HOLISTIC AND REDUCTIONIST APPROACHES IN SPECIAL EDUCATION: CONFLICTS AND COMMON GROUND

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ABSTRACT. Theorists and practitioners in special education have, for some time, been debating the suitability of the holistic (or process-oriented) approach to education for students with special needs. This paper explores the nature of the conflicts that arise between the holistic and reductionistic approaches to education and how these approaches influence educational practice. While these two approaches exist, for the most part, in opposition, there are some areas in which they could be complementary.

RÉSUMÉ. Les théoriciens et les practiciens de l'éducation spécialisée s'affrontent depuis quelque temps sur la question de la pertinence de l'approche holistique (ou axée sur les processus) de l'éducation dans le cas des élèves présentant des besoins particuliers. Cet article examine la nature des conflits qui séparent les approches holistique et réductionniste de l'éducation et les effets de ces approches sur la pratique de l'enseignement. Bien qu'elles s'opposent en grande partie, ces deux approches pourraient être complémentaires sous certains rapports.

There has been considerable debate in the literature over the holistic and the reductionist concepts of education (Dudley-Marling, 1986; Edelsky, 1990; Gage, 1989; Guba, 1990; Heshusius, 1989; McKenna, Robinson, & Miller, 1990a, 1990b; Valencia & Pearson, 1987). This debate has become increasingly significant in the field of special education, particularly in the area of learning disabilities. With the movement away from special class placement and towards mainstream integration, most students considered to be learning disabled take classes with their peers and receive additional assistance through resource programs. If mainstream education is operating from a more holistic framework while special educators are operating from a reductionistic framework, there will surely be confusion for students and teachers, since the aims and methods of the two frameworks differ.

To understand the significance of the difference between the two frameworks it is necessary to consider some of the foundational aspects of the two approaches. In a reductionist framework the intent of the educational process is to pass on, or to transfer, what is known by the teacher to the student. This model is based on reductionist assumptions that knowledge is made up of elementary units of experience which are grouped, related, and generalized, and that the parts of a given learning experience are equal to the whole. In this model, which units are to be taught and in what sequence they will be presented is determined by the teacher or a curriculum specialist.

In the holistic or constructivist approach, there is a change in focus from the concept of *transmitting* knowledge to the active involvement in *creating* or *constructing* knowledge. Knowledge is thought to be formed through a process of transformation (Piaget, 1970): old knowledge is changed in the process of developing new understandings. This clearly differs from the concept that learning is an additive process. As Fosnot (1989) describes it, "learners, in an attempt to make sense of new information and experiences, transform and organize in relation to their own meaning bases" (p.2).

In the constructivist model, learning is *not* seen as an accumulation of facts and associations. Rather, there exists an idea of the whole being greater than the sum of its parts when it comes to the understanding of children's learning. Since children take in information and integrate it with their own experiences, one cannot assume that the child has given the same meaning to the information as the teacher might have intended. Nor is the way the child might integrate the new information always predictable; often the information may not be integrated at all. Of course, the more one knows about a child and each one's experiences, the more one is able to judge whether the information would, in fact, be relevant to the child. This has implications for the transmission model of education, which operates from a set curriculum, wherein students are expected to learn the prescribed information and be able to demonstrate their knowledge through examination procedures which allow little room for different understandings of the material presented, or of the surrounding world.

Theorists and practitioners in special education have been debating the suitability of the holistic or constructivist approach to the field (Aldeman, 1989; Forness, 1988; Heshusius, 1986, 1989; Iano, 1986, 1989; Kimball & Heron, 1988; Licht & Torgesen, 1989; Poplin, 1984a, 1984b, 1988a, 1988b; Reid, 1988). The discussions have remained

rather polarized with each side claiming that the other is misinterpreting their work (Edelsky, 1990; Heshusius, 1989; Kimball & Heron, 1988; McKenna, Robinson, & Miller 1990; Pressley, Harris, & Marks, 1992).

The holistic movement in special education, which has primarily been studied by Heshusius (1982,1986,1989), Poplin (1984a, 1984b, 1988a, 1988b, 1992), Rhodes and Dudley-Marling (1988), and Iano (1986), represents a reaction to the perceived problems within the reductionist special education model. These educators feel that problems in the field have not been, and cannot be effectively addressed within the reductionist framework, their main reason being that it does not reflect the way in which learning occurs.

If we look at the literature regarding the debate between the reductionist and the holistic approaches, we have one side (the holistic) that claims almost no similarities between the approaches, while the other side (reductionist) points out considerable similarity. This is in part due to the differences in the understanding of concepts that occur when one has two frameworks whose foundations and discourse are so fundamentally different (Edelsky, 1990). For example, "student involvement" in the reductionist paradigm means to involve students primarily through specific motivation strategies (Deshler & Schumaker, 1988), while the holistic notion centres around the idea that students have more direct control over the curriculum and the educational processes in general. There are numerous examples where communication between the two groups breaks down due to a misunderstanding of respective terminologies.

This is, perhaps, what has made it difficult for those in the reductionist framework to understand the criticism leveled at them by the holistic proponents. Pressley, Harris, and Marks (1992) argue that the cognitive strategies approach incorporates the key concepts of the holistic approach as outlined by Poplin (1988b). Repeatedly, due to differences in understanding of concepts, these claims do not effectively deal with the differences as seen by the holistic observers. (It is interesting to note here Kuhn's [1970] observations, that is, that in the early stages of a shift, theorists try to incorporate anomalies into their existing models.)

At the present time, most reductionists respond to the holistic approach by denying that the differences described by the holistic educators are valid (Isaacson, 1989; Kimball & Heron, 1988; Pressley, Harris, & Marks, 1992). Meanwhile, the holistic educators continue to argue that the reductionist notion of an educational process is the antithesis

of the holistic perspective. If we look more closely at the beliefs held within the two models, these differences become apparent.

HOW ARE THE REDUCTIONIST AND HOLISTIC CONCEPTS OF EDUCATION IN CONFLICT?

Relationship of parts to whole

The reductionists see knowledge as discrete, identifiable, objective, and impersonal (Allen, 1991), and learning as being static and additive in nature. This suggests that learning can be broken into **elements** which are sequential in nature, and that these parts, when learned, will be equal to the whole. In special education this has led to practices such as task analysis and specific skill training. Even the Individual Education Plan (IEP) which has been the mainstay of programming in special education depends on this notion of learning. (The IEP is a widely used written plan whose purpose is to set goals and objectives for each student.) The IEP is based on the idea that students' behaviour is observable, measurable, and verifiable (Gloeckler & Simpson, 1988). Holistic educators are concerned that many complex and valuable goals are excluded from the IEPs. Or, if they are included, they have been reduced to a point where they have lost their meaning (Heshusius, 1982) due to the fragmenting process by which they have been measured.

By contrast, the holistic educators redefine the act of learning "from a static one emphasizing the acquisition of new pieces of already 'known' knowledge to the act of creating or constructing new meanings" (Poplin, 1991). They see the learner as transforming new experiences into knowledge, by relating them to previously acquired knowledge, and by transforming both into something new and meaningful (Smith, 1990; Weaver, 1990). In contrast to the parts-whole notion of the reductionist, learning is seen to move from the whole to the parts and back to the whole. Poplin (1988b) has related this to Whitehead's stages of intellectual growth: romance, precision, and generalization. A review of these stages helps clarify what is meant by the whole, part, whole relationship. The first stage, romance, Poplin relates to the first "whole" when a curiosity or craving for new information is developed where, as Whitehead (1929) has said, lie "unexplored connections with possibilities half disclosed by glimpses and half concealed by the wealth of material" (p. 28). This is the stage wherein importance of a subject or a concept is realized. In the second stage, precision, the focus is on exactness of form, wherein there is a need to gain control over details. This, according to Poplin, relates to the "parts" stage of the learning

process. (It should be noted here that this is the stage in which most education focuses: the gaining control of the elementary units.) Holistic educators agree with Whitehead when he states that the precision stage without romance is meaningless, since the general understanding of the romance stage gives these facts their meaning. In contrast the reductionists maintain that the parts need to be examined before one can gain an understanding of the whole. For example, it is necessary to learn all the letters in the alphabet prior to attempting to write. By contrast, holistic educators feel that through the act of trying to communicate in writing, the letters will be learned as they are needed. Whitehead's final stage, generalization, is that stage wherein the learner integrates what she has learned and returns to the whole.

Views on generalization

The concept of generalization is valued in the holistic notion of education as well as in the reductionist notion, but the holistic educators see it as a much more natural process since, in many ways, they see it as implicit in the process of constructing new knowledge (Goodman, 1986; Poplin, 1988b; Weaver, 1985). The reductionists, on the other hand, see generalization as coming last in the process, and for the most part, that it needs to be taught (Deshler, 1981; Englert, 1990; Lloyd & Landrum, 1990). There has been considerable attention paid to this by the reductionists since finding a way to get students to transfer their learning has been problematic (Gallagher & Wansart, 1991; Kimball & Heron, 1988; Swanson, 1989). The holistic educators see this difficulty as being related to the reductionist approach and its overall view of the learning process:

> The parts, the facts, and the skills taught in reductionistic ways are not really learned, that is, they are not integrated into the whole that students are already constructing, a whole that would allow them to generalize. . . (Poplin, 1991, p.18)

Perception of error

Another area which is seen as one of conflict centres around the way error is perceived. Error in the reductionist framework is to be avoided, while the holistic educators see error as a part of the process learners must go through so they may come to know that a transformation needs to take place. Pressley et al. (1992), in response to Poplin's (1988a) criticism of the way reductionists treat errors, pointed out that errors are used as an opportunity for the teacher to understand the difficulties that the student might be having. His comments lead us to believe that he

still does not understand that Poplin is referring to the self-regulating function of errors as opposed to error as a tool for the teacher. In fact, Piaget (cited in Gallagher & Wansart, 1991) discusses the importance of error in transforming a previously understood concept. He saw "failure leading to puzzlement" as a driving force in development and felt that if this process were interrupted, it could totally disrupt the learning process.

Contextualization of knowledge

The reductionists see knowledge existing in distinct forms, as if it can be broken into components, presented, and then reassembled into a meaningful whole. This concept in special education has resulted in the proliferation of a number of highly specialized commercial programs where information has been analyzed by professionals and presented in a "bottom up" fashion where the most elementary concepts are presented first and then the more complex concepts are gradually introduced in a highly sequenced fashion. These packaged programs have not only been for the teaching of academic skills and strategies but for social skills as well.

Smith (1981), a holistic educator, describes why the programmed materials operate in a way contrary to the way children learn:

> All programs fractionate learning experience. Because learners cannot be left free to wander at will through (and out of) the program. . .tasks are broken down into small steps without evident relationships to each other or to reading and writing as a whole. (p. 637)

The holistic educator sees information as meaningless unless it is presented in a way that is connected to the student's experiences and to other information presented in the class. "A constructivist takes the position that the learner must have experiences with hypothesizing and predicting, manipulation of objects, posing questions, researching answers, imagining, investigating and inventing" (Fosnot, 1989, p. 20). This implies that a rich environment should be provided so that students can select their own material based on their interests, experiences, and developmental level. This contextualization of learning is central to the holistic concept. This aspect of learning also means that skills are to be learned when needed while doing meaningful tasks (Weaver, 1990; Edelsky, Altwerger, & Flores, 1991). This explains why spelling is taught in the context of writing: as the student seems ready for assistance and instruction in spelling, the teacher selectively introduces various spelling patterns. The reductionist notion of spelling, on the other hand, is best described by one of its proponents, Isaacson (1989).

> Spelling is not learned incidentally, and teachers cannot expect transfer from other areas of the curriculum. Teaching spelling strategies, providing positive practice for incorrectly spelled words, and giving positive reinforcement for correctly spelled words produce the greatest gains in spelling achievement when compared to undirected free-study methods whereby students learn spelling in any manner they choose. (p. 245)

Isaacson's description of spelling makes it clear that the reductionist approach centres around the teaching of spelling in isolation. It is important to note here that his claims of the success of the teacher-directed systematic approach refers to gains on isolated spelling tests. Holistic educators would not argue that this might be the case; but they are not interested in the results of isolated spelling tests, since research has not supported the transference of spelling learned on spelling lists to writing (Weaver, 1990).

Social context of learning

Another conception integral to the holistic approach is that meanings are derived by learners in a social context (Ford & Harste, 1982; Vygotsky, 1962). The social process is seen as both a catalyst and consolidator for individual thinking. Vygotsky thought that social interaction with others provided the necessary scaffolding for construction of meaning. This suggests that students need frequent opportunities to interact with others in the classroom. The use of cooperative learning activities along with interactive teaching techniques are important for facilitating learning. By contrast, the reductionists in special education have been more concerned with the most efficient way to deliver the content which has often resulted in students working in isolation from others on programmed materials. This is not to say that the reductionists do not value social interaction but it is seen as a separate goal from acquisition of knowledge. Its value is seen more in relation to social modeling than as a means of facilitating the creation of new knowledge between teacher and student.

Concepts of assessment

As a result of the differences described above, the assessment practices differ between the two educational concepts as well. Assessment in the reductionist model is based on the concept that it is possible to isolate knowledge into discrete parts. Therefore it is possible to devise tests which measure whether various concepts have been learned. Since the holistic educators see knowledge as being constructed, the possibility of

using a standardized testing instrument runs contrary to their beliefs (Valencia & Pearson,1987). They believe that learning "occurs in contexts where the child sets the purposes for learning, determining what is learned and how it is learned" (Dudley-Marling, 1986, p.34). As mentioned earlier, the context is part of what is learned and must be considered in the assessment process. The holistic educators maintain that students should be assessed in natural settings, doing authentic tasks (Valencia, 1990). Their assessment practices are more individualized with the purpose of helping the student understand the process of learning various tasks. With this orientation, assessment and instruction actually seem to merge. Consider for example the portfolio assessment process (Gomez, Graue, & Bloch, 1991; Valencia, 1990) which is used by holistic educators. The portfolio is a collection of samples of a student's work which is put together by the student and the teacher. The portfolio records an ongoing process which encourages collaborative reflection by the teacher and student on the student's progress. This type of assessment process is instructional at the same time as it is performing an assessment.

Teacher-directed vs. student-directed learning

It is also clear that there is a conflict between the two models regarding who should be in control of the learning process. The reductionist sees learning as being teacher-directed while the holistic educators see learning as primarily student-directed. It follows that if one believes that knowledge derives from a process of transmission of known facts to others that the most efficient way to achieve one's goal is to have the teacher systematically deliver a prescribed content. However, if one sees learning as a process of construction, it makes sense that a teacher could not direct this process but could only facilitate the learning through providing an enriched environment for learning and guidance when the child requires assistance. This has an impact on the development of independence, a goal which both conceptions of education have as an aim. While the reductionist sees independence occurring through a carefully crafted teacher-directed curriculum designed to give the students skills for independence, the holistic educators feel that independence can only be fostered by letting the student be involved in selecting the content of the curriculum.

HOW ARE THE REDUCTIONIST AND HOLISTIC CONCEPTS OF EDUCATION COMPLEMENTARY?

Considering all the ways in which these two conceptions of learning conflict, it is difficult to see how they could, in any way, be complemen-

tary. In fact, most supporters of the holistic approach would probably say that there are no ways in which they are complementary. While there is a tendency for each framework to reject a connection with the work of the competing framework, this wholesale rejection may be the cause of the loss of some valuable information. Consider:

Contextual use of the rules of language

Holistic educators are beginning to realize the need for explicit attention to certain aspects of learning for some children (Freepbon & Dahl,1991; Staab, 1990; Weaver, 1990). The holistic approach has not dealt with the explicit nature of some of the mechanics such as phonics, grammar, and spelling, so the work in these areas by reductionists could be helpful if it were to be used contextually and with less emphasis on the order of presentation of the material. For example, we know that grapho-phonic awareness is part of the reading and writing process. Students who are having difficulty in focusing on the sound-symbol relationship may need some assistance in this area. If the teacher does not have some basic understanding of phonics as well as a knowledge of instructional strategies, which focus on the sound-symbol relationships, she will not be able to make explicit for the student the relationships when needed.

Explicitness of expectations

In the holistic framework, the lack of explicitness of classroom rules, procedures, and expectations for some children is problematic. Delpit (1988) has mentioned that the implicit and sometimes ambiguous nature of these rules and procedures can put children who are not from a middle class background at a disadvantage. Students who come to school with a linguistic background that differs from the one that prevails in the schools feel an alienation from the time their school careers begin. Brice Heath (1982) discusses the differences she found in discourse structure in the homes in a black community: the form of discourse prevalent in those homes represents a form of communication rather different from that which occurs in schools, which is the same well-established discourse that occurs in white middle and upper class homes. The confusion that this creates for students in their first experiences in school often causes them to be labeled as incapable or unwilling to participate in class. Students from a culture wherein expectations are made clearer often have difficulty determining the rules compared to children from the dominant culture who are able to pick up the subtle cues regarding the teacher's expectations. So the need to examine our expectations and to determine how best to communicate

them to students from backgrounds which differ from our own is evident. For teachers who have become proficient learners it is sometimes difficult to understand the complexity of a particular task and it would be easy to oversimplify or leave out some important information during the instructional process. While this is a problem that can occur in classrooms based on either the holistic or the reductionist framework, both have strengths to bring to the process. The reductionists have put more emphasis on the analysis of specific academic tasks and on how to be explicit in the instructional process. Their work could bring some insight in determining what might be missing in the instructional process by some educators. This is not a suggestion to use a more prescriptive teaching approach, it is merely suggesting that the information be used to facilitate making it more explicit what are the expectations of the teachers. On the other hand, the holistic educators have emphasized the importance of relating the student's background, both personal and cultural, to the learning process, and have developed instructional strategies for facilitating this process. Both the emphasis on the personal background and the explicitness of instruction are needed to provide the type of environment wherein learning can take place effectively.

Process of facilitation

The area of facilitation is another which has the potential to be complementary to both fields. Holistic educators have focused their concern on when to facilitate, and on being sensitive to how much assistance to give at a certain time (Weaver, 1990). By contrast, the reductionists have spent more time on the development of specific cognitive strategies to use in various areas of instruction (e.g., paraphrasing strategies, test-taking strategies, mnemonic strategies). While strategy instruction has been utilized in a more wholesale fashion than would be approved by holistic educators, these investigations of effective strategies could prove useful. Unfortunately the prescriptive nature of the strategy work has made holistic educators reject any possible connection. But if the strategies developed were used in relation to Vygotsky's (see Cole et al., 1978)) notion of the "zone of proximal development" the results should be beneficial. (The "zone of proximal development" refers to the distance between the child's actual development in an area and the level of potential development which can be reached with guidance from an adult or a more capable peer.) The interactive dialogue between the child and the adult or peer tutor encourages the child to reflect on the problem encountered and de-

velop a more complete understanding of the task (Gallagher & Wansart, 1991). If the dialogue could be informed by some of the strategy instruction and information that has been developed under the reductionist notions of education, the teacher might be more effective at the facilitation. An example of such a strategy is Palinscar and Brown's (1984) reciprocal teaching strategy.

Also related to the area of facilitation is the concept of encouragement. The behaviorists have studied the complex nature of encouragement and even have a language that describes different types of reinforcement. Of course the manipulative aspect of this notion of encouragement does not relate to the holistic educator's ideas on education. But during the course of relating in a classroom it is possible to send messages to students without realizing it: messages which are counter to the facilitation process. So understanding the effects of interactions such as praise and subtle contingencies operating in the classroom could prove insightful.

CONCLUSIONS

I have mentioned a number of ways in which the holistic and reductionist conceptions of special education appear to be in conflict and ways that they appear to be complementary. These complementary aspects could develop with time. Already there seems to be some indication of this in the whole language movement. For example, in Weaver's (1990) book *Understanding Whole Language: From Principle to Practice*, she notes that direct instruction does occur on occasion within the holistic model.

> Some of the direct teaching within a whole-language, transactional classroom consists of demonstrations in which the teacher is personally involved and in which the students are invited to engage. Other direct teaching occurs in response to students' demonstrated needs: a matter of seizing the "teachable moment". A third kind of direct teaching occurs more or less incidentally within the context of authentic literacy events in which students are engaged. Still another kind of common direct teaching takes the form of a 'mini-lesson'. . . .(p. 13)

Further evidence of a liaison between the two practices is seen in the number of the cognitive strategy theorists who are moving away from the more reductionist approach influenced by the behaviour modification approach, to focus more on the work of Vygotsky and Piaget's constructivist concepts (Derry, 1990; Gallagher & Wansart, 1991; Palincsar, 1990; Palincsar, David, Winn, & Stevens, 1991). This focus

is resulting in their strategy intervention practices moving closer to the holistic educators' notion of facilitation.

This is not to suggest that there will be a merger between these two disparate approaches to education, but that in all probability there will emerge, as long as minds remain open and dialogue continues to occur, a deeper understanding of the complex mysteries of the learning process.

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