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The Little College at Bowling Green: Developing Critical Thinking Skills in a General Education Context

By James L. Litwin, Richard C. Giardina, M. Neil Browne

ABSTRACT

For the past five years, the Little College at Bowling Green State University has been experimenting with various approaches to developing the critical thinking skills of incoming freshmen. Data resulting from evaluative research completed demonstrate that students can be helped to achieve significant gains in their ability to think critically. They also suggest differences in the viability of alternative curricular approaches to achieve this goal. The paper itself profiles many of the problems and issues pertinent to "experimenting" programs, including assumptions about the goals of general education, faculty recruitment, pedagogy, and evaluation. At present, the Little College finds itself in the mainstream of what is being called "competency-based learning."

For the past five years, Bowling Green State University has been experimenting with critical thinking skill development in a curricular program known as the Little College. The Little College was begun in September, 1970, as a one-quarter experience for incoming freshmen. It had and continues to have as its goal the development of critical thinking capabilities on the part of students, as well as an understanding of how these basic analytical capabilities can be used in the day-to-day solution of problems. A further goal is the cultivation of a predisposition on the part of students to use these capabilities for that purpose.
The creators of the Little College, and the faculty members who have taught and are presently teaching within it, take seriously the notion that the purpose of a liberal education is to help free students from dependence upon "authority figures" to do their thinking for them and consequently to permit them to think for themselves in the making of crucial decisions. After all, the freshmen who had come to Bowling Green "had come to an institution which claimed, as do all colleges and universities, to be interested in developing creative and disciplined minds; yet," according to the authors of the report of the first year of the Little College, "there was little in the freshman curriculum which even pretended to help them to think for themselves (4, p. 339)."

The Little College has been a response to that curricular need, a response that has not remained static (as is the fate of many innovations), but one that has successfully adapted and changed over the years. As such, the Little College provides a relevant illustration not only of a program with the earlier-described goals, but also of the dynamics associated with the development and evaluation of an "experimenting" program. This article profiles many of the problems and issues pertinent to those dynamics by describing the evolution of the Little College during the past five years, including an explanation of its varied approaches to the development of critical thinking skills and an analysis of evaluative data demonstrating the viability of a program explicitly attempting to help students think critically for themselves.

Before beginning our description of the program, it might be profitable to attempt to place the Little College within the context of general education. A function of general education is helping develop in the individual student a set of basic human capabilities or general life skills enabling him to understand his own drives and motivations, to relate those drives and motivations to real possibilities, and to implement them in such a way as to achieve the desired results. General Education becomes the essence of the baccalaureate experience in that it prepares the individual to face problems and potentials, not as a passive reactor but as an aggressive actor, seizing the initiative by pursuing hypotheses, weighing evidence, drawing conclusions, making decisions, and following through on them.

Scholarly interest in the nature and function of general education is by no means new. There is a wealth of literature dealing with the matter. Nevertheless, such a prestigious group as the recent Newman Commission feels there is still much work to be completed in this area: "The fundamental values of a general education have been put forward as useful preparation for a productive life, for social responsibility and for personal fulfillment. . . . But if these values are to be the yardstick, then it is essential to ensure that academic programs do indeed provide an education that is effective for these purposes. A re-examination and a renewal of all of post-secondary education and particularly of liberal education may therefore be the most important agenda item of the 1970's (3, p. 7).

If general education is indeed the essence of baccalaureate study, then
the development of critical thinking abilities is the essence of general education. Of course one might suggest that critical thinking skill development has been a primary aim of higher education throughout the centuries. This is undoubtedly correct; however, all too often, development of critical thinking abilities is articulated as the goal and then forgotten in the rush to expose students to as much content as can possibly be crammed into the typical college course.

Faculty members, in general, fail to articulate precisely what they mean by the term "critical thinking," how their particular course will go about the task of developing critical thinking skills, and the mechanism by which the achievement of critical thinking competency will be assessed. Furthermore, rarely is an indication given to the student that it is important for him to develop critical thinking skills because possession of such skills will enable him to analyze critically those relevant elements of the world around him and to utilize that critical analysis in making those crucial decisions affecting his life.

The faculty of the Little College, on the other hand, quite clearly begin with the notion that critical thinking skill development can be accomplished via academic programs and experiences, and that colleges and universities can facilitate this development. They also share the notion that the attainment of minimally acceptable competency in critical thinking skill development is an essential characteristic of the liberally-educated individual able to lead both a productive and a personally satisfying life.

*Development of the Little College [1970-1974]*

The Little College is now five years old. During these formative years, much has been learned by those who have participated in the planning and operation of the program. The purpose of this section will be to share with interested readers a description of the major developmental stages through which the Little College has progressed. In addition, we will touch briefly on several recurring themes which have been encountered by those responsible for determining the content and emphases of each Little College. We hope that such shared experiences can aid other universities fulfill the almost universal pledge that their graduates will possess critical thinking and decision-making skills.

One overriding assumption which has united each year's Little College has been a dissatisfaction with prevalent attempts to provide general education. Much of what follows can be appreciated more fully by frequent reference to this assumption. Our dissatisfaction has focused on the common practice in introductory courses of teaching the course as if our most important cognitive skill were memory. We have consistently rejected this notion and have substituted the pursuit of critical thinking skill as being the primary objective for general education. What has distinguished one year's Little College from another has been the plan for implementing this shared interest in critical thinking as a process.
Each Little College faculty has selected a particular approach to critical thinking from among numerous possible approaches which it could implement. This choice has been the most substantive decision that the faculty has made since it colors every aspect of the curriculum and evaluation system. Three basic approaches have been implemented in the five years in which the Little College has been offered:

A. The Making and Manipulation of Images,
B. Heuristic Thinking,
C. The Art of Making Sense.

This section will briefly describe each approach and indicate strengths and weaknesses that were perceived in each effort. Each approach is capable of making an innovative contribution to current general education efforts. However, we learned from experience that these three approaches are mutually exclusive unless the proposed critical thinking project has resources and time far in excess of those the Little College was able to provide. Therefore each approach must be judged according to its appropriateness for a given situation, rather than by some arbitrary standards of effectiveness. We have evidence that suggests that all three approaches can be implemented successfully in a suitable context.

The Images approach was suggested and utilized by all of the faculty in the first Little College (1970-71), and the majority of the faculty in the second year. The basic philosophy guiding the thinking of the faculty proponents of the Images approach can best be understood through a quotation from the report of the second Little College:

All rational systems are based on a conceptual framework that is as much the product of man’s purposes and needs as of the characteristics his world exhibits. Logic enables man to articulate and apply that conceptual framework, but it is neutral regarding the substance. The images which constitute what man thinks critically with are products of the continuing commerce between human purposiveness and human experience; and an understanding of that commerce is required if critical thinking it to strike its full human measure.

... At the core of every human is a set of beliefs and values which are not usually subjected to critical analysis, because people have been taught to take these beliefs and these values on faith and to base all of their subsequent judgments about their world upon them. For instance, the person who believes in the sacredness of life will base all of his subsequent decisions concerning birth control and abortion on the belief that life is, in fact, sacred. thus while critically analyzing the pros and cons of the issues, he will do so with a core of beliefs which is itself not subject to critical analyses (1, p. 5).
Through an understanding of the image-building process, students are encouraged to discover the core beliefs which shape their lives. After this act of introspection, students are briefly introduced to certain prescribed tools of analysis and evaluation. These skills are expected to prepare them for situations where they are asked to analyze whether or not a particular set of decisions would be consistent with their personal core beliefs.

The Images approach has the advantage (shared by the other two approaches to critical thinking that we have used) of stripping instructors of the security provided by their own disciplines and of forcing them to deal directly with conceptual problems rather than with elaborations on a predetermined conceptual structure which assumes away many of the central questions. In addition, the Images approach provides a mechanism for helping students recognize the assumptions and interrelatedness of those disciplines which they will encounter in their other courses.

Most of the third Little College faculty adopted a Heuristic Thinking approach to critical thinking in an attempt to broaden the objectives specified by the faculty of the first two Little Colleges. The proponents of the Heuristic approach were primarily concerned with creative skills, alternate ways of problem-solving, similarities and differences between convergent and divergent thinking, and analogical thought. All third-year faculty members made a pre-course commitment at least to attempt to give instruction in all of these cognitive skills. The Heuristic approach represents an extreme attempt to "cover" almost the complete range of cognitive skills in one all-too-brief course. The vision of the third Little College was more grandiose than any of its predecessors, but therein lay its most serious flaw.

Most third-year Little College faculty agreed in their post-course assessments that it is impossible to implement such goals as those proposed in the Heuristic approach within a ten-week period, especially in the depth necessary to enable the students to achieve any significant degree of proficiency in all of these skills. In response, future Little Colleges have greatly de-emphasized heuristic goals and have emphasized the exposition and application of evaluative skills.

With this background, we will now describe the "Art of Making Sense" approach which is the predominant approach now being used in the Little College. Most of the courses which our students will take focus on knowledge acquisition. The knowledge to be learned varies from course to course, but the underlying process is similar: students are told what to think rather than how to think or organize what they know into a functional pattern. Therefore, most of the faculty of the fourth Little College decided to pursue evaluative skills exclusively. This emphasis appeared to us to be the most useful to the student since it represents an important and relatively neglected set of skills. If universities do not teach such skills, we have seen little evidence to suggest that they will be picked up elsewhere in some non-systematic learning situation.

The first section of the course was devoted to an introduction to critical thinking skills. Three main sub-areas were identified:
1. The uses and misuses of language in which definitions, ambiguities, and levels of abstraction would be emphasized.

2. The uses and misuses of "truth" and evidence in which value presupposition, empirical evidence, and tolerance for non-closure would be emphasized.

3. The introduction to argumentation in which assumptions, arguments, induction (including argument by analogy), deduction, and formal and informal fallacies would be emphasized.

It was felt that approximately the first six weeks of the quarter should be devoted to these tasks, and that the first two areas—language and truth and evidence—would be covered in a shorter period of time than the third, introduction to argumentation.

Concurrent with the introduction to critical thinking skills, we pursued a second major goal of the course: the introduction to alternative images, perspectives, or value sets. Thus, during the first six weeks, the instructors were to expose students to a variety of viewpoints concerning a number of current or "relevant” social issues with the intent of getting the student to understand, appreciate, and become tolerant of differing opinions.

During the final four weeks of the course, the emphasis was shifted to the application of critical thinking skills. During this period, students were asked to identify the role of images and perspectives in their own and other's beliefs as well as to pose and evaluate alternative hypotheses in a decision-making setting. Instructors were free to choose an appropriate text for the first portion of the four-week period while, for the concluding two weeks, Robert Hutchins' University of Utopia was selected. The course concluded with a "grand project" or major essay based upon this last book.

The "evaluative skills" approach provided an approach with which the faculty felt comfortable, in the sense that they found the objectives attainable and among the most important they could suggest for general education. The most important criticism of the evaluative skills approach to critical thinking is that its scope is too restrictive. It omits many important learning skills which the Images and Heuristic approaches include. While we do not wish to choose only those goals that we are confident that we can achieve, an expansion of our goals beyond the scope of the evaluative skills approach has not yet yielded results.

FACULTY

The Little College has generally consisted of one fall quarter course which provides five hours credit. (The first Little College offered eight hours of credit.) Each year during the winter quarter, plans have begun in preparation for next fall's Little College course. The first and most important step of preparation consists of faculty recruitment. No amount of planning or hard work can overcome mistakes made in the faculty recruitment process. The second and third Little Colleges were beset with personality conflicts and intense disagreement over curricular strategies. Innovative programs such as the Little College have myriad natural ob-
stables to overcome, and the added problem of incompatibilities among faculty can be fatal. We learned that it is not enough to seek innovative teachers; what is important is basic agreement on the objectives which innovative behavior hopes to attain. The relative success of the fourth Little College stemmed in large part from the increased care that was taken in the faculty recruitment period. Faculty were interviewed carefully prior to selection and an unusually diligent and compatible group of teachers resulted. In particular we found that a careful selection process for faculty becomes more practical as course objectives are most sharply defined.

Each year from six to twelve regular faculty members have been recruited to teach one course (or approximately one-half of their total teaching responsibilities) in the fall Little College program. The faculty who have participated in the Little College are generally drawn from the social sciences. Perhaps it is unique to our campus, but social scientists have demonstrated greater interest in the early acquisition of cognitive skills. In addition, social scientists are more willing to respond to classroom questions for which ambiguous answers are the only available response. Their training in the analysis of human behavior has prepared them for situations where conclusions are seldom certain. Because we have emphasized the use of critical thinking skills as an instrument primarily appropriate for divergent thinking, faculty who are uncomfortable when analyzing questions which are not amenable to precise answers have been less successful as Little College instructors.

PLANNING

After faculty are selected, planning sessions are held during the spring and summer. Objectives are defined, program evaluation is planned, a grading system is chosen, and curricular materials are selected during these planning sessions. Each year the scope of our planning has expanded as we become more aware of specific problem areas which can be avoided through open and thorough discussion.

Especially important has been the increased attention we have paid to course objectives. During the first two Little Colleges, faculty agreed to work toward very broad objectives such as critical thinking and tolerance of ambiguity. Operationally, this type of loose agreement translated into several different Little Colleges being offered during any given year. Each instructor had freedom within these broad boundaries to design the course as he chose. The last three Little Colleges have attempted to arrive at greater uniformity among different sections of the course by extensive debate and study concerning alternative packages of objectives. Faculty new to the program are forewarned that concensus with respect to program objectives will be sought. This warning provides a minimal antidote for the uneasiness which results when university professors are required to yield some of their customary sovereignty over course design. This give and take on the part of Little College faculty has prospered as greater care has been taken to recruit faculty members who complement one another.
Little College faculty are not required to perform in some lockstep fashion delineated by Little College administrators. Every faculty member is encouraged to contribute to the formulation of goals, choice of materials, and determination of structure. The major restrictions imposed on the faculty are that the course should be process-oriented and focus on critical thinking skills. Realistically, most of the planning is conducted by faculty who are returning from previous Little Colleges. New faculty members have tended to restrict their role to providing a source of fresh ideas or to serving as friendly critics to the proposals of more veteran faculty. New faculty members have repeatedly voiced their discomfort at being asked to play a substantive role in planning. They have preferred the approach taken in the most recent Little College where new faculty were viewed primarily as learners during their first few weeks in the program.

New faculty in the third Little College were particularly vocal in expressing their dissatisfaction with being placed in a position where they were asked to contribute to major decisions in a state of relative ignorance about possible alternatives. Clearly some balance is advisable. Most new faculty have wished to perform their full share of Little College responsibilities and have been encouraged to do so; but their major contributions must be preceded by several orientation sessions that familiarize them with alternative models of critical thinking.

Each successive Little College faculty has concluded during its summer planning period that its predecessor suffered from too little structure both in curriculum and in classroom activities. This conclusion has resulted from faculty and student perceptions that Little College sections were quite diverse, not just in terms of pedagogical tone and style which we had anticipated and supported, but also in terms of the objectives which were being pursued. In our faculty meetings we would reach eventual agreement on objectives; but unless these objectives were explicitly defined and differences in interpretations of the objectives were discussed, Little College sections did not resemble one another as closely as we thought necessary if the program was to have consistency. Especially during the first three Little Colleges, we were so pleased with ourselves when we reached agreement on objectives at a superficial verbal level that we did not devote enough attention to classroom activities that would operationalize the objectives that we had chosen.

PRESENT FOCUS AND PEDAGOGY

In response to the need for greater structure in the Little College, the 1973 faculty took several steps to improve program efficiency which still persist. To give greater meaning to our intent to focus on critical thinking skills, we attempted to specify in some detail what these skills are and how one recognizes their use in the verbal and written communication of our students. In the course of this process, the faculty agreed that previous Little Colleges had exaggerated their potential impact on student behavior. Since the Little College provided the only opportunity at our university for
students to focus exclusively on cognitive skill development, earlier Little College faculties had attempted to teach more cognitive skills than the students were able to grasp. In response to this realization, the 1973 faculty consciously reduced the magnitude of the criteria which Little College students would be asked to meet. We chose to focus on inferential, deductive, and interpretative skills, as well as on the recognition of assumptions.

Another judgment which we made in 1973 was that a greater emphasis needed to be given to the application of critical thinking skills. The 1973 faculty wanted its students not only to understand certain critical thinking skills but also to be able to utilize these skills in their writing and speech. In other words, we were not satisfied that high test scores were meaningful when we frequently observed that some of the students who excelled in their knowledge of critical thinking skills as measured by the test failed to reflect these skills in their papers and in class discussion. We questioned the worth of teaching student skills which they either could not use or did not know when to use.

Thus, to complement a standardized test, the 1973 Little College created a rubric (statement of objectives) which was applied to essays written by our students. The criteria on the rubric were the following: (1) clarification of ambiguity, (2) use of supporting evidence, (3) understanding of alternative perspectives, (4) evaluation of conflicting arguments, (5) organization of ideas in logical order, and (6) quality of the conclusion. Prior to the fall quarter of 1973, the Little College faculty discussed these criteria, collectively evaluated sample essays, and developed common descriptions of the criteria so that objectives in the various sections would be uniform in more than name alone. It is hoped that this rubric will become our major evaluative tool.

Pedagogical styles used in the Little College are quite diverse. However, there are certain similarities in the daily classroom activities used by Little College instructors. Each instructor assumes that the best way to learn critical thinking skills is by using them. Therefore, we minimize lectures and the use of textbooks which describe the skills we hope to nourish. Most of our classroom time is devoted to exercises designed to focus on a particular critical thinking skill. We use numerous sets of brief conflicting essays to stimulate disagreements and decision-making situations. More lengthy curricular materials are rarely used because students tend to become more interested in the topic being discussed and less interested in the process of critical thinking as they become more deeply involved in the controversy which the essays analyze.

**Evaluative Research**

The evaluative research that has gone on during the Little College has resulted in a considerable amount of data about curriculum and the development of critical thinking skills, and has also taught us much about doing evaluative research in the area of curricular programs. The following
summarizes what our major research findings have been up to this point, and what we have learned about the process of engaging in such evaluation.

MAJOR FINDINGS

The evaluative research on the Little College has neither been uniform in design nor in quantity, but it has always focused on the question: "What increases in critical thinking skills have been achieved by students in the Little College?" We believe at this point our major findings to be:

1. Students in the Little College have achieved gains in the area of critical thinking skill development, and those gains have been significantly greater than those realized by similar students not taking the Little College.
2. Different curricular approaches within the Little College have yielded significantly different results among students in the Little College.
3. Students living together in a common residence hall do not achieve greater gains in critical thinking than students not living together.

Such findings obviously have proven the utility of the Little College in our minds; however, the evidence has not come easily. As noted above, each year's evaluation used a different format and produced different aspects of our findings.

The first two years of evaluative research utilized rather simple techniques: the administration of a measurement to the students before and after the Little College experience. More elaborate plans (e.g., including a control group) were at times made but tended to fall through because of a lack of time necessary to operationalize them.

In the first year, 88 Little College students took the Omnibus Personality Inventory (OPI) during the first and last week of class. Of the 14 scales in the OPI, the faculty of the Little College examined most closely those that centered around the concept of "intellectual disposition," a preference for intellectual activity. Faculty examined increases in this area for different sub-sets of students and found that the group of students (N=28) with the highest tendency for impulsive expression, social introversion, and a low degree of personality integration, and who were easily influenced by others and least able to endure conflict without anxiety registered the greatest degree of increased intellectual activity. While such a finding suggested we were having an effect on the type of student whom we believed most needed to progress in this direction, the data were not entirely convincing because of the small number of subjects and the non-academic nature of the OPI.

The second year of evaluation saw the faculty add to the OPI a standardized test which was to become the primary measure utilized in the following years: the Watson-Glaser Critical Thinking Appraisal, a 100-item, multiple-choice test of critical thinking skills. Although again no
control group was maintained, results from the pre and post tests on the Watson-Glaser for the 165 students in the second Little College were compared to a national sample of liberal arts college freshmen. The average percentile scores for the Little College students represented an increase from the 55th percentile to the 67th percentile of the national sample. It was also found that increases in critical thinking skills varied from section to section, to the point where the average score for one section actually decreased.

The third year brought a revolution of sorts to the evaluation effort. The Little College was placed under a larger unit, devoted to experimentation on achievement-based programs, called the Modular Achievement Program (MAP). The Little College faculty responded to the initiatives of MAP by putting together for the first time an evaluation committee charged with designing a comprehensive evaluation design. The committee members proved to be enthusiastic. They outlined a lengthy set of orientations and skills the student should gain via the Little College and began the task of finding appropriate measurements for each area. Given the multiplicity of objectives, the number of potential instruments became so large as to threaten the time available for teaching activities. Finally, the group agreed upon five measurements including the Watson-Glaser Test.*

A Pretest-Posttest Control Group Design was utilized during this third year. The students in the Little College (N = 198) comprised the experimental group, and students in the control group were selected on a matched-pairs basis utilizing the variables of sex, college, high school decile, and ACT composite score. Despite persistent efforts to maintain a large group, only 64 control group members eventually took both the pre and post tests (32% of the total group contacted). One of the major reasons for this was the number of tests they were being asked to take; it took approximately 4 hours to complete the tests both at the beginning and end of the quarter. However, the students in the control group who did cooperate had a mean GPA of 3.03 for their fall courses, while the mean GPA for students in the experimental group was 2.81. Members of the control group were then academically comparable, if not superior, to students in the Little College.

The results of the Watson-Glaser Test for the two groups showed that there was a greater increase in the mean score of the experimental group than in the control group. The difference between the means on the posttest proved significant at the .05 level (F = 4.30) using analysis of covariance which controlled the initial differences between the two groups on their ACT Composite score and the Watson-Glaser pretest. While the other measures yielded mixed results, none conflicted with the basic finding of an

* The other four were the Omnibus Personality Inventory, a locally-developed test (ANALOGY), and sections of the Remote Associates Test and Torrance Tests of Creativity.
increase in the critical thinking skills as measured by the Watson-Glaser Test.

In general, the third year was found to have evaluation activities demanding too much time of the faculty. Depending upon one's perspective, it was either the high or low point for evaluation activity in the Little College. Everyone involved endorsed the plan for the fourth year of the Little College which was to utilize fewer tests and measurements but a more complex experimental design.

In brief, the fourth year attempted to replicate the findings of the previous year and therefore used another control group matched on the same variables as before. 220 students made up the experimental group (the Little College) and 113 made up the control group. The students in the control group were chosen on a matched-pairs basis using the same set of four variables used in the 1973 design (sex, college, high school decile, and ACT composite score).

Again, the students in the Little College had a larger increase than students in the control group, and analysis of covariance found that the differences on the posttest (Watson-Glaser) were significant at the .01 level (F = 18.93). However, a confounding variable had been introduced. The score on the Watson-Glaser exam was used to determine 25% of the student's grade in the Little College. No such motivation was available for students not in the Little College. In effect then, the intended replication was not carried out; but students in the Little College had significantly higher scores under both conditions, i.e., when the exam was utilized in determining a grade (1973) and when it was not used (1972).

However, the most interesting aspects of the fourth year were investigated by a more complex design which attempted to randomize students in the Little College into two approaches to critical thinking described earlier: IMAGES and the Art of Making Sense (AMAS). At the same time, students were randomly assigned to a common residence or allowed to select their own (disparate residence). This produced a two-by-two factorial design using curriculum and residence as two-level factors as illustrated in Figure 1.

![Figure 1. Two x Two Factorial Design for Critical Thinking Course Approach and Residence](image-url)
Unfortunately, randomization occurred in only 80% of the cases because of student requests not to be placed in the common residence which was a coeducational residence hall. This quasi-random design was maintained as the exclusion of students not placed randomly would have diminished too greatly the number of students in at least two of the four groups. The number of subjects, their mean scores on ACT composite, the pretest, and the posttest, as well as the adjusted mean of the posttest of the Watson-Glaser exam as determined by analysis of covariance for each group is reported in Table 1.

The analysis showed no significant difference as a result of the interaction between curriculum and residence (F = .03), and no significant difference was accounted for by residence alone (F = .003). However, students in the AMAS group did have significantly higher posttest scores than did students in the IMAGES group at the .05 level (F = 4.20).

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<th>GROUP MEANS AND ADJUSTED MEANS FOR 2 x 2 FACTORIAL DESIGN</th>
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<tr>
<td>IMAGES / Disparate Residence (N = 22)</td>
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<td>AMAS / Disparate Residence (N = 27)</td>
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<td>IMAGES / Common Residence (N = 54)</td>
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<td>AMAS / Common Residence (N = 117)</td>
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It would appear then that the more straightforward approach (AMAS) to critical thinking resulted in a greater increase in the students' scores on the Watson-Glaser than did the IMAGES approach. Nevertheless, students in the IMAGES section did score higher and had a greater change in their scores than did students in the control group who took neither course. This comparison was significant at the .05 level (F = 5.13).

The variable of residence in this experiment made little difference in
critical thinking skill development. But it should be noted that most advocates would suggest that the residence grouping did not share the necessary characteristics of an intensive student-centered approach found within a residential college that has become popular and expected when the impact of residence is studied.

The research reported above has provided a research-base on which we hope to build future Little Colleges. There are many more questions to be investigated: Are critical thinking skills developed further during the latter college years? Are the various approaches to critical thinking skill development complementary? What are important correlates of critical thinking skills? Candidly, the designs we have used up to this point do have their weaknesses, but they do approximate reasonableness when one considers the paucity of such evaluative research on university curricula.

**PROCESS OF EVALUATION**

What we learned about the Little College from our evaluation effort may be no more important than what we have learned about the activity and the process of evaluation of curricular programs in general. We have over-evaluated and under-evaluated, have been confused by confounding issues and dilemmas, have been unable to clarify hypotheses, but have always managed to address ourselves to the basic concern, namely, the development of critical thinking skills in college freshmen.

The Little College has always been an experimental program at the University and, in that sense, has offered an opportunity for "action research" in the area of critical thinking. As such, the Little College experienced the dilemma that exists between evaluation in the formative sense (building a program) and evaluation in the summative sense (presenting the outcomes of a program).

Curricular programs exist in a political sphere; and the anxiety created by the tension to achieve a successful evaluation and yet entertain an exploratory mission can be counterproductive. This is especially true when continual demands are made for "positive results" while other programs are safely imbedded in the curriculum without being subject to rigorous evaluation. What can easily happen is that people identify what works and keep doing that at the cost of experimenting in areas that have not been as fruitful or as easy to submit to systematic evaluation.

The program evaluation created other difficulties which ideally should have been avoided but never quite were, and we suggest they may be rather fundamental to all initial efforts in curricular evaluation. These were: (1) change in the curriculum created a difficult dilemma as it would impinge on the previously agreed-upon research design; (2) it is difficult, if not impossible, to match presently available tests and measurements to curricular objectives; (3) faculty, in general, lack experience in such evaluation activities and tend to either overreact or ignore the entire matter; (4) the attempt to offer a comprehensive evaluation can become burdensome when the normal multiplicity of objectives in any academic
course (exaggerated in this one) turns into a game of operationalizing the
identifying appropriate measures for the attainment of each objective
(resulting in evaluation "over-kill").

The Little College has gone through a cycle where evaluation was
clearly a secondary concern to one where it attained primacy as an activity.
Evaluation is, at present, settling into a more appropriate role in which
simplicity of design and directness of questions have been rediscovered.

**Conclusion**

The problem of developing curricula and pedagogical techniques to
help students attain and retain critical thinking skills is indeed both a
complex and a time-consuming one. Nevertheless, Little College data show
that students (first quarter freshmen in this particular case) can be helped
to achieve significant gains in their ability to think critically and that
alternate approaches to developing these skills affect students differently.

Presently available evaluative tools (some highly experimental) attest to
our ability to assess critical thinking skill development. However,
manifestations of such development are complex, and measurements are
often primitive. Leading test agencies (e.g., Educational Testing Service,
American College Testing) have worked primarily to develop valid and
reliable tests in subject matter knowledge. New tools, such as criterion-
referenced tests, analytic performance rubrics, and the "portfolio" ap-
proach, hold promise that has not been adequately explored.

David McClelland, in “Testing for Competence Rather Than for
Intelligence,” suggests that academic tests “predictably do not seem to
correlate with any life-outcome criteria except those that involve similar
tests or that require the credentials that a high score on the test signifies.”
He further suggests that presently available tests and measurements do not
adequately sample or reproduce the type of general critical thinking skills
one needs to perform successfully (2, p. 8).

Another problem area which has troubled every Little College faculty
has been the practice of offering the program exclusively to 150-250 fresh-
men during their first quarter of college. Although our students have always
been self-selected and somewhat more highly motivated than the average
entering freshman at Bowling Green State University, they have ex-
perienced the same adjustment problems that other freshmen go through
while making the transition from high school to college. They frequently
mentioned that it took them several months to recognize that their
academic responsibilities were more demanding than those to which they
had grown accustomed in high school.

The faculty of the Little College recognize that, theoretically, it is
optimal to provide programs in critical thinking skill development as early
as possible in the student’s college career. Then the critical thinking skills
they acquire can be utilized and further developed in the curricular
programs they will go on to pursue. However, the rigors of the Little College
program for incoming freshmen give reason to wonder whether the program offered might prove more efficacious to students who have already adjusted to living away from home and to the greater degree of personal responsibility required of them in college.

These concerns will certainly engage Little College faculty members for the next few years, for they remain committed to the development of critical thinking skills in students, to the continual re-thinking of a curriculum leading to an attainment of those skills, and to the formulation of assessment techniques measuring such attainment. The Little College thus finds itself in the mainstream of what is being called "competency-based learning." We have found that the work in the Little College is quite similar to competency-based learning approaches being developed at other institutions such as Alverno, Mars Hill, and Sterling Colleges, as well as Governors State and Michigan State Universities. Programs at these institutions and others all share the common notion that the attainment of minimally acceptable competency in critical thinking is an essential characteristic of the liberally-educated individual able to lead both a productive and a personally satisfying life in a complex and rapidly changing world.

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