INSTRUCTIONAL DEVELOPMENT: FRUIT FLY OR LEMMING?

Ivor K. Davies

Professor of Education
Indiana University

Assistant Executive Director
Audio-Visual Center

"His thought is not to give flame first
and then smoke,
but from smoke to let light break out."
Horace

Instructional development is at a cross roads. In its search for excellence, the title of the symposium of papers published in the first issue of this journal, it has reached a critical point of inflection signalling a point of change in its history. The seven papers by Roger Kaufman, Bob Gagne, Dave Merrill, Sue Markle, Gerald Faust, Dick Snow and Eva Baker all portray this point, as well as indicate the influence of forces outside the field of instructional development. Indeed, they not only indicate the point of inflection individually, but even more markedly when they are viewed together as one portrayal of what the field is about. For this reason, despite their individual praiseworthiness, they merit more acclaim when viewed as a whole.

In his introduction to the symposium, the editor, Ken Silber, points out that the seven authors "have theorized about, researched, developed, and implemented the techniques we use today, and, hopefully, will be using in the future to develop instruction." He goes on to argue that the authors represent a variety of interests and disciplines, and, in some cases, have differences of opinion. Overall, Silber says, the ideas represented in these seven papers—on needs assessment; capabilities and learning hierarchies; content analysis; conceptual networks; instructional strategies; aptitude treatment interactions; and evaluation—represent the cutting edge ideas in instructional development today. And, so they do. But we still have to deal with the issue of "Where do *we* go from here?"

The point of inflection which instructional development has reached, and

which these papers seem to illustrate, is critical not only in terms of the theories, paradigms and strategies available to, and valued by, developers, but also in terms of a continuance of, and hopefully increase in, the resources available to them. In other words, is instructional development to become either:

- A casualty in the seemingly endless swings of the pendulum in education, a passing fashion no less, *or* will it be able to renew and re-invigorate itself as an area of continuing substance and integrity.
- A diluted, and perhaps more palatable successor of programmed instruction (from which so many of its leaders, as well as its models and strategies appear to be derived), *or* is it to grow as a worthwhile discipline by developing methods of inquiry capable of making significant and elegant contributions to the *prevention* and *solution* of instructional problems.

To put it even more bluntly, does the Division of Instructional Development (DID) and the journal have a future, or only a past to exploit?

The seven papers making up the symposium suggest that there is, indeed, a rising sun on the horizon once again, but the evidence that they present may not be persuasive enough to convince people within the field let alone those outside it. Convincing ourselves is easy, convincing others may be more problematic—yet it is the others, by and large, who will have to be convinced, if developers are going to stand any chance of obtaining the commitment that will be needed. This year, therefore, can be a time of self-assessment. A time when reflection may be more important than evaluation (narrowly conceived), a time to explore alternative options rather than continue to seek the "one best way," and a time to decide what instructional development can become rather than unthinkingly accept constraints imposed upon it by the force of events. It is the nature and the direction of ID's growth that we need to ponder.

Evolution and growth

Growth in any living organism, as well as in most areas of human endeavor like instructional development, tends to follow one or other of two basic growth curves [see Haldane, 1963; Salk, 1973]:

[1] Model for expanding populations. This model is characterized by the S-shaped or sigmoid growth curve. Such a curve, see Figure 1, shows an initial period of little growth, followed by a long period of rapid but sustained growth, followed by a period when growth levels off or stabilizes at some optimal level. The S-shaped growth curve is best illustrated by the fruit fly (Drosophila), as well as by many micro-organisms and most populations. Many subject matter areas have tended to follow a similar growth pattern. Geography is one example, and a cumulative analysis of the literature of other disciplines is especially revealing, and of doctoral dissertations even more so.

[2] Model for fluctuating populations. This model is characterized by the W-shaped or sine growth curve. Such a curve, see Figure 1, shows short periods of rapid growth, followed almost immediately by regular and suicidal catastrophes. Such boom-burst cycles of growth are characteristic of the lemming (Lemmus), a small rodent found in Alaska, Siberia and Scandinavia, which commits suicide en masse in the sea, as well as of the snowshoe rabbit (Lepus americanus), mice, voles jerbils and other Muridae (see Huxley, 1963). Many movements in Education have tended to follow this boom-burst, boom-burst, boom-burst growth cycle, particularly in the area of such basic skills as the 3 R's.

The basic dilemma for instructional development is that it has moved from a period of little growth, into a period of rapid and sustained growth in a very small number of years. Regardless of the future, however, one point about growth, of importance to ID, still remains to be considered.

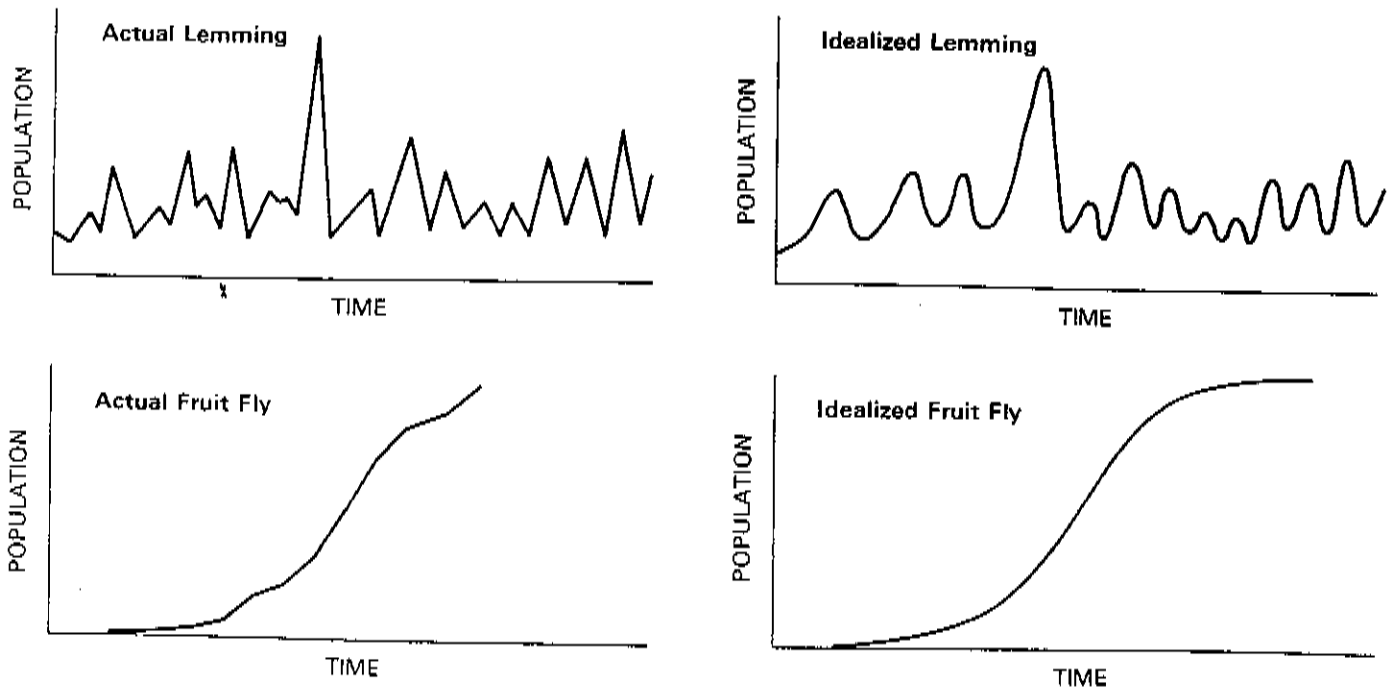

Figure 1. Idealized Lemming and Fruit Fly Growth Curves

Development During Periods of Boom and Burst During any period of initial growth, when conditions are favorable and the number of people engaged in the new activity may be small, the intensity of selection may be very low. As the area undergoes rapid and sustained growth, and a peak is approached, a more rigorous selection of models, strategies and techniques will occur due to the pressure of competition. Ideas lacking in substance or usefulness will tend to be abandoned, whilst ideas which have been demonstrated to have utility and integrity will survive and prosper. As the boom bursts, however, only those ideas which prove most resistant to the forces which caused the turnaround will survive. In the subsequent period of unfavorable environmental conditions, survival or selection will depend upon the ability of ideas to resist the new negative features present in the environment. This will largely depend upon their ability to make a wider contribution, outside the area in which they were initially developed.

After the period of setback, in which some ideas will survive or lie dormant, a new cycle can start as conditions begin, once more, to favor a new burst of activity. During the period of initial growth and extra-ordinary flowering of models, strategies and techniques characteristically occur, with marked departures from previous norms and restraints. A high proportion of the ideas, however, may be "deformed" in some way, with the amount of the deformity depending upon the degree of variation. As growth continues, however, and conditions within the discipline become again more rigorous and competitive, extreme variants will tend to disappear. The methods of inquiry characteristic of the whole field, though, are likely to have a similarity with those of the previous cycle of growth, but will be, nevertheless, still recognizably different and distinct.

Instructional Development During the Last Century

Bearing the above discussion in mind, let us look at the history of needs assessment, specific objectives, content analysis and evaluation (for more detail see Davies, 1976). Although the field of instructional development has a history of but some twelve or fifteen years, many of the issues, models and strategies which are recognized, today, as peculiarly those of ID, predate it by at least one century. Needs assessment and objectives, for instance, were well developed concerns during the mid 1800s. They had a literature which still echoes in many writings today, as a result of the influence of Herbert Spencer, Johann Herbart and Gabriel Rosmini. Herbart's book *The Science of Education*, republished in translation by Beatrice Mulliner in 1898, is particularly noteworthy to developers today. The period was one of great interest, with its concern with identifying which knowledge was of the most worth, the problems of sequencing information, and the difficulties involved with designing instructional situations.

By 1880, however, the boom had burst, and the pendulum swung in the opposite direction against a *science* of education. Despite her quotation from Browning:

"Sacrifice is offered for and to
Something conceived of.
An ignorance of means may minister
To greatness, but an ignorance of aims
Makes it impossible to be great at all."

at the masthead of her second chapter, entitled "The Aim in View," Mulliner still failed to remove the deep rooted suspicion. Glayre's reproachful words to Pestalozzi were flung at Herbartians, as the new scientists of education were called, and "Vous voulez mecaniser l'Education" became the death rattle of a lost cause. (Yes, Glayre is alive, well and with us still!)

In the lull following the boom of the mid 1800s, the idea of analysis survived in education, but at a low level of visibility. Then, during the first years of the present century, following the successful application of science to industry, together with the growth of 'popular' education for all, a new burst of interest occurred with the idea of improving education through the application of science. Encouraged by the work of Taylor and Gilbreth, and especially by their techniques of analyzing the requirements of jobs as they sought to identify the 'one best way' of designing work, a new cycle of activity began. The cycle reached its full flowering in the 1920s, particularly as a result of the work and influence of Werrett Charters and Franklin Bobbitt. The importance of task analysis, or as they called it 'activity analysis,' and the importance of defining objectives in highly detailed terms loomed large. Charter's book *Curriculum Construction*, published in 1924, deals in detail with such topics as the: prestige of systematic knowledge; analysis of activities; limits of analysis; determination of objectives; selection of methods; sequencing subject matter; interaction of content, learner ability and interests, and developmental stage; and teaching methods.

Charter's seven stage model for development, even by today's standards, is a thought provoking sequence of development activities. Included in it are stages which: identify major objectives by analyzing people in life settings; analyze objectives by means of a matrix of ideals and activities; identify working units and order them in importance; raise to positions of higher order those ideals and activities high in value for children, but low in value for adults; identify those that are best dealt with in school, and those best handled out of school; collect the best known practices for handling ideals and activities; and arrange the material in an instructional order according to the psychological nature of children.

The major contribution of this period of development, however, is the weight that was given to the power of analysis, and the emphasis given to the importance of defining highly specific objectives. Charter's activity chart, for mapping objectives, has many advantages over the list structure that developers so commonly use today. (Although the idea was re-introduced by a large number of the contributors to Bloom, Hastings and Madaus' *Handbook of Formative and Summative Evaluation of Student Learning*, published in 1971, it is still not characteristic of either the work of developers, nor is it to be found in the majority of their professional writings). Despite all the activity of the 1920s, as well as the many creative contributions, the systematic movement collapsed once more before the growth of progressive education. Franklin Bobbitt, in his introduction to his new book *The Curriculum of Modern Education*, published in 1941, wrote that he was "content to let it rest in peace."

The rest of the story is too well known to need re-telling here. Ralph Tyler, a former student of Charters, kept the lamp alight by taking the ideas behind specific objectives into the area of test construction. But with Sputnik, national pride was dealt a severe blow, and massive resources were made available to renew education. Some of these became

available to activities that were later 'captured' under the term of instructional development. Objectives were re-discovered, as if for the first time, and the importance of defining them in 'the one best way' inevitably overblown by over zealous initiates. Analysis, and the importance of systematic planning, once more became by-words, and seen as the only way of going. Others discovered the joy of drawing boxes with arrows.

The Allometry of Instructional Development

Although growth, regardless of which of the two models is followed, normally implies some sort of orderliness as far as the whole is involved, it does not necessarily imply that there is an orderly process of symmetrical enlargement of the *parts* making up the whole. Just as the Irish elk possibly became extinct due to the exaggerated growth of its antlers in relation to its whole body, thus impeding movement, so the parts of a subject area may grow out of all proportion to the whole, and threaten the continued existence and acceptability of the discipline. Allometry, which studies patterns of unequal or disharmonic growth, offers, therefore, a concept useful to the survival not only of living organisms but also to the integrity of such area of disciplined inquiry as instructional development.

In considering the application of allometry to instructional development, it is important to bear in mind the truism that conditions and forces that were advantageous to ID during the early stages of a growth cycle, may become neutral or even disadvantageous later on. Similarly, models and techniques that were important, if not essential, in the early years of a discipline's cycle of growth, may threaten the continued acceptance of the area unless some re-tuning or re-focusing takes place to bring them into line.

Two strategies of instructional development, both discussed in the symposium papers, which may have grown disharmoniously, in the current cycle, as well as during the one in the early years of this century, involve objectives and evaluation. This is, in no way, to be taken as a negation of the importance of these two activities, but only a recognition that to many of ID's clients they appear to be threatening and anxiety provoking. The very terms 'evaluation' and 'objectives' have become emotive slogans, bogeys more fearful than what is really implied or involved. Even to developers, the activities associated with 'identifying objectives' and 'carrying out evaluation' have become such resource consuming tasks, that little time is left for other necessities like learner analysis —other than by means of some superficial treatment. It is almost as if, instead of helping to solve instructional problems, they 'colonize' them instead. Both evaluation and objectives, to use the analogy of Eva Baker, can in insensitive hands become rigidly stylized steps. Politically important, but—especially in the case of summative evaluation—too often offering little of real significance when measured against the enormous resources that may have consumed.

What is necessary is that instructional developers re-assess the basic paridigms and models of ID (turn ID in on itself, as it were), re-tuning the whole process, as necessary. There is no 'one best way,' everything depends upon the needs of the task and the people who have to be served, and there is no reason to believe that every technique available to developers (including defining objectives) must always, without exception, be part of the mandatory practices of development. Furthermore, there are techniques which still need to be acquired or developed, techniques which recognize the importance of people as people and as individuals, each with their own intrinsic merit. Identifying the importance of different cognitive styles is a start, but there is still a long way to go. The lesson is an important one. It is in the *ideas* of instructional development, not in its mechanical achievements, that the real potential of the discipline is to be found. The allometry of some of its values, therefore, will repay analysis, at least from the point of view of the immediate future.

Two Contrasting Value Systems

But what of the future? Is instructional development to continue on the lemming curve, doomed to destroy itself yet again, as the pessimists would have it, or is instructional development able to assert itself and begin a new growth pattern on the fruit fly curve, as the optimists would have it, reaching new levels of excellence? The important thing is that developers are uniquely able to make the choice, since the pessimists are themselves evidence that there is a signalling device able to sound warnings of danger. The engineering approach, with its apparent attempt to 'mechanize' education, will simply not do. The serious question, only just beginning to be debated at a professional level, is whether ID can be content with an approach in which people appear to be but a variable to be manipulated, rather than as a given with a rich potential to be realized.

Essentially then, instructional development is facing a conflict between two contrasting value systems, each of which offers a different set of assumptions for development activities. Others have debated these value systems in instructional development (see Davies, 1973; McBeath, 1969) but the wider case for society has been put dramatically by Jonas Salk in his book *The Survival of the Wisest*, published in 1973. He argues that if people are to influence the course of their own growth, they must seek a critical moment (a point of inflection) to move from what he calls an "Epoch A" set of values to an "Epoch B" set of values. He points out that in the course of evolution, many more things have become extinct than have survived, very often because of the way that they have dealt with themselves. They brought about, almost inevitably, their own destruction. If Salk's model can be translated from the sphere of world problems, to the world of instructional development, then the problem facing ID can be restated. Is instructional development to continue with an Epoch A set of values, or is it to develop a set of Epoch B ones. The symposium papers suggest that ID is already making the change, for the values they appear to represent are predominantly those outlined in the Epoch B column of Figure 2.

Epoch A reflects a world of deterministic values, in which survival is the reward of the fittest. Independence is the prime motive, and the immediate goal is to seek for remedies. Competition is seen as a prescription for personal development, and the basic strategies involve a win/lose, either/or, types of response in the context of a world in which self-repression and outside restraints loom large. Epoch B reflect a world of possibilistic values, in which survival is the reward of the wisest—for in wisdom lies strength. Interdependence is the prime motive, and the immediate goal is prevention rather than cure. Cooperation is seen as a prescription for personal development, and the basic strategies involve double win, or inclusive "and," types of response in the context of a world in

which self-expression and self-restraint loom large [see also Bronowski, 1977.]

These ideas are appealing to a wider and wider group of professional people both in Europe and in the United States. At the end of last year an Epoch B group called together a meeting in Europe of journalists, economists and administrators from all over the world to discuss *"Media Values for a New Epoch."* No instructional developers appear to have been invited. The point, however, is that ID, too, needs such a debate, in order to consider "Instructional development values for a New Epoch." It is not necessary to regard Jonas Salk as a new world prophet, but rather (in the words of a colleague of his) "as an instrument maker who has offered us a useful instrument through which we can see the world in a new way."

EPOCH "A" VALUES	EPOCH "B" VALUES
Foreclosing on the possibilities by:	*Opening up the possibilities by:*
Judging between what is right and wrong, good or bad, true or false.	**Choosing** between alternatives; neither of which is provably more nearly right than the other.
Searching for the one best way of doing things, and believing that it can be found.	**Searching** for the best alternatives from which to choose, recognizing the needs of the task and the people involved.
Searching only for remedies for existing instructional problems. Cure orientation.	**Seeking** for ways to help prevent instructional problems from occurring. Prevention orientation.
Focusing on efforts, and the resources needed for efficient development. Stress is on the authority developers need.	**Focusing** on the contribution that instructional development can make by gearing efforts to results. Stress is on responsibility and sensitivity.
Attending to far too many things in an attempt to attend to every aspect of the traditional ID model.	**Concentrating** upon a few major areas where real professionalism will produce outstanding results. Stress is on priorities.
Emphasizing learner weaknesses and deficiencies, emphasizing what cannot be.	**Building** on learner strengths, emphasizing what can be and what ought to be.
Result: efficiency [i.e. doing things right.]	**Result: effectiveness** [i.e. doing the right things.]

Figure 2. Epoch "A" and Epoch "B" Values in Instructional Development.

The seven papers of the symposium "Excellence in Instructional Development" represents ID's instrument makers at work, and they too offer us useful instruments through which we can discern an emerging new world of instructional development. Care must be taken, however, that in our haste to adopt new ideas, we fail to discern the value systems that they represent. Epoch A is for the lemmings, Epoch B is for the fruit flies. Which are we to be?

Epilogue

"Where are you going?" asked the lemmings.

"Oh, I don't know," said Bob the developer lemming.

"But you can't go, we have too much to do. Festival time is coming up, and we have to plan for the en masse migration to the sea. You can't go."

"Yes, I can," said Bob. "I don't *have* to help you."

"But you are a lemming. We have to help each other."

"*You* help one another," said Bob. "I'm not one of you. I am not a lemming any more."

"Well, what are you then?" the lemmings shouted. "Tell us."

"I don't know," said Bob, the developer, as he headed firmly *away* from the sea. "Maybe, I'll be a fruit fly!"

Moral: Heaven helps those who help themselves.

References

Bloom, B.S., Hastings, J.T., & Madaus, G.F. (eds.) *Handbook of Formative and Summative Evaluation*. New York: McGraw-Hill, 1971.

Bobbitt, F. *How to Make a Curriculum*. Boston: Houghton Mifflin, 1924.

Bobbitt, F. *The Curriculum of Modern Education*. New York: McGraw-Hill, 1941.

Bronowski, J. *A Sense of the Future*. Cambridge, MA: MIT Press, 1977.

Charters, W.W. *Curriculum Construction*. New York: Macmillan, 1924.

Davies, I.K. *Competency-based Learning*. New York & London: McGraw-Hill, 1973.

Davies, I.K. *Objectives in Curriculum Design*. New York & London: McGraw-Hill, 1976.

Haldane, J. *Evolution: The Modern Synthesis*. London: George Allen, 1963.

Herbart, J.F. *The Science of Education*. Translated by B.C. Mulliner, New York: Scribner, 1898.

McBeath, R.J. Is education becoming? *AV Communication Review*, 1969, 17, 1, 36-40.

Salk, J. *The Survival of the Wisest*. New York: Harper & Row, 1973.

Taylor, F.W. *Scientific Management*. New York: Harper, 1912.