

GROWTH IN TEACHERS' CURRICULUM KNOWLEDGE THROUGH THE PROCESS OF CURRICULUM ANALYSIS

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Current efforts to reexamine and reconceptualize teacher education have raised our awareness of teachers' curriculum knowledge base.¹ Until recently, teacher educators perceived curriculum knowledge as self-evident and commonsensical.² Only in the last few years have deliberate plans to include curriculum studies in preservice as well as inservice programs emerged.³ Researchers of teacher education have become increasingly concerned about the difficulties that the historical distinction between curriculum and peda-

¹See, for example, Holmes Group, *Tomorrow's Teachers: A Report of the Holmes Group* (East Lansing: College of Education, Michigan State University, 1986); George J. Posner and Alan N. Rudnitsky, *Course Design: A Guide to Curriculum Development for Teachers*, 3rd ed. (New York: Longman, 1986); Karen Zumwalt, "Beginning Professional Teachers: The Need for a Curricular Vision of Teaching," in *Knowledge Base for the Beginning Teacher*, ed. Maynard C. Reynolds (Oxford, England: Pergamon Press, 1989), pp. 173-184; Yuval Dror, "Is There a Place for a Specific Course in Curriculum Studies in Preservice Education?" (working paper, University of Haifa, Israel, 1989); Marilú Riosco G., "The Use of the Curriculum Conference in Teacher Education: A Chilean Experience," *Journal of Education for Teaching* 15 (No. 1, 1989): 73-74.

²Karen Zumwalt, "Beginning Professional Teachers: The Need for a Curricular Vision of Teaching," in *Knowledge Base for the Beginning Teacher*, ed. Maynard C. Reynolds (Oxford, England: Pergamon Press, 1989), pp. 173-184.

³See, for example, Miriam Ben-Peretz, "Curriculum Theory and Practice in Teacher Education Programs," in *Advances in Teacher Education*, vol. 1, ed. Lilian G. Katz and James D. Rath (Norwood, NJ: Ablex, 1984); Moshe Silberstein and Pinchas Tamir, "Curriculum Development and Implementation as a Component of Teacher Education in Israel," *Teaching and Teacher Education* 2 (No. 3, 1986): 251-261; Moshe Silberstein and Miriam Ben-Peretz, "The Concept of Teacher Autonomy in Curriculum Materials: An Operative Interpretation," *Journal of Curriculum and Supervision* 3 (Fall 1987): 29-44; Naama Sabar, Moshe Silberstein, and Rachel Arbel, *Evaluation of an Inservice Course for Facilitators of Teams of Teachers Developing Curriculum Materials*, Research Report No. 1, Division of Curriculum Research and Development (Tel Aviv, Israel: Tel Aviv University, 1987); Deborah L. Ball and Sharon Feiman-Nemser, "Using Textbooks and Teachers' Guides: A Dilemma for Beginning Teachers and Teacher Educators," *Curriculum Inquiry* 18 (Winter 1988): 401-423.

gogy and the neglect of curriculum as a prominent element in teacher education have caused to teaching.⁴

Although curriculum knowledge is regaining its status as an important component of teachers' pedagogical repertoire, no agreement exists on its scope and nature. Therefore, definitions of the concept vary greatly. For example, Shulman and Sykes define *curriculum knowledge* narrowly as "the understanding of the alternative form of curriculum for [the teacher's] special area and the ways in which those curricula are embodied in different texts and materials."⁵ In comparison, Zumwalt broadly defines beginning teachers' initial knowledge of curriculum as "an understanding of (1) different views of curriculum and ensuing consequences for the role of the teacher, (2) some conception of a curricular planning process and the knowledge necessary to carry it out, (3) the realities of curricular decision making, which include not just the realities of the first year, but an understanding of the enduring nature of many critical curricular issues."⁶

Further, Silberstein differentiates among three levels of teachers' curriculum knowledge:⁷

- At Level 1, the teacher is an *autonomous consumer* who can wisely use ready-made curriculum materials.⁸ This teacher knows how to assess materials, make a deliberate and justified selection among them, and adapt the chosen materials (or segments from them) to the instructional environment and teaching circumstances.
- At Level 2, the teacher is a *consumer-developer* who can develop materials of limited scope to supplement and enrich ready-made materials
- At Level 3, the teacher is an *autonomous developer* who can plan, design, and develop an entire course of study, often in areas with no (or few) existing curriculum materials.

⁴See, for example, T. J. Lovat, "Curriculum Theory: The Oft-Missing Link," *Journal of Education for Teaching* 14 (No. 3, 1988): 205–213; Walter Doyle, "Teachers' Curriculum Knowledge" (paper presented at the annual meeting of the American Educational Research Association, Boston, April 1990); Walter Doyle, "Curriculum and Pedagogy," in *Handbook of Research on Curriculum*, ed. Philip W. Jackson (New York: Macmillan, 1991).

⁵Lee S. Shulman and Gary Sykes, "A National Board for Teaching? In Search of a Bold Standard" (paper prepared for the Task Force on Teaching as a Profession, Carnegie Forum on Education and the Economy, 1986), p. 10.

⁶Karen Zumwalt, "Beginning Professional Teachers: The Need for a Curricular Vision of Teaching," in *Knowledge Base for the Beginning Teacher*, ed. Maynard C. Reynolds (Oxford, England: Pergamon Press, 1989), p. 174.

⁷Moshe Silberstein, "The Teacher's Place in Curriculum Planning in Israel," *Educational Studies* 40 (May 1984): 131–150 (in Hebrew).

⁸*Curriculum materials* are tangible materials used for teaching and learning—commercially produced textbooks, guides, workbooks, films, games, computer software, and audiocassettes—as well as materials developed by the school and individual teachers—handouts, worksheets, and collections of readings. This definition is similar to the ones provided by researchers studying the relationships between teachers and the curriculum materials they use (see notes 15 and 16).

This differentiation helps to highlight the focus of this study. Research on curriculum knowledge is usually geared toward Levels 2 and 3.⁹ The sparse research on Level 1 deals mostly with the neglect of teacher-education programs to cultivate the required understanding and skills for working at this level.¹⁰ Although the lowest in the hierarchy of teachers' curriculum knowledge, Level 1 is crucial because it is a precondition for achieving Levels 2 and 3—the ultimate curricular functions of good teachers. Reaching Level 1 is also a desired goal in and of itself because commercially produced materials, and especially textbooks, are a pervading aspect of school life.¹¹ Because students spend so much time with curriculum materials and teachers rely so heavily on these materials, at the least teachers must become autonomous consumers.¹² Therefore, I examine how teachers operate at Level 1 and how to improve their thinking about curriculum materials.

The approach used in the study is *curriculum analysis*—the systematic and critical examination of curriculum materials that can help identify their positive and negative characteristics, reveal their potential for learning and teaching, and expose their hidden values and implicit assumptions.¹³ The purpose of this examination is to select materials before their use in the classroom, to modify materials already in use, or both. Although the literature on curriculum analysis discusses the important contribution of the process to curriculum decision making, no studies have yet explored the potential of this approach to deliberately develop teachers' curriculum knowledge.¹⁴

⁹See, for example, F. Michael Connelly and Miriam Ben-Peretz, "Teachers' Roles in the Using and Doing of Research and Curriculum Development," *Journal of Curriculum Studies* 12 (April–June 1980): 95–107; Jean H. Young, "Teacher Participation in Curriculum Development: What Status Does It Have?" *Journal of Curriculum and Supervision* 3 (Winter 1988): 109–121; Naama Sabar, Jean Rudduck, and William Reid, eds., *Partnership and Autonomy in School-based Curriculum Development* (Sheffield, England: University of Sheffield, 1987); David S. Martin, Philip S. Saif, and Linda Thiel, "Curriculum Development: Who Is Involved and How?" *Educational Leadership* 44 (December 1986/January 1987): 40–48; F. Michael Connelly and D. Jean Clandinin, *Teachers as Curriculum Planners. Narratives of Experience* (New York: Teachers College Press, and Toronto, Canada: OISE Press, 1988).

¹⁰Miriam Ben-Peretz, Sarah Katz, and Moshe Silberstein, "Curriculum Interpretation and Its Place in Teacher Education Programs," *Interchange* 13 (No. 4, 1982): 47–55; Jean Rudduck, "Curriculum Development and Teacher Research" (paper presented at the International Seminar on School-based Curriculum Development, Shefayim, Israel, December 1984); Jesse Goodman, "Teaching Preservice Teachers a Critical Approach to Curriculum Design: A Descriptive Account," *Curriculum Inquiry* 16 (Summer 1986): 179–201.

¹¹See, for example, Deborah L. Ball and Sharon Feiman-Nemser, "Using Textbooks and Teachers' Guides: A Dilemma for Beginning Teachers and Teacher Educators," *Curriculum Inquiry* 18 (Winter 1988): 401–423; John A. Zahorik, "Teaching Style and Textbooks" (paper presented at the annual meeting of the American Educational Research Association, Boston, April 1990).

¹²Miriam Ben-Peretz, *The Teacher-Curriculum Encounter: Freeing Teachers from the Tyranny of Texts* (Albany: State University of New York Press, 1990).

¹³Tamar Ariav, "Curriculum Analysis and Curriculum Evaluation: A Contrast," *Studies in Educational Evaluation* 12 (No. 2, 1986): 139–147; Tamar Ariav, "Curriculum Analysis," in *The International Encyclopedia of Education, Supplementary Volume 1*, ed. Torsten Husen and T. Neville Postlethwaite (Oxford, England: Pergamon Press, 1989), 194–196.

¹⁴Ibid.

A scheme (an instrument) composed of questions or criteria often guides the analysis process.¹⁵ Schemes vary in their structure, purpose, scope, instructional emphases, curriculum ideology, and educational values. They are strongly related to Level 1 curriculum knowledge, although their proactive application to Levels 2 and 3 can be beneficial as well. Studies describing the use of schemes in teacher education often focus on validating the instruments rather than determining the effects the schemes might have on teachers' curriculum thinking.¹⁶ Data about how schemes affect teachers' curriculum knowledge are incidental and not well documented. Therefore, we know relatively little about how teachers' thinking alters when they become involved in the process of curriculum analysis by applying a scheme to their work.

This study proposes a new scheme, SALTAL, developed in a workshop that I led and directed. Workshop participants were student teachers, practicing teachers, and teacher trainers.¹⁷ We believed that SALTAL is a more appropriate scheme for teachers functioning at Level 1 in the Israeli educational system today than any other scheme available to us. Here SALTAL became the vehicle we used to examine whether individual teachers are autonomous consumers of curriculum materials and how to meliorate their thinking at Level 1.

DESCRIPTION OF THE STUDY

The participants of the curriculum-analysis workshop (in which SALTAL was developed) carried out the fieldwork under my supervision. We approached teachers in schools that we had access to through our educational contacts as student teachers, practicing teachers, and teacher trainers. Of the eleven teachers we asked to take part in the study, eight agreed, but their interest, motivation, and enthusiasm varied largely. In this first encounter, we showed SALTAL to the teachers and generally described the next steps in the process. The three teachers who declined to take part thought that they could not devote the time required.

¹⁵Work in curriculum analysis is sometimes carried out without using schemes, see, for example, Anne Reynolds, Judy Haymore, Cathy Ringstaff, and Pam Grossman, "Teachers and Curricular Materials: Who Is Driving Whom?" (paper presented at the annual meeting of the American Educational Research Association, San Francisco, April 1986), Bonnie B. Armbruster and Thomas H. Anderson, "Producing 'Considerate' Expository Text. Or Easy Reading Is Damned Hard Writing," *Journal of Curriculum Studies* 17 (July–September 1985): 247–274. The focus in this study, however, is on the more common interpretation of curriculum analysis using schemes.

¹⁶See, for example, Michael R. Eraut, Len H. Goad, and George Smith, *The Analysis of Curriculum Materials* (Sussex, England: University of Sussex, 1975), Mirlam Ben Peretz, "Analysis and Comparison of Some High School Biology Curricula in Israel: Theoretical and Practical Considerations in the Process of Curriculum Development" (doctoral dissertation, Hebrew University, 1977); Tamar Ariav, "A Theoretical and Practical Examination of a Comprehensive Model for Curriculum Analysis" (doctoral dissertation, University of Pennsylvania, 1983).

¹⁷Participants in the workshop at Tel Aviv University are acknowledged for their contributions in developing SALTAL and working with the teachers in this study. G. Almog, E. Ashkenazi, Y. Inbar, A. Karinsky, G. Matzliah, M. Mevorah, A. Oster, N. Pri, H. Ravid, T. Shiloni, and D. Wackert-Emanuel.

The work with every teacher differed in schedule and duration but followed the same sequence:

A. The first meeting briefly discussed SALTAL and its application to the analysis of curriculum materials. In the following exchange, the teacher received a copy of SALTAL and gave the researcher a copy of the curriculum material he or she had decided to analyze with the instrument. Before the next meeting, the teacher studied SALTAL, and the researcher examined the curriculum material carefully.

B. During the next working session, the teacher and the researcher together analyzed the curriculum material using SALTAL. This meeting provided an opportunity for a practitioner-researcher dialogue on curriculum issues in general and on curricular decision making in particular. In a way, SALTAL and the analyzed material became a context for discussing curriculum and instruction from both practical and theoretical perspectives. During this session, the researcher had ample opportunities to assess the teacher's curriculum knowledge at the beginning of the process.

C. Next, the teacher independently applied SALTAL to other curriculum materials. Without the researcher's presence, the teacher had to struggle alone with the tool as well as to apply it to a variety of materials. We asked the teachers to document difficulties and problems and to share them and their analyses with the researchers in the next meeting.

D. The researcher then conducted an extensive, semi-structured interview of the teacher. In many cases, the informal interview continued the dialogue in Stage B. The researcher, however, made sure all important questions arose somehow during the interview. Questions dealt mostly with the quality of SALTAL, the influence it might have on teachers' thinking about curriculum materials, the potential importance for teachers who are or wish to become autonomous consumers to use any analysis scheme, and the possible effect of the entire study process on teachers' curriculum work.

All meetings were tape-recorded and transcribed (teachers were not identified by name or school). The teachers' and researchers' field notes, as well as the written analyses, illuminated the recorded data. For each case individually, we summarized the narrative data for Stages A and B. Categories came from the data, some categories overlapped with other cases, and others were genuinely idiosyncratic. We content-analyzed the data for Stages C and D according to predetermined categories—the interview questions. Two researchers independently carried out these analyses and then compared their results.

Because each case study was unique and could have been described in detail by itself, this research focuses on trends common to all or some participants. Therefore, we aggregated, compared, and synthesized the data from the eight cases. Many examples from the various case studies illustrate

the aggregated data. Keeping the meaning intact, we translated all quotations from Hebrew.

The Teachers

Table 1 describes the major characteristics of the teachers in the study. They represent various educational roles and teach different subjects in various grades. Their educational backgrounds are diverse. Their common denominator is a high teaching experience obviously related to their age. All teachers chose to analyze externally developed (i.e., commercial) materials, and five of them also analyzed materials they had developed themselves.

The Instrument

The scheme for curriculum analysis developed for the study, SALTAL, is composed of four sections:

1. An *introduction* explains how the instrument was developed, its philosophical underpinnings, and how to apply it.
2. A *general information sheet* describes factual and contextual characteristics of the analyzed material.

Table 1. Characteristics of the Participating Teachers

Gender	Age	Education	Seniority	Professional work
F	30-40	B.A.	8	Middle school teacher (Bible and literature)
M	40-50	B.A.	18	Elementary school teacher and principal (history and math)
F	20-30	graduate student	5	Elementary school special education teacher (all subjects)
F	40-50	B.A.	8	High school reading specialist (literature, Bible, rehabilitative reading, reading comprehension)
M	40-50	B.A.	25	High school teacher (math and statistics)
M	50-60	doctoral student	27	High school teacher (Bible); head of Bible Studies Department at a teacher-education college
F	50-60	B.A.	20	Instructor at a teacher-education college (art for early childhood)
F	40-50	M.A.	13	High school teacher (social studies); member of the state Social Studies Committee

3. A total of 33 *prescriptive criteria* divided into five categories guide the analysis process. The criteria explicate the desirable characteristics of curriculum materials and are therefore normative and judgmental.

4. A *profile sheet* presents each criterion in abbreviated format with an attached rating scale. The combined points on the 33 scales create a graph—a visual profile of the material under examination.

The instrument is presented in the Appendix. We developed SALTAL in an arduous process of deliberations following a thorough examination of numerous existing schemes for curriculum analysis. (In particular, the TIE scheme has influenced its development.¹⁸) We wanted to design an instrument to avoid the flaws identified in the other schemes, to be adequate for the educational context of Israeli society, and to reflect our vision of ideal curriculum materials.

FINDINGS AND DISCUSSION

The data indicate changes in the teachers' curriculum knowledge throughout the study. These changes are manifested in the teachers' growing understanding of what an analysis process is, of its importance to good instruction, and of their critical and active role in curriculum work. The teachers' improved attitudes toward SALTAL and their need to learn how to apply it also contributed to their growing knowledge.

Three main developmental stages were evident in the process; they seem to correspond to Stages A, B and C, and D. Different levels of anxiety, tension, or hesitancy often characterized the *entrance stage*. In the *opening stage*, the teachers displayed relief and became more open about their lack of familiarity with an analysis process. They began to raise questions about SALTAL and to engage in curriculum discourse extending beyond the instrument and its application. In the *reflection stage*, the teachers openly expressed their thoughts and feelings about the experience. They related SALTAL to their own educational practices in making curriculum decisions and instructional choices. They critically evaluated SALTAL and the process they took part in for the study.

The Entrance Stage

At this stage, the teachers felt threatened and perceived their established practice to be in jeopardy. SALTAL (or any other scheme) seemed to question their instructional ability and accumulated practical wisdom when making curricular decisions and to challenge their general professional expertise. The early childhood teacher said:

¹⁸Richard A. Gibbonney, *Toward Intellectual Excellence (TIE) Some Things to Look for in Schools* (Philadelphia: University of Pennsylvania, 1980).

I have a negative reaction to working with analytic instruments. I've had bad experiences in the past. . . . Instruments make me nervous and uncomfortable; somehow I don't think in structured schemes.

Another teacher explained:

The use of an instrument is superfluous because good teachers can automatically see all the bad and good things in teachers' materials, evaluate them, and decide whether or not they are appropriate. For veteran teachers, it's a "put-down" because their experience has taught them what is good and what is not good.

However, when asked what criteria he would consider in such an evaluation, he responded hesitantly, and his answer included only few, general, and sporadic characteristics that are commonsensical indeed but provide limited guidance for teachers at Level 1:

. . . the content . . . the questions . . . the level of the material . . . if it is appropriate for the student . . . if it includes what the student needs for the matriculation exam and his future life.

Teachers who needed an instrument to help them evaluate curriculum materials and recommend which ones to select for the next school year were more motivated in the beginning of the study than those who did not have an immediate agenda for application. Also, the three teachers with graduate coursework were more assured of themselves in the beginning, perhaps because of their familiarity with SALTAL's terminology and with curriculum research.

The relative speed with which most teachers read SALTAL the first time reflects the attitude of mixed curiosity and anxiety. Except for one teacher, who read it carefully and prepared a list of questions to raise in the next meeting, all other teachers said they took only 10 to 15 minutes to read and understand the seven-page document. This reaction might suggest that anxiety or frustration was indeed high among the teachers at the entrance stage.

The Opening Stage

Once the teachers started to apply SALTAL in the working session, they entered another stage. To apply SALTAL, they needed to clarify the criteria and understand possible manifestations in the analyzed materials. The teacher and researcher together accomplished the task through discussion, arguments advocating or opposing criteria, and inquiry into the materials to find evidence to support their judgment. Somewhere in these conferences, the teachers' attitudes began to change; their initial resistance was replaced with relief, and their so-called understanding of SALTAL transformed itself into explicit admission that much of what it says is new, intriguing, or unclear. The teacher-researcher dialogues facilitated a curriculum discourse in which the teachers could bring to bear their own practical curriculum wisdom as well as begin to ask questions about it.

Some teachers frankly said they did not understand the curricular meaning of such terms as *autonomous teacher*, *active learning*, *emotional readiness*, *cultural bias*, and *social relevance*. This admission does not imply that they had not heard these educational slogans before but that they could not relate the terms to their own work with curriculum materials in the process of analysis. The responsibility associated with these concepts seemed overwhelming to some, one teacher asked. "Is the teacher expected to know all stages of the learner's cognitive, emotional, and social development? Should he know this for every student? This isn't realistic."

At the opening stage, most teachers were unfamiliar with the term *structure of the discipline*, or they encountered difficulties in understanding the criterion related to this concept. "Principles of the discipline are not objective; they depend on one's worldview. Is teaching literature the teaching of values or art?" The documented researcher-teacher dialogues following this comment focused on the importance of the personal, idiosyncratic facet of the concept but also clarified its meaning through the interpretations given by Bruner and Schwab. Thus, the criteria in SALTAL were a springboard for further inquiry into curricular issues that extended beyond the immediacy of the analysis task.

Some teachers claimed that particular criteria do not apply to their subjects. The math teacher criticized all affective criteria, asking, "What moral and educational approaches can be dealt with through logarithmic equations?" The special education teacher thought that "the entire 'content' category is irrelevant for special education because in special education we emphasize process, competencies, and skills, and the content is marginal; it is only a vehicle." The reading specialist believed that the criteria under the "thinking and experience" category were not important in her teaching. Other statements were more alarming. "Tying past and present experiences is an important criterion for the study of sociology but not of economics"; "The criterion encouraging the teacher to act autonomously is a theoretical requirement with no practical value."

These comments reflect beliefs teachers hold about their professional world and especially about their curricular views. They indicate a lack of knowledge and understanding of curriculum terms, concepts, and ideas. They are lucid examples of an insular outlook at subject matter, its relations to other subjects, the construction of knowledge, and the mutuality between content and method. The comments also reveal a certain degree of apathy or disappointment over the teacher's role in curriculum work. These comments came during dialogues with curriculum-specialist partners, however, and so the curriculum-analysis process became an effective means to expose preconceptions and initiate a professional self-inquiry.

The teachers' independent applications of SALTAL, which followed the working sessions, played a major role in helping them to come to grips with the instrument and to think about curriculum analysis from a new, more

knowledgeable perspective. This development was evident in the interviews when teachers reflected retrospectively on the entire process and especially on their independent applications of SALTAL.

The Reflection Stage

At this stage, the teachers raised questions about the process, drew personal and general conclusions, and suggested how to restructure SALTAL in a way that would be more useful to them. Is it possible for any curriculum material to be so perfect as to score high on all the SALTAL criteria? Should teachers engage in subjectively interpreting the hidden dimensions of the material, or should they limit the analysis only to the overt and explicit? Is it feasible for a teacher to use the scheme without proper training? Does implementing a normative and structured tool support or contradict the notion of an autonomous teacher? These questions struck the teachers mainly while they were working independently, struggling with the process by themselves.

Important conclusions ranged from heightened awareness of the role of systematic curriculum analysis in the process of material selection to a deliberate insight that the SALTAL criteria are, in effect, guidelines for curriculum development (i.e., transition from Level 1 to Levels 2 and 3 curriculum knowledge). One teacher said:

If I were working in curriculum development, this [analysis] would have helped me create a curriculum bank. . . . A curriculum material should not be taken for granted

Another teacher found the process helpful in organizing her thoughts:

I realize more clearly the bases for my intuition. . . . I sort of proved to myself what I felt but couldn't articulate for myself. . . . Now I have to justify, I know to say more cleverly and orderly *why*. . . . If I had to defend or criticize the curriculum material, it would be much easier now. . . . [SALTAL] would be good for curriculum development and for curriculum discussions with teams of teachers.

The interviewed teachers were asked to express their opinions about SALTAL. The range of critical comments was overwhelming. They identified various weaknesses: vague terminology, lack of differentiation between criteria for students' materials versus the teacher's materials, and the limitation of the rating scales as a static product of the analysis. They suggested eliminating criteria (e.g., A2), combining criteria (e.g., B6 and B7), adding missing criteria (e.g., the cost of the materials and the values reflected in the content) (See the Appendix, Section 3, for a list of all criteria.) They proposed modifying the rating scales from 3 points to 5 points and rewriting the introductory part in more detail and in simpler language.

Criticism about the instrument often preceded or followed positive and even enthusiastic comments:

● SALTAL is idealistic. . . . It is also comprehensive and helps expose what exists in the materials and defines it. . . . It provides a basic evaluation and allows one to make a grounded selection.

● SALTAL clarified to me that the curriculum I use is better than I thought it was . . . I find the instrument important especially for special education, where everyone chooses materials indiscriminantly, with no criticism.

● As a science person, I recognize the importance of an instrument whose approach is logical analysis, with categories and criteria, which enables me to examine curriculums from all sides. . . . It is hard to conceive of a curriculum that will indeed include all these positive and desirable points. . . . If we will focus on all these points, we will be able to create a curriculum that is almost perfect. In other words, I maintain that the instrument is good for curriculum development . . . but it could even be helpful on a daily basis for preparing lesson plans.

● A logical organization of the analytic process calls for a complete and comprehensive analysis. . . . SALTAL is not a simple tool; it requires thoughtful reading. . . . It allows one to see many points of view. In addition, many of these [points of view] were new to me. . . . It surely makes one examine the curriculum carefully.

Both the negative and positive comments about SALTAL reveal the teachers' substantial growth in curriculum knowledge. A prerequisite of reflective thinking and concrete evaluative recommendations is understanding the criteria through personal experience and internalizing the criteria through the creation of personal meaning. SALTAL as a vehicle stimulated the teachers to question routine practices, heightened their awareness of professional obligations, opened new and fresh angles for looking at curriculum work, increased their insight into the interrelationship between curriculum and teaching, and helped some teachers begin a transition toward Level 2 curriculum knowledge. The process of curriculum analysis in general, and SALTAL in particular, was therefore successful in enhancing curriculum knowledge at Level 1 and might have also spurred some teachers to higher levels of curriculum knowledge.

The case of N. illustrates perhaps the most significant change in curriculum knowledge. Although interested in the instrument and the process involved, N. had an initial strong objection to "quantify issues in language arts curriculums." He also had reservations about the stages of the study and especially about the working session:

When you brought the instrument and explained it, that was already a drawback; it meant that SALTAL is not clear enough . . . and then it is not helpful to me.

Yet in the interview, he said:

Throughout the work, many [curricular] concepts and the entire essence of SALTAL, its goals . . . became clear. . . . Through SALTAL, I learned about the potential of the curriculum. By potential, I mean what exists in it implicitly and in a hidden way. The instrument you offered me can help me structure my own instrument, build on this one, but one that will be mine. . . . The instrument must be owned by an individual, like everything else.

CONCLUSION

Despite its importance, the lowest level of desirable curriculum knowledge, Level 1, is still above the common operational level of even experienced teachers. In the beginning of the study, most teachers thought they were already functioning as autonomous consumers of curriculum materials, but actually they had not yet reached that level. Although some were more advanced than others on the lower end of Level 1, none of the teachers demonstrated a thorough, profound understanding of the curricular dimension of their work. They relied strongly on intuition, and their criteria for evaluating curriculum materials were unarticulated and unclear. As much as intuition and heuristics are important for decision making, they are not sufficient for making sound judgments. (Research on teachers' judgment indicates a need to train teachers to become more aware of the nature of their critical assessment and to improve their ability and skills in making judgments¹⁹)

The stages of the study created a sequence of experiences that enabled the teachers to move up from pre-Level 1 or lower Level 1 curriculum knowledge, some teachers even forged toward Level 2. This change occurred as the teachers recognized the value of systematic and deliberate thinking in their curriculum work, which does not necessarily undermine their intuitive assessments but, on the contrary, complements more spontaneous judgment.

Curriculum analysis fulfilled our expectation of being a useful, effective procedure for examining how teachers operate at Level 1 and how to improve their thinking about curriculum materials. Moreover, it was an impetus for much more self-reflection and self-scrutiny about instructional praxis than anticipated. The pragmatic nature of the process and its broad boundaries seem to appeal to practitioners and to invite them to apply it. They can do it alone or with colleagues, at home or in school, before or while using curriculum materials, with any scheme they prefer (ready-made or their own). Additional studies should explore alternative approaches to introducing curriculum analysis to teachers in more lucrative, supportive ways than those used here.

SALTAL, as a scheme for curriculum analysis, seemed both to contribute to the change process and to benefit from it. The backbone of the curriculum-analysis process, this instrument helped identify what and how much teachers know about curriculum selection and implementation, how they feel about their pedagogical expertise, what they think of their professional obligations, how they see the connection between curriculum and instruction, and what specific and general principles they could learn from its application. Because we cannot view SALTAL independently from the researcher-teacher interac-

¹⁹Richard J. Shavelson, "Teachers' judgments," in *The International Encyclopedia of Teaching and Teacher Education*, ed. Michael J. Dunkin (New York: Pergamon Press, 1987), Robert D. Hoge and Theodore Coladarci, "Teacher based Judgment of Academic Achievements: A Review of Literature," *Review of Educational Research* 59 (Fall 1989): 297-313.

tions, assessing its incremental contribution to the entire growth process is difficult. But SALTAL clearly played a crucial role; without it, the teachers could not have carried out the analysis process. Therefore, repeating the study with different schemes for curriculum analysis might determine what effect a particular instrument has on the pattern and quality of growth in teachers' curriculum knowledge.

The version of SALTAL used here was experimental and tentative. We had no idea how teachers would react to it, its strengths and weaknesses, and whether it has the potential to be a diagnostic and an improvement tool. In a way, through the study we indirectly pilot-tested SALTAL. The teachers' variety of suggestions, recommendations, corrections, and comments are valuable aids for revising SALTAL. We must consider their feedback when we rewrite and modify the instrument for further use.

The teacher-researcher interactions were another pivotal component of the growth process. All eight teachers believed the give-and-take element was essential, and two of them suggested extending the teacher-researcher communication time to allow for additional experiences together. One teacher said:

An average teacher, without the required background, will not be able to face the instrument. . . . Without your guidance—a structured, professional, and thorough guidance—I would probably not have arrived at a meaningful analysis.

The researcher-facilitators adapted themselves to the teachers' pace, emphases, and interests while keeping in mind the study's general framework. This flexibility helped build rapport and create a positive climate for dialogue but still shaped each case study uniquely. A comparative study where the same researcher works with a number of teachers or teams of researchers and teachers work together are just a few possibilities for reexamining the issue.

This three-step change process resembles Lewin's model for change in any system. (1) an initial dissonance that triggers a questioning of actions and principles usually taken for granted, (2) a series of concrete experiences that establishes readiness and openness to a new idea, and (3) an opportunity for reflection that helps internalize some aspects of the experience.²⁰ (The special importance of the last segment is also proposed by others.²¹) Because the basic design of this study appears congruent with the more general model, I suggest that similar studies follow the same research structure.

The change evident in the study is based on the actual applications of the instrument and extensive verbal discourse. A follow-up study should examine how the participating teachers use their newly acquired knowledge in their classrooms and professional development. Do they make more sophisticated

²⁰Kurt Lewin, "Frontiers in Group Dynamics," *Human Relations* 1 (No. 1, 1947): 5-41

²¹Philip W. Jackson, "Old Dogs and New Tricks. Observations on the Continuing Education of Teachers," in *Improving In-service Education: Proposals and Procedures for Change*, ed. Louis J. Rubin (Boston: Allyn & Bacon, 1971).

and better articulated curriculum decisions? Are they using SALTAL or any other scheme for curriculum analysis? Do they share with colleagues what they learned? Are they interested in broadening their curriculum knowledge through additional inservice programs or formal studies toward a degree? Do they feel more secure discussing curricular problems with their supervisors? Answers to these questions might shed light on the lasting effect of the experience on the teachers' thinking, interest, attitude, and action.

Much of what we assume to be conventional wisdom of teachers vis-à-vis curriculum is actually absent or partial. Most teachers in the study had no familiarity with curriculum terminology, history, and theory, nor with such curricular practices as how to compare similar materials and what to look for when evaluating materials. This deficiency is especially disturbing when teachers develop their own materials (Levels 2 or 3 curriculum knowledge). Therefore, student teachers must take curriculum courses, and inservice programs must offer various theoretical perspectives and experiential opportunities in curriculum work. Curriculum analysis is one effective avenue for improving teachers' curriculum knowledge base.

Appendix

SALTAL: A SCHEME FOR CURRICULUM ANALYSIS

SECTION 1: INTRODUCTION

Dear Teacher,

The enclosed scheme is a conceptual and practical framework for examining curriculum materials for teachers and students. This scheme was developed in a workshop on curriculum analysis whose participants were all practitioners. In the workshop, we acquainted ourselves with numerous existing schemes for curriculum analysis to guide us in the development of SALTAL. The examination of other schemes helped us crystallize our own worldview about how the scheme should be structured and what its important criteria should be. SALTAL is a judgmental instrument that represents our normative decisions and subjective preferences.

SALTAL reflects a holistic educational perspective and emphasizes the dynamic and evolving nature of the teaching-learning process. It relates to the student as an active and involved learner and therefore appreciates both the outcomes and the processes to achieve them. The focus on process implies an examination of the learner's experiences across time, his cognitive and affective readiness, and the level of his thinking skills. The application of diversified teaching strategies is very important for the achievement of goals adequate for the cognitive-emotional-social development of the students. The teacher, therefore, has a significant influence on the process and product of learning. The autonomous teacher is, in fact, regarded as a learner himself.

Content selected for studying should reflect the structure of the discipline, include updated and important subjects, have some relation to other subject matters, relate to the child's world, and enrich it. Desirable content characteristics are independent of a particular subject matter, but you might find it necessary to add specific ones that are unique to your subject.

SALTAL also emphasizes the structure and organization of curriculum materials so that they are easy to implement, readable, and aesthetic.

The scheme has four goals:

- Assist the teacher in making deliberate selections among materials.
- Improve curriculum implementation by increasing the teacher's awareness of desired characteristics of a curriculum.
- Give the teacher guidelines for developing materials.
- Serve as a basis for dialogue and deliberations among teachers and thereby promote professional growth.

The structure of the scheme is designed for easy application and has three components:

- A descriptive page asks you to gather general information about the material you intend to analyze.
- A total of 33 prescriptive criteria are organized in five categories. Each criterion describes a desirable characteristic that should be found in every curriculum material. The criteria are not arranged according to priority or importance.
- The profile sheet on which you write your analysis presents every criterion in a concise version next to a 3-point scale. By marking each scale and then combining all the marks, you will create a graph that provides a visual representation of the analyzed material. The closer the graph to the right side, the better the material. If you plan to choose among competing materials, you can draw the various graphs on the same profile sheet. If you intend to implement the analyzed material, then pay special attention to the areas that received low marks.

The following are procedural recommendations:

- The analysis should be done on all the components of the curriculum material (e.g., teacher's guide, textbook, students' workbook, ancillary cards)
- When materials are excessively long, it is advisable to sample corresponding segments from all components.
- If a teacher's guide is not available, then the criteria under the "instructional method" category cannot be applied.
- Look for explicit evidence to support your judgment. However, many characteristics will emerge from the close examination that are implicit. Both the overt and hidden characteristics are important and should be considered.

We would appreciate your reaction to this formative version of SALTAL. Thank you.

SECTION 2: GENERAL INFORMATION ABOUT THE ANALYZED MATERIAL

Title: _____

Author(s): _____

Year of publication: _____

Components (*please check*):

- _____ teacher's guide
- _____ students' guide or workbook
- _____ textbook
- _____ guidelines by Ministry of Education

- _____ computer software
 _____ audiovisual components (slides, videotapes, etc.)
 _____ instructional aids (cards, etc.)
 _____ other (*specify*) _____

The material is (*please check*):

- _____ the only material available on this subject for this grade
 _____ supplementary or complementary to other materials
 _____ new substitute to currently available materials
 _____ other (*specify*) _____

The material is targeted for:

- type of school _____
 grade/age _____
 learners' characteristics _____

Does the material specify prerequisites for the teacher (e.g., familiarity with certain instructional techniques, ability to team-teach, new content)? _____

Does the material specify prerequisites for the student (e.g., knowledge of previous content, certain skills, ability to work in small groups)? _____

Are special conditions required for implementation (e.g., physical environment, budget, equipment)? _____

Are any recommendations provided for integrating the material throughout the school year or across grades? _____

Miscellaneous descriptive comments _____

Name of analyst _____ Date _____

SECTION 3: CATEGORIES AND CRITERIA FOR ANALYSIS

A. Rationale and goals

1. The rationale and goals correspond to the curriculum guidelines of the Ministry of Education.
2. The rationale informs the teacher of the author's deliberations about major decisions and the principles underlying the development process.
3. The goals are consistent and do not contradict one another.
4. The goals relate to both the products and processes of learning.
5. Additional goals (beyond those explicitly stated) can be derived by the teacher.

B. Content

1. The content represents central and basic principles of the structure of the discipline.
2. The content includes important themes and areas of the subject matter.
3. The content is scientifically updated.
4. The content goes beyond the particular subject matter by referring to other subject matters.
5. The content corresponds to the goals.

6. The content is responsive to the life of the student as an individual (personal relevance).
7. The content is responsive to the life of the student as a member of society (social relevance).
8. The content legitimates a diversity of opinions and attitudes.
9. The content is free of political, racial, sexual, cultural, nationalistic, or religious biases.

C. Structure and organization

1. Structure is logical and sequential.
2. Organization allows for flexible adaptation to various needs and circumstances
3. The material is legible and well written.
4. Graphic design and technical features are appropriate.
5. It is convenient and easy to use the material.
6. Structure and organization encourage collaboration with others within and outside the school.

D. Instructional methods

1. There is instructional guidance for selecting and applying teaching strategies
2. The instructional methods correspond to the goals.
3. The teacher is encouraged to make autonomous instructional decisions.
4. The instructional methods promote participatory learning.
5. The instructional approaches help the students foresee the purpose of what they do.
6. There are various suggestions for evaluating students' learning.

E. Thinking and experience

1. The student is perceived as an active and involved learner.
2. The student has opportunities for solving practical and meaningful problems
3. Activities require high-level thinking.
4. There is a variety and diversity of learning activities.
5. The activities help connect the student's past and present experiences.
6. There is a consideration of the student's emotional and affective development
7. There is a consideration of the student's cognitive readiness.

SECTION 4: PROFILE WORKING SHEET

Category	1 not at all	2 some- times	3 often, usually
<i>A. Rationale and goals</i>			
1. Correspondence to state guidelines			
2. Author's deliberations			
3. Consistent goals			
4. Balanced process and product			
5. Additional goals			
<i>B. Content</i>			
1. Central principles			
2. Important themes			

3. Up-to-date			
4. Other subject matters			
5. Correspondence to goals			
6. Personal relevance			
7. Social relevance			
8. Diversified opinions and attitudes			
9. Free of biases			
<i>C. Structure and organization</i>			
1. Logical and sequential			
2. Flexibility			
3. Legibility			
4. Technically appropriate			
5. Ease of use			
6. Collaborations with others			
<i>D. Instructional methods</i>			
1. Instructional guidelines			
2. Correspondence to goals			
3. Autonomous teacher			
4. Participatory learning			
5. Foresight of action			
6. Evaluation suggestions			
<i>E. Thinking and experience</i>			
1. Active learner			
2. Problem solving			
3. High-level thinking			
4. Diversified activities			
5. Past and present experiences			
6. Emotional development			
7. Cognitive readiness			

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