Applying Principles of Collaboration to Videodisc Design: Profile of a Successful Project

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Abstract: Although teachers and administrators in Edmonton Public Schools were satisfied with their approach to continuing professlonal development, there was a desire to work more closely with the Faculty of Education to develop high quality Instructlonal materials that would meet both inservlce and preservice needs whlle contributing to the collaborative relatlonship evolving between the two institutions. For some time the Faculty of Education has explored innovatlve approaches to preservice teacher education, one of which has been the development and implementation of two interactive videodiscs for use in preparing third-year students for a practicum experience. A collaborative design project resulted in a third videodisc that would meet both preservice and inservice needs of the participating institutions. The authors maintain that their project was successful because the team members consciously attended to and utilized highly complex group process skills. Conflict resolutlon was routinely achleved through adherence to a model of cooperative group process as delineated by Johnson and Johnson and others (1980, 1982, 1986).

Résumé: Quoique les professeurs et les administrateurs dans les écoles publiques onton sont satisfaitse leur développement professionnel, il y avait un dir de travailler directement avec la Faculteé d'éducation enfin de développer du matériel éducatif d'une qualité supérieur qui réponderait aux besoins des futurs enseignants et de ceux qui enseignent déjà et ainsi contribuer à créer une collaboration entre les deux instituions. Depuls un certain temps la Faculté d'éducation a explors approches innovatrlces dans l'enselgnement des futurs enseignants. Un de ces approches fut le développement et l'implantation de deux vidéodisques interactifs pour mieux préparer les étudiants en troisième année à leur futur travail. Un projet de collaboration fut le résultat d'un troisième vidéodisque répondantux besoins des futurs enselgnants et de ceux qui enseignent déjà dans les institutions participantes. Les auteurs concluent à une réussite du projet car les membres de l'quipe travaillaient consciencieusement et ils utillsaient des techniques méthodiquesistiquées. La résolution des conflits se réalisait à l'aide d'un modele d'un gorupe coopératif méthodologlque tel que dcrlt par Johnson et Johnson et ais (1980, 1982, 1986).

INTRODUCTION

Faculties of Education have become increasingly aware of the need to forge inter-organizational arrangements with local school systems in an effort to improve the quality of services (preservice teacher education) that the institu-

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tion delivers. In such an arrangement, participating organizations define themselves as interdependent; collaborating, with a common goal, in a shared decision-making process that is qualitatively different from more traditional interactions (Intriligator, 1982).

The Faculty of Education at the University of Alberta and Edmonton Public Schools had been engaged in a number of collaborative activities focusing on the teacher in the classroom. The design and production of teacher education materials, however, had largely taken place in the Faculty without the instructional input of practitioners, whose participation was limited to providing the setting, the teaching, and the actors (students).

Although teachers and administrators at Edmonton Public Schools were satisfied with their collegial coaching inservice approach (Joyce & Showers, 1986) to continuing professional development, there was a desire to work more closely with the Faculty of Education to develop high quality instructional materials that would meet both inservice and preservice needs while contributing to the collaborative relationship evolving between the two institutions.

Concomitantly, the Faculty of Education had been interested in the use of interactive videodisc technology for some time and had designed and produced two Level II videodiscs for use in an undergraduate pre- practicum course (Engel & Campbell-Bonar, 1989). As the skill of questioning was one major focus of this course the Faculty agreed to undertake a third videodisc project in collaboration with Consulting Services at Edmonton Public Schools. One goal of this project was to design and produce one interactive videodisc that would meet a multiplicity of needs at both the preservice and inservice levels; although the outcome of the collaborative process itself was a major focus for the design team members.

THE COLLABORATIVE TEAM APPROACH TO INSTRUCTIONAL DESIGN

The collaborative process has been described from a number of perspectives including the action research paradigm (Oja & Smulyan, 1989), from the cooperative group process perspective (Johnson and Johnson, 1982), and from special education's multidisciplinary team approach (Idol, Paolucci-Whitcomb, & Nevin, 1986).

Generally, the process involves teams of people with diverse expertise in an interactive process in which all members work with parity to mutually define a problem. Collaboration is characterized by mutual understanding and consensual decision-making resulting in creative solutions, that are enhanced and altered from those that any team member would produce independently, and common action (Tikunoff, Ward & Griffen, 1979; Idol, Paolucci-Whitcomb & Nevin, 1986; Oja & Smulyan, 1989).

Advantages of the process which are particularly applicable to collaborative videodisc design projects include increased sharing of material and human

resources across professional disciplines, facilitation of liaison activities among institutions, and cost effectiveness (Idol, Paolucci-Whitcomb & Nevin, 1986); the generation of unique solutions (Falk & Johnson, 1977); and better decision-making resulting from the pooling and recombination of resources (Laughlin, Branch & Johnson, 1969).

DeBloois (1982) describes an interactive videodisc system as an entirely new medium with unique characteristics that are unlike each of its video and computer components. He argues that a videodisc design effort must be "interdisciplinary in nature, capable of a full range of activity, crossing professional specialties, and involving personnel from disparate fields" (p 48).

In discussing the course team approach to the design of Distance Education materials, Naidu (1988) suggests that for the majority of team members the experience is an innovation which, if inexpertly managed, is the source of great conflict within the team. Naidu suggests that as institutions become more and more aware of the complexity of instructional design, the greater the tendency to adopt concerns-based collaborative models.

At the center of both of these "models" is the instructional designer, often, as in this case, the project manger, who must be sensitive to the entry-level behaviours and changing needs and aspirations of all the team members while at the same time moving the project towards successful completion. DeBloois suggests "organic" organizational structures contribute best to this environment because they allow for situational leadership, encourage a better climate for developing interactive systems, allow for consensual decision-making, participative management, and peer critique and evaluation.

It is our contention that adopting many of the attributes of the collaborative process will provide an excellent model for team-based instructional design projects.

THE PROGRAM DESIGN AND RATIONALE

In this article, the resulting videodisc is of interest only as the *by-product* of a successful collaborative process, but it is described briefly here to provide a basis for the discussion of the collaborative nature of the design process.

The Faculty had been exploring the use of simulation materials in teacher education for some time, but this Level II videodisc emerged early in the design process as a tool for direct instruction. The design of *Do I Ask Effective Questions? or, I Can Hardly Wait to Hear What I'll Ask Next!,* reflects this approach by its organization into discrete modules of instruction, each dealing with one topic of "questioning". Module topics include those addressed by Edmonton Public Schools' T.E.P. (Teacher Effectiveness Program) as well as topics of specific interest to preservice teachers such as the role of questions in a power struggle. Questioning strategies are modelled by Edmonton Public Schools teachers in grades K-12, in all core subjects and in several optional curriculum areas. Segments involving trainable mentally handicapped

adults and Grade l/2 students in the Academic Challenge (gifted) program are included. A second side provides a database of eight unmediated teaching sequences for further practice in identifying questioning strategies.

As with the previous two titles in the *Effective Teaching* series, thedecision to produce a Level II videodisc was taken before the design process was initiated. The reason for breaking this instructional design "rule" was threefold:

Edmonton Public's Consulting Services team was interested in exploring the use of newer technologies in their inservice programs, and was willing to provide both release time for one consultant and share equally in the actual production costs of a videodisc. The commitment to this instructional approach was evident in the Consulting Services' purchase of one videodisc player ta support the disc before the project was completed.

In the Faculty of Education, the course for which this series had been conceived indicated a continuing interest in providing alternatives to whole group instruction in teaching strategies. The course coordinator, a senior professor in the department, suggested that personal involvement in the design of a third videodisc would enhance his professional experience: the Chairman of his department also provided release time for this purpose.

Preliminary discussions with both client groups revealed a shared need for a resource that would: provide examples of many different teaching strategies, model reflective teaching practices and self-monitoring techniques, and sup port opportunities for both mediated and independent practice with new concepts. Random access, high-quality still-frame graphics, two audio tracks, and learner interactivity capabilities were better accomplished by videodisc than other, more conventional media formats.

COLLABORATING ON VIDEODISC DESIGN

The collaborative model of instructional design typically involves a large number of people who are all responsible for their specific areas of expertise (Naidu, 1988). In this case, a core team consisting of four was expanded at various points in the design process to include bath technical and content experts, and end users. This multi-level approach to team design has been adopted and refined by the Instructional Technology Centre in the course of many instructional design projects for the Faculty of Education (Mappin & Campbell-Bonar, 1990), but this complex strategy can be problematic in the hands of inexperienced ID teams. The field abounds with horror stories of failed collaborative efforts, many of which have been revealed at professional meetings or in private conversation with the authors.

Johnson, Johnson, and Holubec (1986) make a clear distinction between groups and cooperative groups, focusing on such aspects as positive interdependence, heterogeneity, shared leadership, shared and individual accounta-

bility, and the development of pro-social skills (p10). We believe that many team-bawd ID projects fail because team members are competitive, inexperienced in group process, and task-oriented to the exclusion of conscious attention to group process. Although the raison d'etre for many traditional ID teams is the end product, for us the collaborative group process was the priority.

As Naidu (1988) points out, collaborative team approaches to instructional design have been "quite notorious for their inability to coexist without serious difficulties" (p. 169). Familiarity with factors traditionally responsible for unsuccessful collaborative efforts (Johnson and Johnson, 1982) may contribute to more effective management of the administrative and affective domains involved in such a process:

1) *Lack of group maturity and lack of time:* members need time and experience together to develop into an effective decision-makingteam. The project manager must be honest about the time requirements for a collaborative videodisc design project at the outset in order to negotiate a reasonable project timeline. External time pressures may detrimentally influence this process.
   For example, underestimating the time requirements, in an attempt to downplay the commitment that was required, would have severely impaired the feelings of trustworthiness of the project manager. Her honesty and integrity at the outset of the project caused the group members to ally themselves with the project. Later, when external forces inevitably caused havoc with timelines (Johnson and Johnson's "outside enemy"), the group remained relatively calm in the eye of the storm, having been well-prepared by the project manager.
2) *Conflicting goals of group members:* members may not be aware of their motives. Even genuinely work-oriented members may be too self-oriented or competitive. Destructive conflict was avoided by constant perception checking. Group members held frequent and frank discussions about their reasons, both personal and career-based, for needing the project to be a success. Having these goals created interdependence.
3) *Failure to communicate and utilize information:* participation is never completely equal. Group members may fail to participate fully for any number of reasons: when this happened the group became very maintenance-oriented until the miscommunication was resolved.
   The life of the project had its natural rhythms that the group consciously attended to and discussed. Awareness of individual members' external career commitments and pressures was critical. When a member was unable to participate fully, the group made a conscious decision to accept it or to change a task's timeline.
4) *Egocentrism of group members:* effective decision-making depends on the ability to take other perspectives. Groups in which members are

committed to their own paint of view and evaluate all information on that basis make low-quality decisions. Involvement in a design project of this nature in the Faculty is increasingly seen as a privilege: team members approach the task determined to contribute to its success. For example, because of the release-time designated for team members to participate in this project, there was a high degree of sustained accountability to see this project through to a successful conclusion. The accountability was internally applied by group members with each other, as well as externally applied by group members' supervisors.

5) *Concurrence seeking and premature closure within the group:* occurs when group members inhibit discussions in order to avoid conflict and disagreements. The team chose negotiation over compromise at all design and production stages.

This point cannot be overemphasized. Group members did not operate on a model of compromise: compromise was seen to achieve the lowest common standard. Instead, negotiation through lively and often time-consuming discussion was determined to be the better model.

6) *Lack of sufficient heterogenity:* the more homogeneous the group, the leas each member contributes in the way of information, skills and viewpoints. Inter-institutional collaboration is a major advantage in this regard, although all team members possessed teaching backgrounds, which helped.

Johnson, Johnson, and Holubec (1986) suggest that the more sophisticated the material, the smaller the group size should be, and the more heterogenous the group should be.

The heterogeneity of expertise and professional experiences enhanced the fresh approach of the group. Group members were genuinely interested in each other as professionals from the outset. Individually, group members recognised early that the project would be a valuable professional development opportunity for all concerned: characterised by Kanter (1989) as the "individual potency" achieved through involvement in "newstream" work.

7) *Inappropriate group size:* groups of eight or more tend to be ineffective. But, decision-making groups need to be large enough so that needed resources and diversity of opinion and experience are optimised. Four core team members seemed to be an ideal size in this project.

Interestingly, the major crises that developed during the project all occurred when the core group needed to expand for external resources. Bringing in more people caused temporary dysfunction at times, possibly because the knowledge, skills and attitudes of others seemed misaligned with the vision of the group.

8) *Power differences and distrust:* power structures can be so well-understood by all group members that a critical insight or piece of information from a low-power member is ignored. Although the graduate student "intern" initially and deliberately took a low-power profile, an

atmosphere of trust and honesty enabled other team members to insist that he contribute his unique skills on an equal basis.

Indeed, somemembers preferred a lower profile at various times in the project. When it was perceived as occurring for a good mason, this was allowed. During classroom videotaping for example, one group member frequently was absent because he did not feel that he could contribute a great deal to that process. Because his expertise was not required on site, this was not problematic. On the other hand, the aforementioned graduate student who began the project downplaying his considerable creativity and acumen, was not allowed to continue this stance for long.

COLLABORATIVE PRINCIPLES

A number of generic collaborative principles described by Idol, Paolucci-Whitcomb & Nevin (1986) closely parallel the instructional design approach adopted by the Instructional Technology Centre:

Collaboration requires team ownership of the identified problem.

Within the core team all members must share accountability for the success or failure of the project. Effective team performance depends an the ability and willingness of each person to express opinions, to share perspectives, to encourage contributions from all team members, and to work towards a team consensus. Recognition and appreciation of each person's expertise is essential.

Although the design project had not yet been officially established, the core team of two content experts, one from each institution, and the project manager/instructional designer met several times over the preceding summer to discuss possible team focus and roles. A consensus model was adopted early in which all team members would be responsible for all aspects of the process. In this way, an informal (and later, formal) commitment was achieved to share and blend skills and knowledge in both design and content areas.

Each design effort undertaken by the Instructional Technology Centre involves a team approach. Convinced of the importance of this approach by experience, a structure was organized whereby each core design team includes a faculty member/sponsor, an instructional designer, and a project manager, who may also be the designer. Each team is a subset of a larger group of stakeholders: faculty members, Department Chairs, and course instructon. From time to time the core team "reports" progress to the stakeholders in an effort to involve them on one level of decision-making. In this way, each project depends on and includes feedback from those who will eventually use the product in their teaching. In this project, the core team sought input on several occasions from appropriate faculty members, board consultants, and

administrators.

Implementing change involves recognition of individual differences in developmental progress.

Naidu (1988) suggests that participation in a collaborative design project is a new experience, or innovation, for most team members that requires changes through multiple levels or stages of planning, learning new behaviours, and adapting to new routines. Since change is such a personal experience, all team members must be sensitive to the wide range of individual differences in feelings, opinions, readiness, etc.

It is the contention of the Instructional Technology Centre that the project manager, who is also one of the instructional designers, should be familiar with and attentive to the process of developmental change as a design issue. The developmental change model developed by Hall and Loucks (1978) at the Univenity of Texas is representative of other innovation-adoption models in describing seven individual "stages of concern": team members are ready to expedite instructional design goals at the stage associated with personal impact of the innovation (videodisc).

In this project the core design team was enriched by the addition of one instructional design "intern" who was a graduate student in the Educational Technology program. The team felt that it was important, although timelines were relatively inflexible, to participate in a number of initial familiarization activities with videodisc technology and vocabulary; and instructional design models, issues, and jargon. Maintaining a personal team journal, a task undertaken by the "intern", enabled team members to share and check perceptions throughout the process: in this way "uneasiness, disillusionment, hostility and withdrawal" (Naidu, 1988) were identified early and resolved before the collaborative process could be undermined.

Group norms must be negotiated at the outset and maintained throughout the collaborative process.

Group members will take ownership of group norms if they have helped identify them, see that the others are willing to accept and follow them, and recognize that they will help accomplish group goals (Johnson, 1980).

Initial group norms were negotiated over coffee in the summer. In pairs, or as a group of three and later four, the team identified initial roles and responsibilities, methods of communication, preferred working styles and sites, boundaries of trust and so on. For example, since the two SME's had not been involved extensively with instructional design teams, the project manager made readings on the subject available, which were discussed at subsequent meetings. After the first few meetings, a consensus model was adopted in which all team members would be responsible for all team activities. As well, since two institutions were involved, it became necessary at the outset to

identify a neutral, convenient meeting ground for the team. Meeting in a private, designated project room on campus was facilitated by arranging free parking passes for the off-campus team member, restricting access to team members and invited guests, providing "desk space" for team members, and personalizing the environment by installing a thermal carafe and personal coffee cups.

Having a personal space also helped define boundaries of trust. Early on it was agreed that any comment made by any team member, whether design-related or personal, would not be repeated outside the room. Since the project was seen as a high-risk professional activity for some individuals, the privacy and loyalty of the team to each member was pivotal in establishing an atmosphere of openness and creativity.

Situational leadership guides the implementation of collaborative consultation.

The leadership process in a collaborative project is defined as an influencing relationship among mutually dependent team members (Johnson & Johnson, 1975). Generally, team roles consist of either task functions, which lead to project goal achievement; or maintenance functions, which include the affective tasks of encouraging, arbitrating disputes, increasing interdependence among members, etc (Thibault & Kelly, 1986).

Although all instructional design projects in the Faculty have a designated leader, or project manager, all team members took responsibility for the project goals and for maintaining positive relationships among team members: both leadership and maintenance functions were thus operationally distributed. For example, content development for the disc was based on a brainstorming approach, culminating in a mind - map which contained all the concepts related to "questioning" it was possible for the group to generate. These brain-storming sessions were led by one of the content experts who had employed this technique during inservice sessions. Advantages of this consensus model include maximizing the unique abilities and perspectives of each participant, effective utilization of technical resources, and ensuring group commitment to the team's decisions.

Cooperative goal structures underlie conflict resolution during the collaborative process.

Within a cooperative framework, the inevitable disagreements and arguments are viewed as positive opportunities for constructive interaction. As participants learn to feel comfortable with controversy and learn specific skills in negotiating, rather than avoiding, design and goal conflicts, the resolution process can improve problem-solving strategies, reduce cognitive egocentrism, stimulate creativity, clarify values, increase group motivation and encourage change (Johnson, 1980; Johnson & Johnson, 1982).

Because this project was, in one sense, an attempt to bridge theoretical and practical differences between programs of teacher preparation and continuing professional development, a significant outcome of constructive controversy was increased perspective-taking between the representatives of the Faculty and Edmonton Public Schools.

Conflict appears to be an unavoidable aspect of group dynamics (Schutz, 1958; Schein, 1969; Srivastva, Overt & Neilsen, 1977; Tuckman & Jensen, 1977; Johnson &Johnson, 1982; Oja & Smulyan, 1989) and this project was no exception. But the most serious threat occurred from a team level outside the core and was a turning point in establishing a quality of group cohesiveness and commitment that endured to the project's completion and beyond.

Attention to communicative quality facilitates meaningful interactions among all group members.

Since it is essential to minimize misunderstandings and distortions so common in interpersonal communications, an effective feedback system has to be developed to ensure that messages are. being accurately received. Techniques include inviting others to talk, requisite to the design process; knowing when to keep quiet; and using non-verbal responses effectively (Gordon, 1980). It is worth noting here that all team members, by virtue of professional education and experience, were highly skilled at interpersonal interactions: all are or had been classroom teachers; all performed consultative roles. Even areas of expertise revealed this interpersonal orientation: the team included experts in drama, modern languages, course coordination, consulting, communication arts; and instructional design.

An important aspect of non-verbal language is the ability to perceive its subtleties. Perception checking is essential because all team members are given the opportunity to deal with the perception: so perception checks are descriptive rather than judgmental. Starting each team meeting by sharing the previous meeting's journal entry was one strategy the group employed successfully in this regard: another was to "stakeout" a project room which was inaccessible to others for the duration of the process. This room was critical in establishing belongingness.

Oral and written communications (should, ideally) rely on commonly understood language.

Although jargon terms are intended to make communication more efficient, to the uninitiated they make the conversation both more exclusive and distancing. This may be particularly true of a design project involving newer technologies such as videodisc.

Since jargon terms were unavoidable, they were taught at the outset to team members in several sessions devoted to orientations to both the technology and relevant instructional design terms. Once again, perception checking

at all design stages was employed to ensure that every one understood and were correctly using the technical and design vocabulary. For example, new terms such as memory (which soon became the "M" word), still frame, freeze frame, data dump, Level I/II/III, CAV/CLV, visual database, SMPTE time code, and so on, soon became familiar working vocabulary.

The collaborative design process tends to progress through a cycle of phases reflecting both personal and task needs.

A number of cyclical models of collaboration have been explicated (Schutz, 1958; Tuckman & Jensen, 197'7; Idol, Paolucci-Whitcomb & Nevin, 1986; Collis & Gore, 1987; Oja & Smulyan, 1989): commonly the group moves through a period of conflict through an interpersonal to a task orientation. Often, the performance- oriented phase leads to a renewal stage allowing the group to reform and refocus, perhaps expanding to admit new members (Oja & Smulyan, 1989). Our team described this process as moving From Initiation to Integration (see Figure 1 on page 200).

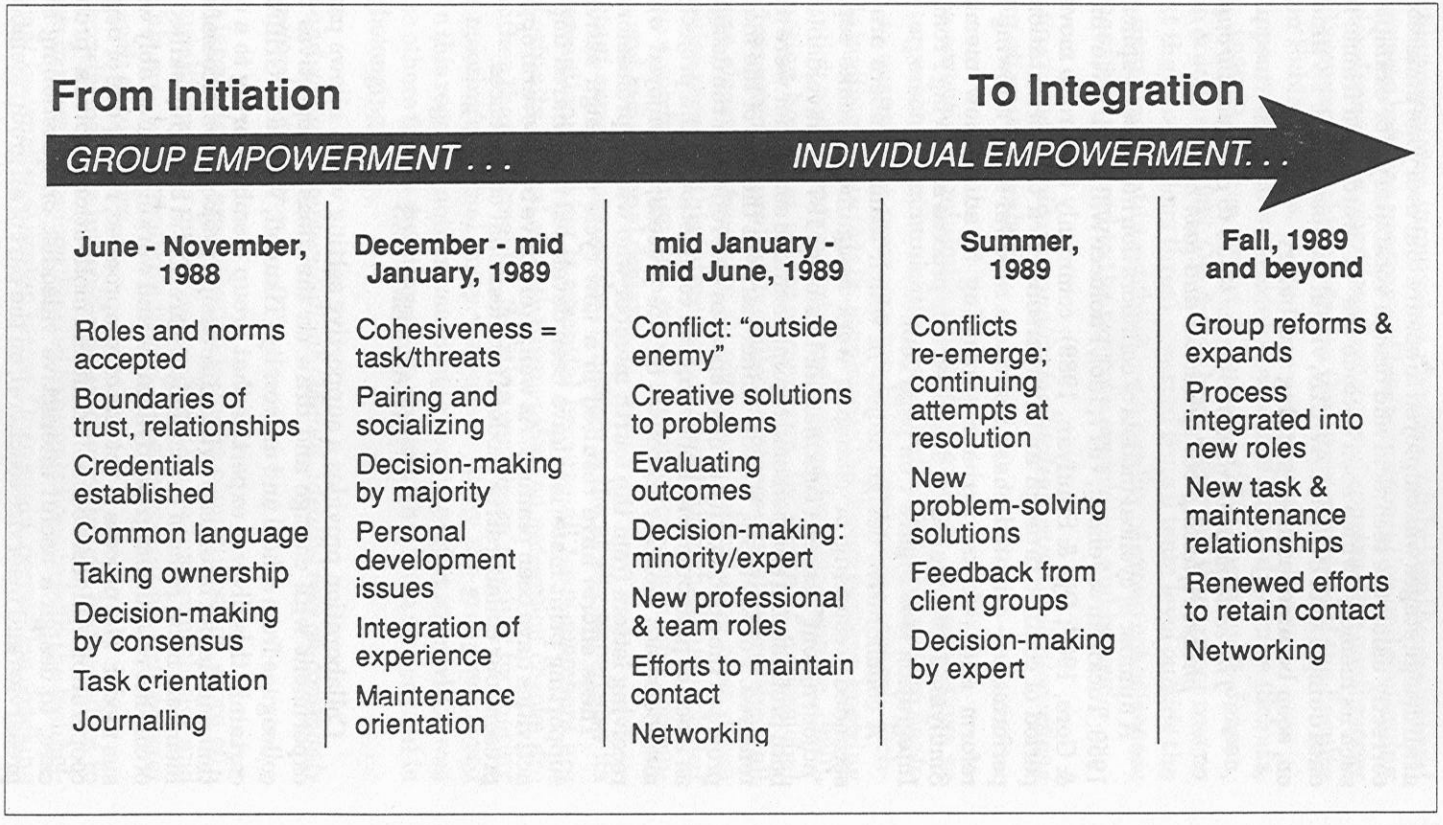
A collaborative design project in which team members are temporarily seconded, resuming or changing work assignments make separation and "adjournment" issues (Tuckman and Jensen, 1977) unavoidable: in our case both professional and personal commitments to each other were maintained or renewed. For example, a team dinner party at the one of the members' home provided the opportunity to meet spouses and reflect on the design experience as a social phenomenon. Following the completion of the project, three team members met monthly to reflect on the process; all enjoyed writing to and receiving letters from the fourth member who was on professional leave.

These efforts have resulted in a new cycle of design activity in which supporting print materials have been developed and shared implementation activities have been planned. As well, there have been several opportunities to present our collaborative model at professional conferences

FINAL REMARKS

Collaboration provides a supportive setting which allows participants to experiment with change and draw on the ideas, perspectives and skills of colleagues from school and university (Tikunoff, Ward and Griffin, 1979). It is certainly this diverse expertise that group members bring to a collaboration that enables an interactive videodisc design project to be successful. The group members must remain consciously aware of and be highly skilled in the areas ofconflict resolution, group dynamics, and working comfortably with a consensus model. The process is not one of compromise; rather one of negotiation and cooperation. A sincere commitment and motivation to solve a "problem" (in this case, to design a useful interactive videodisc on questioning strategies for preservice and inservice teachers), on the part of all group members is critical.

Figure 1.
The Group Development Process.



The time spent on a project of this magnitude will seem onerous only to members forced into a collaborative assignment with which they are uncomfortable, and will inevitably result in a crisis. To a committed team, such as this collaborative team from the University of Alberta and Edmonton Public Schools, the professional development opportunities alone will far outweigh the work load required. Avigilant and supportive team will motivate members to be as creative and positive as they are goal-oriented. The challenge in the process is as great as the reward.

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