project coordinator (and who is the author of this thesis); and in a consultive capacity a university professor with a background well-suited to this project. For an abridged curriculum vitae of each of the people, please refer to Appendix "A". The smoothness with which the experiment was generally conducted can be in large part attributed to the powerful team assembled to do it.

This management team was brought together in May of 1975 and began planning immediately. Through successive meetings starting June 1975 and culminating in September,

this team worked out the objectives of the study, the design, the logistics (number of schools, teachers, pupils, equipment, etc.) and detailed procedures for the study. Constraints and contingency measures were identified. Then the roles and involvement of the principals and teachers were articulated, paying close attention to the human realities and the personalities involved; and to the possible reactions of the pupils and parents.

One of the trickiest management problems was to solicit the wholehearted support of principals and teachers who would be involved. Not all principals had expressed enthusiasm at early mention of the project, and most teachers involved knew little until invited to participate in October 1975. It was up to the Research Committee to sell them on its value, and solicit their help.

Once the roles of the active participants (principals, teachers, technicians, and research team) were well defined, the team carefully thought out the best approaches to be used in soliciting the genuine support and resulting cooperation of the principals and teachers. Because of the Board's stated interest in ameliorating the French skills of the pupils, few problems were anticipated or encountered with the principals.

The situation with the teachers, however, was potentially troublesome. The team had to ensure that the teacher did not see the experiment as a threat to his decision-making powers in the classroom, to his job

security, or even to his job description. If any teacher's concern reached the teacher's union, and if the union concurred, the project could have been jeopardized. Therefore, the research team took great pains to inform the teachers and the union of the study, and to explain the teachers' involvement, and expected workload increase (very minimal). Both endorsed the idea, thereby eliminating the chance of misaccord. Nor could the teacher be allowed to view it as an easy way to get out of more demanding teaching. Any of these attitudes would bias the results.

In order to minimize the chance that any of the above situations would exist, the team had to convince the teachers:

a) That neither the research team nor anybody else had any preconceived ideas of what the results would show: i.e., the results might show that the control group (normal method of teaching) was better than the experimental methods.

b) that it was an experiment, and that any conclusions might be useful for the long range improvements of the educational process.

c) that treatment and control groups were randomly selected and had nothing to do with the teachers themselves.

d) that results would be made known to them at the end of the experiment.

e) that it would involve only nominal extra work on their part, for which the educational community would be grateful.

f) that they did not <u>have</u> to participate if they did not wish to, but that the team and the principals knew they were all capable, and that every class of pupils involved would help make the experiment a success.

With these points in mind, the team designed a thorough presentation and a carefully completed expository and instructional package. This package included a "Problem Resolution Diagram" (see Exhibit "B") which showed the teacher, at a glance, what to do or who to call under each kind of problem likely to arise. Invitations, with copies to principals, were sent out and the expository "workshop" was held in comfortable, suitable quarters with all teachers involved being mounted by the complete experimental team, each member expounding on one area. The tone was cooperative but business-like, with adequate time for answering both spontaneous and induced questions. The reactions of the teacher-audience were carefully observed by the team and the tone, speed, and emphasis of the presentation adjusted accordingly.

The results were very rewarding. All teachers seemed to understand the project's aims and its intended procedures, the schedule, the testing arrangements, and logistic and assignment constraints. All demonstrated support, although some less exuberantly than others. The less exuberant were approached individually during the discussion periods by team members who tactfully but methodically tried to extract the causes for the displayed apprehension, and put them to rest through careful, deliberate, clarification. The information packages (See Exhibit "C") were very well received and proved easily understandable. Their usefulness has since been demonstrated by the way teachers have handled

the project and coped with problems. Additionally, the sessions had as an objective to familiarize all the research team to the teachers and vise-versa. The friendly but earnest nature of interactions which developed indicated success.

Much time has been spent describing the management of this phase of the experiment because of its crucial nature, and the dependence of the rest of the project on it. The plan's methodological approach, and its provision for "mid-course" corrections (as outlined on p. 15), proved adequate for the circumstances.

The first step of the experiment proper was the pre-test. Once it was appropriately administered, and student "profile" information gathered (see Exhibit "D"), the project was underway. From that point, managing the project entailed obtaining weekly reports - called "Weekly Logs" (see Exhibit "A") - to ensure that everything was going according to plan. These report forms had been explained at the workshop, and had been endorsed by the teachers. They could be filled-in mostly by tick marks, but also invited the teacher to comment. This monitoring device proved very useful in some of the following ways:

a) it made it hard for the teacher to forget what he committed himself to do.

b) it gave the team a weekly check that a planned treatment was administered.

c) it identified technical problems early and alerted the A/V coordinators (who are part of the research team).

d) by following-up reported problems, or just late filing of reports, the team instilled in the teachers an assurance that what they are doing was important, and that the logs were being carefully read and acted upon.

The above functions of the logs were planned, and they have worked according to plan. Additionally, the log proved useful in providing information such as the following:

1) a significant number of the supposedly all colour broadcasts included a high proportion of b & w (25% was b & w).

2) Many of the teachers used the "Comments or unusual circumstances" invitation on the logs to express their feelings about the program viewed, and its usefulness or appropriateness to the French curriculum. These comments were also compared to test results to see how the subjective evaluations of the teachers matched up to the objective test results.

Both the above points demonstrate that a good management system will provide the evaluator with information important to his work that the evaluation instruments themselves might miss, and the first point particularly could have important implications in the evaluation of the results of the experiment.

As the project neared its mid-point (fourth month), and after studying the trends in the "weekly logs" and assessing other feedback the general feeling of the research team was that some kind of "booster" should be given to the teachers to let them know that they were still performing an important role, and to generally pick up their enthusiasm which in some cases was getting close to waning. This could be attributed at least in part to the four or five

days of strike held over the three previous months, due to contract negotiations. This "booster" was also prompted by the fact that the plan called for at least one classroom observation, and the two events could be made to coincide nicely. To this end a short "booster" letter was written to each teacher (See Exhibit "E") and was hand delivered by a member of the Research Committee who took the opportunity to sit in on a class during a showing (treatment). If the operating budget had permitted it, a mid-project meeting of all teachers would have replaced this letter. The researcher subsequently recorded his observation for filing and possible future reference.

Near the end of the program before any results were distributed, the management plan called for the administration of a questionnaire to teachers to more formally record their subjective evaluation of the curriculum change (treatment), and on the way in which it was implemented. This complies with recommendations by various researchers including MacKay (1975), Regan (1971), and Stake (in Worthen and Sanders, 1973).

Additionally, at the mid-way mark of the experiment, all the pupils in the control groups were given a token novelty item, a French comic book, to help counteract any Hawthorne effect, although informal queries to teachers reaffirmed that there was insufficient interaction between the various pupils to cause much Hawthorning.

The one more management item that needs mention is the care with which test results (October pre-test) were coded for Key-punching. Since the subjects (9 - 10 years old) were not likely to have much experience in mark sensing answers, it was decided to avoid this device in the classroom despite the potential cost saving. Consequently, answer sheets were provided where the pupil circled his choice. Subsequently, this data, along with pupil-description data such as, name, code number, age, sex, entry skills in French, and general achievement level were coded for key-punching, prior to scoring and analysis. Before key-punching, a 10% random sample was methodically double checked for accuracy of transfer. The acceptable limits for the sample were set at 98% accuracy, but no transfer errors were found. Similar checks with similar results were done for the mid and final tests.

The tests themselves were taken by members of the research team to ensure audibility, (tests were taped to ensure consistency across all groups) clarity of instructions, appropriateness of answer sheets, etc., and were not administered until potential trouble spots were ironed out. Feedback from the teachers (who administered the tests to their pupils) indicating testing went smoothly.

Just as care had been taken to initiate the experiment with the wholehearted support of the staff that would be involved, care was also taken, after the completion of the experiment, in thanking the participants, to reinforce the

fact that it had all been worthwhile and important. Summaries of the results, which they eagerly awaited, were also given to the participants. This was done after the principals and teachers had been asked to anonymously answer the questionnaire described in Chapter VI.

## VI. Evaluation of the Management System and Recommendations

### A. Evaluation Criteria for the Management System

The experiment will be deemed to have been managed satisfactorily if all of the following three summative performance criteria are met:

(1) The validity of the experiment is maintained by compliance to the experimental design.

(2) The experiment is completed on schedule. Major intermediate milestones are met. The analysed results are available to the client on schedule.

(3) The experiment is completed with no more than 15% deviation from estimated costs.

In addition to the above the following formative performance criteria will be examined to determine the degree of success or failure of various parts of the experiment:

(4) Deviant situations arising out of Objective (4) (p.15) are handled quickly and effectively to the satisfaction of the staff involved and the Research Committee.

(5) Board staff remain cooperative participants throughout the experiment. This will be gauged by analysing "weekly log" submittals (Exhibit "A") and by observation through school and classroom visits.

(6) No negative comments are received from other non-participating teachers on staff in the system, or the teachers' union, and no negative queries are received from parents.

(7) Questionnaires answered at the conclusion of the experiment by board staff involved show that the staff felt the experiment was well-managed.

(8) The six-member Research Committee feels that the experiment was well managed.

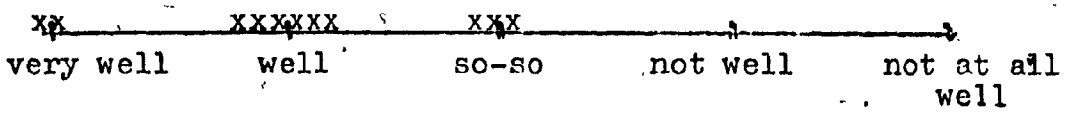
## B - Criteria Met

The previous chapter (Implementation) shows in detail the degree to which systematic planning was done. Indeed if we match the events with the performance criteria outlined in Section 'A' above we find that the three "minimally acceptable" criteria, (validity of experiment, schedule, and cost) were met. Details of these, and the degree of attainment of the "managed-well" criteria follow.

The overall schedule and budget were met within acceptable limits. The resources necessary to develop and carry out the project were brought together in a timely and effective manner. Training adequate to do the job was provided to the teacher; training materials and kits proved effective. All the steps of the experiment were conducted as planned. Careful monitoring of the program was maintained, and whenever problems arose they were handled in a manner adequate to prevent disruption of the program. The CPM chart, the deliberate feedback loops, redundancy features and the other systems-management devices described in Chapter V - Implementation, were instrumental in making these things happen.

The teachers knew where to turn for advice or help, and indications are that they did not hesitate to ask for assistance or offer suggestions. Testing went smoothly, and data coding and processing were handled accurately (double checking procedures consistently yielded negligible errors).

As a final test of the effectiveness of the management system, teachers and principals involved were given a questionnaire after the conclusion of the project, which they completed anonymously. This questionnaire had experimental and evaluative objectives: the experimental objectives were to provide some formative evaluation of the T.V. program used, and to provide summative input to compare with the results obtained from testing the subjects. The evaluative objective was to provide some formative feedback on the management aspects of the study. To this last end two questions on each questionnaire were designed to get the teachers' and principals' candid opinion of the management of the project. Responses showed strong approval of the management style used and confirmed that the implementation had been well-directed. For instance, to the question "Do you feel the experiment was well managed?", eight teachers of the eleven replied affirmatively, and the other three replied neutrally. The responses are shown below (instructions were to place an 'X' on the scale):




To the question "If the Board had another experiment to conduct, what improvements could be made to the implementation methods (management style) we used?" The principals made no germane suggestions. The above evidence suggests that performance criterion (7) - staff questionnaire responses favourable, was met. Criteria (6) - No negative

comments and (8) - Research Committee's feelings, were also met. Negative comments were not received. Additionally, the Research Committee, during several post-experiment wrap-up meetings, concurred that the project had been executed smoothly and had met its management objectives.

One management weakness was that the funded portion of the budget was overrun by 38% even though the total budget overrun (11.5%) was within the criterion limit, (albeit arbitrarily set) of 15%. This reflects the inadequacy of the estimate which could be written off to lack of experience in forecasting this type of costs. An examination of the overrun items by the Research Committee did not reveal any extravagances or expenditures made in order to correct mistakes.

Additionally and perhaps more importantly, however, the insufficient budget did affect, albeit not critically, the way in which the project was carried out. When the weekly logs and other indicators showed a need for a booster meeting of some kind mid-way through the experiment, the several hundred dollars required for conducting it were just not available, as the budget was already indicating an overrun situation. The less expensive but less effective method of a "booster letter" had to be used. This reflects a basic management-type weakness inherent in the way much educational research is funded: the people directly responsible for the proper conduct of the research do not have the authority to procure additional funds if required.

In principle, responsibility and authority should correspond.

The above is an excellent example of how performance criteria (4) - handling deviant situation, and (5) - keeping staff cooperative, were partly met: the problem was identified early, a solution was proposed which did not meet the budget constraints and still got the problem resolved satisfactorily enough not to jeopardise the experiment.

Aside from demonstrating the need for a dynamic management system the overrun problem described above also shows the need for experimenters to try to get acceptance for some type of "flexible budget", adapted perhaps from those described by Horngren (1965). If acceptable criteria for allowing increases or expected decreases in expenditures could be pre-determined, a "flexible budget" approach, with its built-in contingency funding, would allow for solutions which would not compromise the integrity of the experiment.

## C - Analysis of Costs and Benefits

Costs and benefits should be reviewed at two levels: the Board and Provincial levels.

From the School Board's point of view, the cost-benefit situation is heavily weighed to the benefit side. Looking at it as frankly and simplistically as possible, for a mere $740 outlay (to cover the actual overrun - see IV - C for budget) and the organizational and technical skills provided by regular salaried employees, the

Board got in return $20,000 of colour video-taping equipment and the very considerable additional benefits of (1) having the distinction of carrying out a fairly sophisticated study, (2) having the knowledge of the results first hand, (3) having acquired expertise in the implementation of this type of study. Even if we add to the $740 actual outlay the considerable worth of the organizational skill of the director of elementary education, and the value of the idea for the study and the effort put into the perparation of documentation to "sell" it to the Provincial Government which came from one of the A/V coordinators; the benefit side still seems to outweigh costs several times over.

The provincial authorities on the other hand invested some $22,000 in this project. The considerations on which they approved this expenditure most have included the following points:

(1) If the study showed significant differences then budget appropriations to school boards for the purpose of video equipment to enhance instruction would have to be increased. This is to be weighed, of course, against the pedagogical benefits of expenditures on other resources. The total expenditures that could nevertheless have resulted from this could have eventually run into the millions, especially if the costs for the programming material required to satisfy the resulting demand are included.

(2) If the study showed no significant differences then expenditures for this type of equipment would be withheld in favour of other resources. Additionally, and perhaps more importantly, a re-examination might be ordered of the scheduling policies and programming practices of educationally-oriented broadcasts, since substantial resources are presently committed to producing and broadcasting educational materials.

From even a cursory study of the two possible outcomes above, it is obvious that the payoff, regardless of outcome, is immensely greater than the cost.

Since the results showed no significant difference the Provincial authorities should handle with caution school board requests for video equipment for second language instruction. (The study cannot be generalized into other areas - for instance, the instructional value of video equipment to a drama class). Additionally, the Province should carefully review its broadcast program practices. For example, of what benefit was the broadcast to the treatment classes assigned to the "off-air" treatment (see III - Experimental Design) since they were unable to view but a few programs because of broadcast times?

The Provincial authorities should fund at least several other similar studies - to determine the usefulness of their broadcasts (T.V. and radio) from the target-population reached and content points of view. These studies would invariably provide information well worth the money.

Perhaps it is time for all funding authorities and the academic community to direct more effort to finding better ways to use the knowledge already available. Perhaps pushing the frontiers of empirical knowledge further and further beyond our capability of using the knowledge should be de-emphasized for a period long enough to allow a catch-up. A government educational technology department, with

the widest possible mandate, might be a good vehicle for the directing of this kind of academic emphasis, as long as this department does not have any vested interest in any particular program.

D - Additional Conclusions and Impressions

Additional to the evaluative remarks made so far in this chapter, certain other conclusions and impressions deserve notice. A statement of each such conclusion or impression follows, along with some substantiating comments:

(a) The research team must be well qualified.

Although almost axiomatic, the truth of this statement became apparent more than once as the myriad of smaller problems which kept cropping up were usually dealt with easily and effectively. Hardware that became faulty was quickly looked after, teacher incompetencies in equipment use were promptly corrected, and even a possible personality conflict between two teachers was predicted and counteracted. "Red tape" was masterfully avoided, and numerous other road blocks circumnavigated, because of the combined skills and expertise of the research team.

(b) The research team must include a relatively high-ranking member of the client organization or at least have ready access to one.

Because a high-ranking Board official (Director of Elementary Education) was part of the research team it was possible for the Research Committee to take decisions without having to go through the sometimes lengthy procedure of referring matters to the Board. Even matters beyond the direct authority of the Director of Elementary

Education were handled expeditiously because he took it upon himself to get the required clearances quickly: obtaining time off for the project co-ordinator (engaged as a full-time teacher by the board) is but one example of this; covering the budget overrun is another.

(c) the planning of the project from the management point of view must be well advanced before implementation starts.

In the opinion of the author the project would have probably been a failure if pre-planning had not been done to the considerable extent it was. It would seem that the frequency and magnitude of problems that arise bears an inverse relationship to the amount of planning done. Furthermore, the researchers can spend far more effort to resolve the problems that do arise, since a well planned project requires much less day-to-day management attention.

(d) great attention must be paid to "selling" all active participants and soliciting their services, which should be voluntary. Care must be taken to maintain a positive attitude throughout the project.

If the people involved in the day-to-day activities required to carry out the project do not themselves feel committed to it, the chances of its success are greatly diminished, because the internal validity of the project can very inadvertently be scuttled. Imagine, for instance, an uncooperative teacher who is participating because her principal told her to, and who frequently misses showing the program because "I didn't seem to get the colours adjusted properly and the people looked green which I can't stand, so

I turned it off and carried with a normal lesson".

(e) The "human skills" of the researchers are every bit as important as the technical skills.

To accomplish unity of purpose, and an enthusiastic, positive attitude; to "sell" the project to all teachers, administrators, and others involved, and to methodically resolve or side-step controversies, jealousies, and objections which did crop up, was not an easy task. Understanding human nature, being able to sense others' feelings, and being able to implement tactful and effective solutions, were the skills the individuals on the research team had to have to execute the plan adequately.

This author feels that any project would flounder if its researchers did not have ample human skills. Technical skills guarantee the adequacy of the experimental design, the instrumentation, etc. Human skills ensure that implementation is executed in such a way as to maintain the technical integrity of the experiment.

(f) Putting together a high-powered research team can increase the administrative costs of the project, but it is well worthwhile.

Again this statement is almost axiomatic. An experiment implemented in such a manner that the results are invalid has been a waste of money no matter how small its budget was.

(g). Management theory was very relevant and useful in systematizing this study and could be used to bring the benefits of a systems approach to any research study.

A well-run experiment is probably one that is being methodically and systematically managed whether the researchers know the concepts of the systems approach or not. (For a basic exposé, see Matthies, 1976). It can, nonetheless benefit from a more deliberate attempt to manage by proven management principles. A concerted effort towards methodic management will result in a management system that relies less on intuition by using various instruments to form cybernetic feedback loops. (See Cleland, 1972). Furthermore, it decreases the importance of individual research-team members and provides for continued good management even in the absence of key researchers. This last part alone should be enough to substantiate the value of a systems approach.

Finally the systemization of an educational research experiment represents to this author a kind of triumph in the union of two heretofore little-related areas: educational research and management systems. Very often scholarly pursuits are carried out oblivious to others in seemingly unrelated fields: perhaps few fields are as unrelated as they sometimes seem. Following (g) above, this item is self-evident and indeed could be stated in more generalizable terms. It furthers the argument that scholars should attempt to integrate their considerable knowledge areas into a more unified and consequently more useful body of knowledge.

E - Assessment of this type of thesis

One of the greatest benefits of this thesis, in the author's opinion, is that it presents a different emphasis in educational research. Although one can generally find many references to management-type activities in the "Discussion" section of many research studies, the management aspects have not been given their due. This author suspects that many a study suffered from inadequate, unmethodical management.

Further theses of this nature, concentrating on the management system requirements of larger scale studies, could be very useful in identifying those management methods and human skills most likely to be useful. This does not mean that the systems approach is of no value to the small-scale project, but naturally the degree of control needs to be far greater where the resources involved are large.

Of course, this particular aspect of research - the management aspect - is not as fertile a ground for continued concentration as more empirical subjects, and after some attention the point of diminishing returns will be reached quickly. However, continued attention to the implementation of any project would always be relevant to the serious client of research as a check that the integrity of experiments was maintained.

With governmental and other research budgets generally increasing, it may evolve that funding organizations will

want assurances that the research will be done in the most efficient and valid manner. In other words, the funding organization may want assurances of value for money and honesty of results. At times the research organization vying for the funds may not be the best judge of this. Perhaps the funding agency will then have to send in its own "Systems Analysis and Quality Control team" to ensure control. This would indeed parallel some methods used by Canadian and American Defence departments to fund defence research (see Block, 1971). Additionally, it parallels how most companies ensure that their products are well built and that the scrappage rate on the production lines is at acceptable levels. Corporations usually have an M.I.S. (Management Information System) department (see Cleland, 1972) that is freed from other departments' influence by reporting directly to the president. The M.I.S. ensures the information needed by the top executives is extracted, processed properly and presented meaningfully. The Quality Control group makes sure that the information fed to the M.I.S. represents the conditions as they actually exist.

Perhaps, then, the management systems group of a research team would work with the research team (as their ultimate goal is the same), but also report to the funding authority as an assurance that the integrity of the experiment is maintained and that the resources have been efficiently deployed.

Perhaps this infusion of management sciences into educational research is one of the concepts required to enhance Davies' (1971, p. 4) "new conceptual framework against which decisions involving change and innovation can be made".

In summary, then, this author feels that another ten or twenty studies of this nature may be useful in delineating the areas and techniques of management science that are most applicable to systematizing the management of educational (and other) research, and, after that, a small but continuous effort would enable researchers to keep up with the applicable "state of the art" developments in management science.

The continued value of the type of work involved in this thesis, however, lies mostly in its practical application. By providing a project management framework with appropriate feedback and control mechanisms to ensure that the design, implementation procedures, schedule, costs and side effects are adequately executed, the type of systems approach suggested by this thesis will put more discipline into the conducting of research.

## VII. Report to Client

The letter on the following page and a copy of this thesis, comprise the report submitted to the client, the Protestant Regional School Board of Chateauguay Valley.

# REFERENCES


Block, E.B. Accomplishment/Cost: better project control. Harvard Business Review, 1971, May-June, 110-124.

Brown, F.G. Measurement and Evaluation. Itasca, Ill.: F.E. Peacock Publishers, Inc., 1971.

Churchman, C.W. The systems approach. New York: Dell Publishing Co., Inc., 1968.

Cleland, D.I. and King, W.R. Management: a systems approach. New York: McGraw-Hill Book Company, 1972.

Davies, I.K. The Management of Learning. London: McGraw-Hill Publishing Company Limited, 1971.

Guthrie, W.A. Management and systems. In T. Radmaker (Ed.), Business Systems. Cleveland: Systems and Procedures Association, 1963.

Horngren, C.T. Accounting for Management Control: an Introduction. Englewood Cliffs, N.J.: Prentice-Hall Inc., 1965.

Mackay, A. Through the glass darkly: the realities of program evaluation. Edmonton, Alberta: A paper prepared for the Canadian Association of Curriculum Studies Annual Conference, June 1975.

Matties, L.H. The Management System. New York: John Wiley & Sons, 1970.

Miller, D.W. and Starr, M.K. Executive decisions and operations research. Englewood Cliffs, N.J.: Prentice-Hall Inc., 1969.

Noltingk, B.E. The Human Element in Research Management. Amsterdam: Elsenier Publishing Company, 1959.

Regan, E.M. The development and dissimination of a curriculum program package. Curriculum Theory Network, 1971, 7, 63-71.

Reynolds, R.W. Organization concepts and design. In T. Radmaker (Ed.), Business systems. Cleveland: Systems and Procedures Association, 1963.

Senensieb, N.L. Systems functions, concepts, and programs. In T. Radmaker (Ed.), Business systems. Cleveland: Systems and Procedures Association, 1963.

Stilian, G.N. and others. Pert: a new management planning and control technique. New York: American Management Association, 1962.

Worthen, B.R. and Sanders, J.R. Educational evaluation: theory and practice. Worthington, Ohio: Charles A. Jones Publishing Company, 1973.

## TEACHER'S WEEKLY LOG

### ELEMENTARY FRENCH RESEARCH PROJECT

TEACHER _____ CLASS _____ METHOD _____ MONTH _____

| | MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY |
|---|---|---|---|---|---|
| TAPING | | | | | |
| INTRODUCTION | | | | | |
| SHOWING | | | | | |
| FOLLOW-UP | | | | | |

Comments or
Unusual Circumstances _____

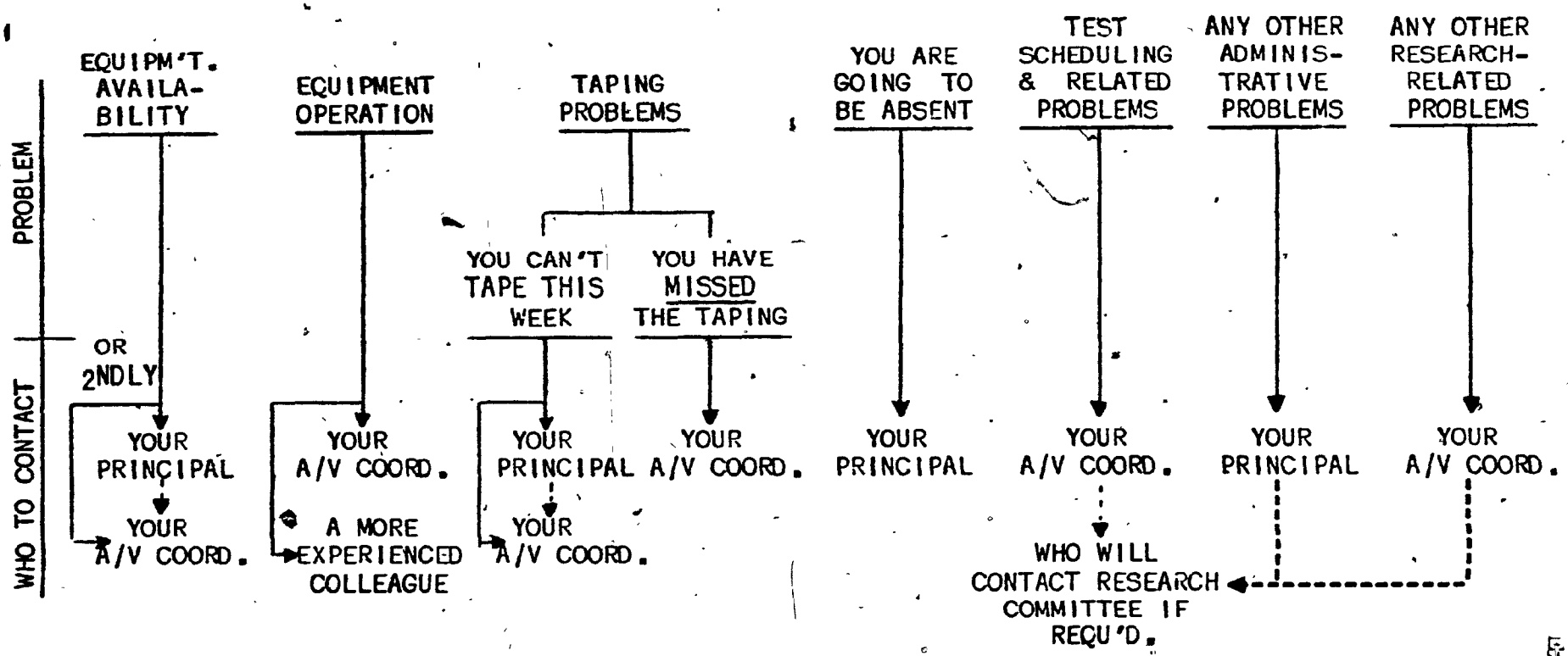
Please forward to A-V Coordinator
at end of each week of Project.

Exhibit "A"

## PROBLEM-RESOLUTION DIAGRAM

Oct.'75
PRSBCV

### ELEMENTARY FRENCH RESEARCH PROJECT




ZONE "A" COORDINATOR - JOHN WATSON -- TEL.: 829-2381
ZONE "B" COORDINATOR - G. CAMPBELL -- TEL.: 691-5211

Exhibit "B"

Teacher Information Mat'l (Partial Package Only)

# CHATEAUGUAY VALLEY REGIONAL HIGH SCHOOL

ORMSTOWN, QUE. JOS 1KO

OFFICE OF THE PRINCIPAL

Dear

By now you are undoubtedly aware of some of the details of the French Research Project being conducted by our Board.

You and your principal, along with your level 4 pupils, are key to this experimental study, which will help the Board evaluate several promising methods of teaching elementary French.

To this end, a morning briefing session has been planned for you and all the other participating teachers. This has been arranged with the approval of your Principal, and this session is taking place as follows:

Teacher Briefing
Thursday, October 2, 9:30 sharp - 12:00 a.m. at
Mary Gardner School

The starting time is 9:30 to assure that everyone can get there on time. Should you foresee any problem in getting to the session, please contact your principal so that arrangements can be made. Please bring with you a copy of your schedule.

We hope you will share our enthusiasm at the opportunity to participate in the experimental study which could render beneficial results for us and the pupils we teach; and which could have province-wide implications.

We anticipate your presence and contribution at this briefing session.

Yours truly,

ELEMENTARY FRENCH RESEARCH COMMITTEE

| | |
|---|---|
| Winton Roberts | G. A. Campbell |
| Dr. G. Huntley | Jean Guy Morin |
| Tony Tsoukanas | John D. Watson |

# CHATEAUGUAY VALLEY REGIONAL HIGH SCHOOL

ORMSTOWN, QUE. J0S 1K0 OFFICE OF THE PRINCIPAL

Dear

This note is a follow-up to the Elementary French Research Project presentation to you at the last principals' meeting. Your school has been chosen to participate in the following manner:

| No. of Classes | Level | Teacher | Method Code (See attached sheet) |
|---|---|---|---|

We hope this selection is acceptable because the rules of random selection which we applied ought not be broken if the study is to maintain its integrity. However, if you can forsee any difficulty in these classes participating as assigned, please contact your A-V Coordinator on the Research Committee immediately.

As you know, we are bringing all the French staff involved, together for a briefing and training session on the morning of October 2 and we hope to solicit their interest and cooperation at that time. Again, your support is very important. Please feel free to pre-brief the participating teacher at your school as you see fit, emphasizing that the assignments have been made solely through random selection to satisfy the requirements for experimental validity.

More details about program time, video taping, and anticipated procedures will be available at the October 2nd session, to which you are also invited should you wish to attend. The meeting's agenda is attached.

We thank you for your cooperation,

Yours sincerely,

FRENCH ELEMENTARY RESEARCH COMMITTEE

Winton Roberts G. A. Campbell
Dr. G. Huntley Tony Tsoukanas
Jean Guy Morin John D. Watson

Enc.

# CHATEAUGUAY VALLEY REGIONAL HIGH SCHOOL

ORMSTOWN, QUE. J0S 1K0 OFFICE OF THE PRINCIPAL

## DESCRIPTION OF METHOD CODE

METHOD A - Normal program

METHOD B - Normal program, but with 30 minutes of color video tape programming and complementary activities.

METHOD C - Normal program, but with 30 minutes of black and white video tape programming and complementary activities.

METHOD D - Normal program, but using whenever possible, a 30-minute network broadcast television program in color.

| STUDENT NAME | STREAM* | FRANCOPHONE** | LOW RATIO STUDENT*** | AGE | SEX |
|---|---|---|---|---|---|
| | H | | | 9 | F |
| | H | | | 9 | M |
| | M | | | | M |
| | L | | | 9 | M |
| | M | ✓ | | 10 | M |
| | L | ✓ | ✓ | 10 | F |
| | H | ✓ | | 10 | M |
| | H | ✓ | | 9 | F |
| | H | ✓ | | 9 | F |
| | M | | | 10 | M |
| | H | | | 10 | M |
| | H | | | 9 | F |
| | M | ✓ | | 9 | F |
| | H | | | 10 | M |
| | H | ✓ | | 10 | M |
| | H | ✓ | | 9 | F |
| | H | | | 9 | F |
| | M | ✓ | ✓ | 10 | F |
| | L | ✓ | | 10 | M |
| | H | ✓ | | 9 | M |
| | M | ✓ | | 10 | M |
| | M | | | | F |
| | H | ✓ | | 10 | F |

* Stream: "L" for LOW, "M" for MEDIUM, "H" for HIGH. Use this code to indicate which level the student is in French instruction.

** Francophone: to be interpreted as anyone who is orally bilingual.

*** Low Ratio: Student who attends Special Ed. classes part-time or full time.

Exhibit "E"

BOOSTER LETTER

C O P Y

January 5, 1976

Letter to 12 teachers participating in Elementary French Research Project

Re: Elementary French Research Project

As we near the mid-way mark of the project, we'd like you to know that it is being executed satisfactorily, thanks to your efforts and those of your colleagues.

Despite snags that have occasionally developed here and there, the job being done by everyone is for the most part excellent.

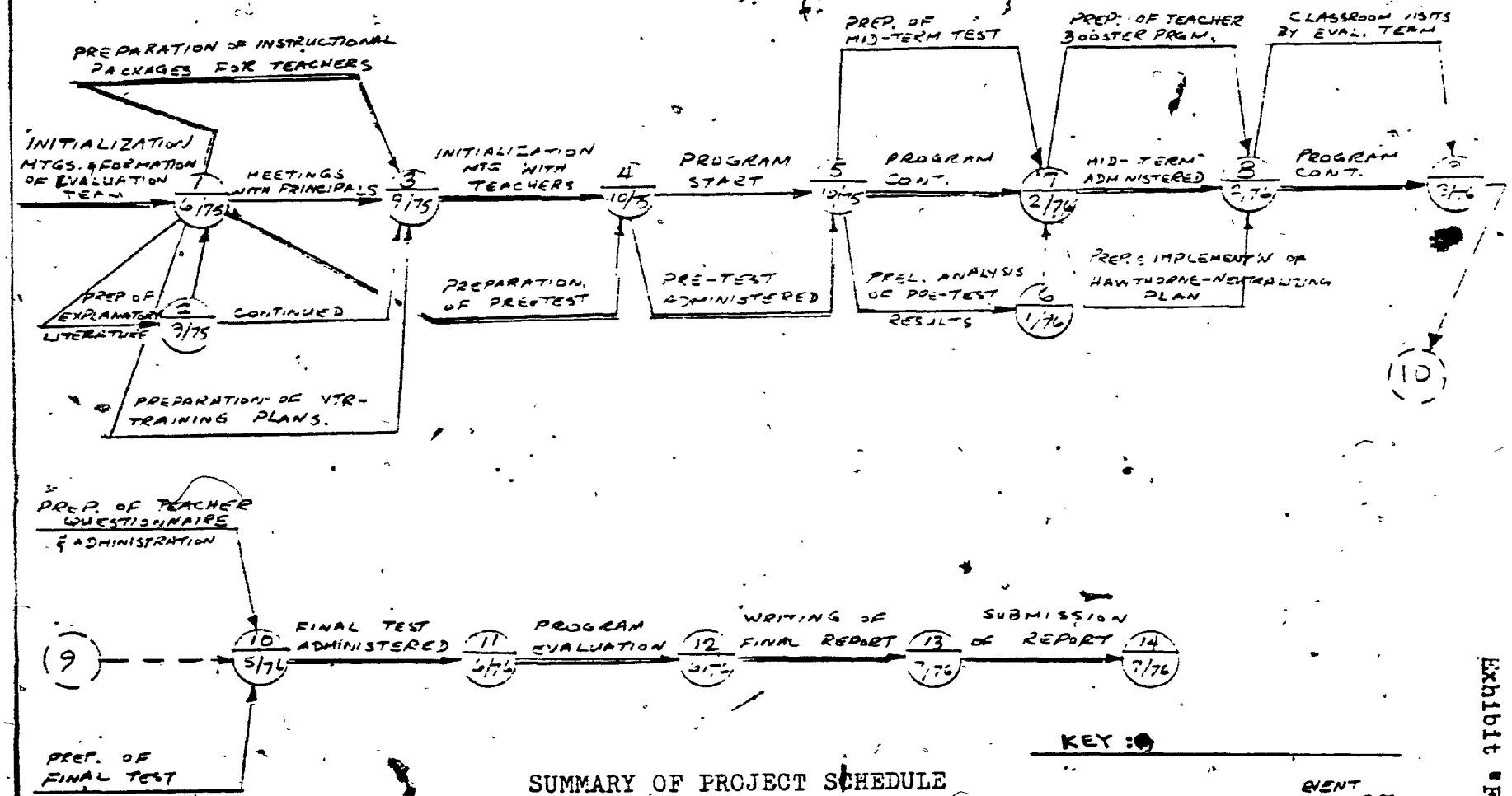
It remains important, of course, that we all continue with our assigned duties in a careful and deliberate manner, so that the project comes to its proper fruition.

Thank you very much for your efforts and cooperation.

ELEMENTARY FRENCH RESEARCH COMMITTEE

| | |
|---|---|
| Winton L. Roberts | Tony Tsoukanis |
| Dr. George Huntley | Jean Guy Morin |
| G. A. Campbell | John D. Watson |

cc: Committee Members




SUMMARY OF PROJECT SCHEDULE
IN CPM (MODIFIED) FORM

Exhibit "F"

Appendix "A"

Short Curriculum Vitae

of Research Committee

(June, 1975)

G.A. Campbell has ten years' experience as a teacher and eight as audio-visual coordinator in the Protestant Regional School Board of Chateauguay Valley (PRSBCV) schools. He is a veteran of many A-V conferences and originally organized the media centre for Chateauguay elementary schools.

G.M. Huntley, Ph.D., has been professor in the Department of Education at Concordia University for three years, where he teaches educational psychology, measurement and evaluation, quantitative methods and research design, and instructional systems analysis. He is also involved with research in the teaching of basic language skills particularly to immigrants, and instructional design; and does consulting in research design and evaluation.

J.-G. Morin is the French Animator for the PRSBCV. He has twenty-five years teaching experience in French as a second language at both elementary and secondary level; as well as experience as adult education coordinator for French as a second language. Additionally, he has done pioneer work in French immersion programs. He has studied at Laval University and received training in audio-visual methods at Montreal and Quebec City.

W.L. Roberts, M. Ed., has been Director of Elementary Education of the PRSBCV for the last four years. Prior experience included eight years as teacher and twenty-one as principal. He was six years on the Management Committee of Quebec School Telecasts, and chairman of the Auido-Visual Committee of the Protestant School Board of Greater Montreal.

A.S. Tsoukanas, B. Comm., author of this thesis, is an M.A. (Educational Technology) student who undertook to coordinate the planning and implementation of this experiment in fulfillment of his magistral thesis requirements. He has been a full-time teacher for the PRSBCV for four years. Previous experience included three years with a firm of management consultants, and two years of program management in the aerospace industry.

J.D. Watson, B.A., has been audio-visual coordinator for two years at the PRSBCV. Prior experience included five years of teaching. He has also done post-graduate work in psychology and educational technology; and to a great extent formulated the initial proposals which led to this experiment being sponsored by the Quebec Department of Education.

APPENDIX "B" (LEAVES 56-68) NOT MICROFILMED FOR

REASONS OF COPYRIGHT.

Huntley, George M. Effect of Different Instructional Media in Elementary French Education in the PRSBCV, 1975-76.

PLEASE CONTACT THE UNIVERSITY FOR FURTHER INFORMATION.
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