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ABSTRACT

        THREE DISCRETE PARTS OF 2-YEAR COLLEGE RESEARCH ARE
PRESENTED. INSTITUTIONAL RESEARCH IS DEFINED AS PROBLEM AND STUDENT
ORIENTED RESEARCH EITHER GENERAL AND THEORETICAL OR SPECIFIC AND
PRACTICAL, DEPENDING ON THE ABILITY OF THE RESEARCHER. IT CONSISTS OF
SYSTEMATIC AND ORGANIZED FACT-FINDING ACTIVITIES WHICH ARE FOCUSED ON
CURRENT AND PRAGMATIC PROBLEMS, WITH INSTITUTIONAL IMPROVEMENT AS AN
ANTICIPATED OUTCOME. FACULTY RESEARCH IS SEPARATE FROM THE
INSTITUTIONAL RESEARCH. IT ENHANCES INDIVIDUAL FACULTY MEMBERS'
ABILITIES AND ALLOWS FACULTY TO KEEP ABREAST OF CURRENT DEVELOPMENTS
AS WELL AS TO MAINTAIN A HIGH LEVEL OF PARTICIPATION IN THEIR
DISCIPLINE. THE AUTHOR DISAGREES WITH THE NOTION THAT GOOD
UNDERGRADUATE INSTRUCTION AND SCHOLARLY RESEARCH ARE ANTITHETICAL.
STUDENT-COMMUNITY RESEARCH IS DEFINED AS THE COMBINATION OF STUDENT
LEARNING EXPERIENCES WITH PARTICIPATION IN THE SOLUTION OF
SOCIO-TECHNICAL COMMUNITY PROBLEMS. TWO PROPOSALS FOR
STUDENT-COMMUNITY RESEARCH ARE APPENDED, AS IS A 46-ITEM BIBLIOGRAPHY
ON INSTITUTIONAL RESEARCH. (MC)

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# THE TRICHOTOMY OF RESEARCH IN THE

# TWO-YEAR COLLEGE:  INSTITUTIONAL, FACULTY AND STUDENT-COMMUNITY

by

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January 1970

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# THE TRICHOTOMY OF RESEARCH

## IN THE TWO-YEAR COLLEGE: INSTITUTIONAL, FACULTY AND STUDENT-COMMUNITY

by

W. Wayne Scott

PART I. INTRODUCTION

"Progress ..... to be the first law of
nature."

----Stanley Elan

"The wonder is, when you think about
it, how long our schools have managed
to stay the same."

----George B. Leonard (1968)

The oveiall objective of this paper is to present threu discrete parts
of two-year college research: (1) institutional; (2) faculty; and (3) stu-
dent-community. Presentation of these as separate intitites is in no way
intended to imply that there is evidence that they can exist independent of
each other.

Also, the author wishes to make his opinion very clear at this point,
and suggest that the reader keep in mind, that the first and foremost cri-
teria of research in the two-year college is for the benefit of the student.
Student-derived benefits exist at the apex of the decision to participate in
research as described herein.

Brumbaugh[1] has described institutional research as "research designed to
improve institutions of higher learning." Institutional research is thus pro-
blem and student-oriented and can be as general and theoretical or specific

and practical as the competency of the researcher allows. Thus further defini-
tion is to say that institutional research consists of systematic and organized
fact finding activities. These activities are focused on current and pragmatic
problems with institutional improvement as an anticipated outcome.

Faculty research is that research conducted by the faculty, independent
of institutional research, that enhances the individual faculty member's abili-
ties, allows him to keep up with current developments, and maintain a high level
of participation in the life of his discipline. However, it is acknowledged that
the common and widespread belief by many administrators that scholarly research
and good undergraduate teaching are antithetical will continue for sometime to
hamper the acceptance of faculty research in the two-year college.

Student-community research as discussed in this paper is not widely refe-
renced in the open literature. Although, a few authors[2-4] have implied that the
two-year colleges should go out into the community to seek solutions to community
problems, there is little evidence of direct implementation.[+] Student-community
research is defined as the combination of student learning experiences during
their participation in the solution of socio-technical community problems.

Thus from the above, hopefully, it is evident why a position paper is
necessary on faculty and student-community research and maybe not so evident
on institutional research! The "flag-waving" and the "call for volunteers"
to join in institutional research is considered essential due to the fact that
less than 18 percent of our two-year colleges participate in this worthwhile ac-
tivity[5]. If Dr. Salk[*] had conducted his research in the manner that most two-
year colleges conduct theirs, the life giving vaccine would certainly never
have been discovered. Each institution must ultimately become self-sufficient

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[+]The author will make mention in Appendix I and II of this paper of a pilot
implementation on the two-year college level at his institute - Chattanooga
State Technical Institute.

[*]Dr. Salk is the medical researcher chiefly responsible for the development
of polio vaccine.

in its efforts to develop research as a basis for policy-making decisions.

## PART II. INSTITUTIONAL RESEARCH

> " .......... when schoolboys improve by prac-
> tice in the ease of learning by heart, the
> improvement will, I am sure, be always found to
> reside in the mode of study of the particular
> piece ..... and not at all to any enhancement
> of the brute retentive power."
>
> ------William James (1890)

> ".......... Nothing is ever done until every-
> one is convinced that it ought to be done,
> and has been convinced so long that it is now
> time to do something else.
>
> -----F. M. Cornford (1923)

### 1. Backgrounds

Institutional educational research in the United States can be traced back to 1701 when President Mathers of Harvard acted in the capacity of educational consultant to the founders of Yale. However, institutional research is largely a post - World War II phenomenon that was given a big boost from the democratization of education and the sudden availability of foundation money for institutional-studies. These self-studies were embryonic to the idea that a continuing program of self-evaluation might be useful as a way of keeping institutions fiscally sound and educationally awake.

As late as 1960 Palmer Johnson[6] observed, "In a population which is so dependent upon research, it is sad to reflect how few people perceive what it is all about. Research is an approach to a comprehension of the universe along a broad thoroughfare of organized knowledge solidly established on observations

and experiment embedded in a matrix of theory. It is a highway that is con-
tinuously being lengthened, widened and mended." However, Mr. Johnson's peers
were quick to add that part of the highway devoted to education is in exceeding-
ly poor repair, full of holes attributable to amateur workmanship, and breaking
up entirely in spots because of bad engineering and faulty specifications. This
seemingly bad state of affairs is compounded by the facts that (1) fewer than
18 percent of the two-year colleges have formally organized programs of insti-
tutional research and (2) that this 18 percent can claim only an average of 1.1
institution studies per year. These are the same institutions that are supposed-
ly committed to excellence in teaching! So as a field of inquiry, institutional
research, looks something like this: At present it is highly diffuse, probably
because it is still young and still trying to discover its mission in education.
The interest and activities of its practitioners seem to be polarized around
short-run operational research on the one hand and "pure" social science research
on the other. To the extent that this clavage exists, both types of research
tend to be sterile.

The eminent question is thus, What is to be done to attack the mundane
problems that pervade our institutions?

To use Alvin Weinberg's terminology[7] "the task is to eliminate the schism
between those who are 'discipline-oriented' (the faculty) and those who are
'mission-oriented' (the administrators) by bringing them together to define
and work at a problem of common and what ought to be paramount concern to
both: The strengthening of the institution."

Inherent is this plea for educational progress is the belief that insti-
tutional research can provide, or at least should provide, the knowledge needed
to contribute to educational reforms and improvements. However, the reader

should be cautioned that research alone is unable to transform our schools into future Utopias. Research does not exist in a vacuum unaffected by the hopes, aspirations, and limitations of the rest of society. For institutional research to obtain its goals it must be widely accepted and implemented by all.

It should be appropriate at this point to discuss some factors hindering institutional research. If progress is to prevail we should certainly understand our weaknesses from which to improve.

## 2. Factors Hindering Institutional Research

Why have we as educators failed to recognize the importance of institutional research? One possible answer is related to our medieval inheritance of educational conservatism. Like all human institutions it is fundamental to resist change. As a former university president[8] has stated, "........ faculties accept little responsibility for thinking of education as a whole; they pass on specific educational matters without taking the trouble to inform themselves about education in the large, or they refrain."

Although institutional research has been able to make valuable contributions to knowledge about education, it has nevertheless been unable to make the type of contribution which many educators have felt that it should. Thus one can say that educators have extolled the promises of research but have been disappointed in its results. In part, this is due to the fact that much of educational research has been used to evaluate innovations without basic or theoretical knowledge about education in general. There are, however, other conditions that have hindered the progress of educational research. These include the lack of funds for research, the general lack of skill among educators in the methodology of research, the difficulties in bridging the gap between theory and practice in schools, and the willingness of some educators to accept

unreliable or undependable research findings.

Educational research cannot make the progress demanded of it until adequate funds (a very small percent of the institution's operational budget would be considered adequate by most educational researchers) are made available for equipment, manpower and supplies. To be sure, even if sufficient funds were provided, research would still be hampered by inadequately trained researchers and the use of inefficient research designs. Nonetheless, without adequate expenditures for research, the best designs or the best researchers are likely to fail.

One important reason that educational research has not made the contribution educators have demanded lies in the training of researchers* themselves. Competent researchers simply do not develop in a vacuum ----- they must be selected with care and allowed to work and study in an atmosphere which respects intellect and scholarship.

One factor which has retarded progress in education has been the difficulty of implementing educational research in the classroom even where theory exists. It has been estimated that the lag between the production of research findings and the time it takes for these findings to be implemented in schools runs as high as 50 years! With this excessive lag of time, it is little wonder that educators may conclude that research can have little effect on the schools.

The uncritical acceptance of research findings is another factor that has hindered educational progress. The willingness of some persons to unquestioningly accept any conclusion that is part of a research paper has been the source of much difficulty in education. Where data have been poorly collected or where experimental designs are weak, the application of research findings in colleges must, of necessity, be misleading. The uncritical acceptance of research infor-

*It is important to note that a pilot program is being conducted by the College of Education at the Ohio State University for teaching institutional research methodology to undergraduates.

mation has the effect of blinding the student into refusing to question existing beliefs and practices; he will not investigate what is, at least to him, a well-established principle.

## 3. The Methodology of Educational Research

There will not be an effort on the part of this paper to discuss in depth the methodology of institutional educational research[*]; however, it is of concern that some knowledge is imparted to the reader perchance that he is totally unfamiliar with methods of research.

The various research methodology in most common use in our institutions are (1) analytic; (2) descriptive; and (3) experimental.

A number of selected research activities may be subsumed under the heading of analytical research. This includes mathematical, linguistic, historical, and philosophical analyses, as well as any primarily deductive system that can be used to derive relationships not necessarily of an empirical nature. Analytical research helps point out the assumptions and possible consequences of proposed innovations. Analysis may also be used to help establish criteria for the common evaluation of an innovation. One form of analytic research is data retrieval. Its purpose is to gather information from both primary and secondary sources. A primary source is one which has direct access to an original observation. For example, an original manuscript or a report from an eyewitness are primary sources of information. In contrast, a secondary source is one or more times removed from the original observation. By searching the literature, the investigator concerned with innovation can take advantage of the experiences of others engaged in related pursuits.

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[*]Many good textbooks exist in this area (see for example references 9 - 11).

The purpose of descriptive research is to show conditions as they exist without being influenced by the investigator. Descriptive research encompasses a number of different techniques, including correlational analyses, case studies, surveys, and interviews, as well as direct observation. Descriptive research is often of greatest value during initial stages of an investigation. If, for example, educators are concerned about the effects high school dropouts are likely to have on the economy, a first step might be a study to determine how many students leave high school before graduating, what occupations they move into, their salaries, etc. Descriptive research may also help point out the extent of a problem and indicate how serious and widespread it is. Once this information is available the experimental scientist can begin to resolve the problem.

The purpose of experimental research is to study "causal" relationships. It may be used, for example, to study the effects rewards have on learning or to evaluate the advantages of one method of teaching over another.

The role of the experiment in solving the school dropout problem might be to determine which of various proposals to retain students leads to the largest number graduated.

Thus it is evident from the methodology at hand that the total of the administration and faculty are essential for an operational and effective institutional research team.

4. The Chief Administrator's Role

The key to effective administration is the ability of the college president to ask the right questions and find the right answers, a process that inevitably must take into account all the relevant and factual data that only in-

stitutional research can provide. As previously stated research does not exist
in a vacuum unaffected by the hopes, aspirations and limitations of the rest
of society. However, pandemonium surely lurks just around the corner for the
institutional decision makers who rely solely on obtaining knowledge by any
one of the following methods: (1) the appeal to common sense; (2) the appeal to
authority; (3) the appeal to intuition; (4) the appeal to revelation: and (5) the
appeal to reason.

There once was a time when the two-year college administrator could supply
guidance to his institution on the basis of preparation and experience. This
time has passed because of the near overwhelming complexity engendered by an in-
creasing population and a rate of knowledge accumulation which transcends the
imagination.

A recent survey[12] of institutional research practices found that most
college presidents have little knowledge on how research can be used. Not
until administrators and instructors realize its value will properly conducted
research become a fact of two-year college life.

It is essential to any institution that the chief administrator understands
that continued self-study is necessary if the pitfalls of complacency and mis-
direction are to be avoided. Each institution must become ultimately self-
sufficient in its efforts to develop institutional research as a basis for
policy-making decisions.

## 5. Faculty Role

While the direction and development of institutional research rests
primarily with the higher administrative echelons at an institution the
faculty are most often responsible for the implementation and data collection.
If for no other reason than this, the research program must involve and have
the complete cooperative acceptance and participation of the faculty. One

of the attractive features of the two-year college is that faculty are not
confronted with the frustration of progression through the system of "publish
or perish" and thus are free to participate in institutional research.

. However, faculty in two-year colleges have for the most part come from one
of the following: (1) secondary schools; (2) four-year colleges; or (3) directly
from graduate schools. Herein lies some of the problems of acceptance of insti-
tutional research. Institutional research has been slow to start because of the
two-year college's roots in secondary school systems and its own insistence on
being categorized as a "teaching institution". This all points away from insti-
tutional research being a key function. Two-year college faculty often resist
participation in research studies; in some instances they have fled from ..le
university because this activity was required of them.

With regards to faculty, the burden of institutional research rests pri-
marily with the younger instructors coming directly from graduate schools,
i.e., until there is a wider acceptance of institutional research.

Faculty members who are active in institutional research should be aware
of the so-called "fugitive". "Fugitive" indicating that the study has not been
published or if published has been given limited distribution. Faculty should
strive to do worthwhile institutional research and to insure to it's publication.

6. <u>Typical Issues and Problems Suitable for Institutional Research</u>

As previously stated effective administration is the ability of the
college president to ask the right questions and find the right answers. The
three broad problem areas to which institutional research should direct its
attention are: (1) defining institutional goals; (2) determining how effectively
goals are being met; and (3) identifying beneficial and adverse effects.

Some pressing problems[13] of concern to institutional researchers are illustrated by the following questions:

(1) To what extent are students enrolled in programs compatible with their interest, abilities, and preparation? To what extent is talent wasted by poor programing?

(2) Why do students withdraw from college before completing a program? What could --- or should --- be done about it?

(3) What motivates students toward educational objectives?

(4) What evidence suggests that the lives of students are better and more productive as a result of general education requirements?

(5) How can college and community increase their cooperation for the betterment of both*?

(6) Of what value to faculty are such things as fall faculty conferences, student assistants, and seminars in the improvement of teaching?

(7) On what bases are grades awarded? Can those bases be improved?

(8) In what direction does student interest change during their first two years? Is there a relationship between interest change and pattern of courses followed? Specific courses?

It is evident that these questions do not reduce themselves to solutions by appeal to "common sense" or one of the other five previously mentioned methods of obtaining knowledge.

Answers to such problems of paramount nature will require the best of well established institutional research groups.

7. Concluding Remarks With Regards to Institutional Research

While institutional research has increased during the past few years in the two-year colleges, it cannot yet be maintained that the two-year colleges evidence a firm commitment to the findings of research. Much lip service is paid to the institutional research concept as presented by the following statements[14]: "Institutional research is one of the most important things we can do

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*It is important to note that Part IV of this paper speaks to this point.

in an open-door institution," and "Institutional research is our most important staff activity." These comments* are very supportive to the idea of institutional research in our two-year colleges.

The Peterson[15] report lists as the number one problem facing California two-year colleges:

".........measuring the effectiveness of instruction, including evaluation of (1) teaching methods, (2) new methodology, (3) textbooks, (4) library materials, (5) relation of class to educational gain, (6) special facilities, (7) in-service education, and (8) testing devices and the development of guidelines for good teaching."

There is little indication that current research in the area of the two-year college curriculum results in program modification based on specific research findings and recommendations.

For the student, the part of the course which is of vital concern is also the part about which very little research has been done ----- the use, administration and evaluation of the classroom test. Perhaps one reason for the relatively small number of research studies on classroom testing is that both test and course materials are faculty prerrogatives and faculty members do not typically report on their classroom procedure.

Institutional research can be considered successful if it has some effect on institutional practice. It fails when its findings are not put into practice. For example, most research findings indicate that two-year college remedial programs do not achieve their primary objective of remediating student deficiencies, but yet, what two-year institution does not wish to point out its so-called "salvage" program. This is not to say that students do not succeed in such programs, but that the ones who do succeed the salvage program would

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*These statements were volunteered by those participating in institutional research.

probably have succeeded in the regular program! In general, research has not affected the critical instructional areas. One such practice unaffected by research findings is the use of standardized test scores for the placement of the low-achieving student in certain areas such as technical, vocational and remedial.

A final word is that people generally find time and ways to attend to the things that are important to them. The same applies to institutions. Cranfield[16] offers a comparison of schools and hospitals to demonstrate the overall lack of concern or commitment to improve practices.

> "Schools are most like hospitals --- both being characterized by the diagnosis, treatment and evaluation of human needs, one for health and the other for education. Schools differ from hospitals in that every student gets essentially the same treatment method (lecture/textbook), and treatment failures are explained largely on the basis of student (patient) inadequacies. This is a little like saying that our treatments are fine but we keep getting the wrong patients (students). If medical men had failed to persistently research and evaluate their treatments for disease, "bleeding" could have persisted as a standard treatment routine."

Again institutional research is the president's responsibility. The time has passed when he can govern an institution to its goals and objectives without the complete assistance of institutional research. Questions like "Is the generally accepted pattern of administrative organization of the two-year college appropriate to its educational mission?" and "What types of personnel services should be developed in order to best serve the needs of students and to facilitate the educational objectives of the institution?" are questions within his prerogative to ask. These then are examples of the right questions to be asked by the president and he is the man with whom the ultimate responsibility lies. The ultimate responsibility to make sure that his institution indulges in the worthwhile exercise of institutional research.

PART III. FACULTY RESEARCH

".........the future cannot be predicted
but it can be invented."

-----Gabor

1. Backgrounds*

The almost universal statement putforth by administrators in two-year

colleges that "We're interested in teachers, not researchers" is one with

a lot of latitude but little depth and forethought. Somewhere within the halls

of the two-year college lives the widespread belief that scholarly research and

good undergraduate teaching are antithetical.

Two major errors are made by the administrator who either explicitly or

implicitly expresses this attitude. The first error reflects on his background

and a fundamental misunderstanding of research. Secondly, an injustice and dis-

service is being done toward his institution.

Administrators often preclude that more important problems exist within

their institution than faculty research. Upon critical examination of these

problems the administrator will find (probably much to his surprise!) that so-

lutions of institutional problems can best be solved by the very process taught

by scientific faculty investigation. Faculty who are not allowed the privilege

and right to engage in research will either never learn such techniques or will

lose their desire for such (analogous to the fact that an unused limb will cease

to function). The end result being a sterile faculty unable to engage in any

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*The literature review for papers speaking to the subject of faculty research
in the two-year college was almost fruitless, however, two excellent papers
are presented in references 17 and 18.

type of meaningful research whether it be institutional or faculty. The administrator should encourage individual faculty research so as to keep the "research tools" sharpened to their finest edge in order to engage when necessary to do so in the critical tasks that may arise within the institution that only institutional research can solve. Often this research reserve to draw from can be accomplished with no more aid than that of a permissive and supportive atmosphere emination from the office of the president.

Often administrators are known to carry over their obtuse views between teaching and research to the teacher recruitment responsibility. Often is the case when an excellent prospective two-year college teacher fails to respond to an employment offer after being told that within the faculty, research is suppressed to allow for better instruction! Within some administrators lies the "factless" opinion that an instructor who is research-oriented will neglect his teaching or will be unable to communicate effectively with lower division students of heterogeneous backgrounds. This attitude is foremost with education-trained and subject-matter-trained personnel.

## 2. Importance to the Faculty

As stated in the introduction the paramount importance of faculty research lies in the benefits derived by the student ..... undisputedly the central person of our educational system. However, in addition to student derivatives of research the idea is putforth that it is the duty and right of the faculty to engage in meaningful research.

It should be evident without stating, of course, that within this right and duty that faculty will not allow their interest in specialized research to diminish their carrying out of extensive reading and commitment to sharing knowledge with students. Admittedly, it is often difficult in practice to maintain the delicate balance invisioned.

The administration's position on research stands in the front rank of positive correlations to recruitment, morale, professional growth, etc. of the faculty. In the times when industry and government compete with two-year colleges for available teacher candidates the institution deprives itself when faculty opportunities are withheld to participate in creative research. This is particularly so among college graduates with advanced degrees[*] who have been trained to do research and have a strong desire to continue. One of the most frequent complaints heard among two-year college instructors is that the world is passing them by and that their continuance in teaching (without research) places them in the out-of-date category among their discipline. This is over-heard among the scientific instructors[+] more so than any others, who, perhaps not permitted to do research during the year, are exhorted to return to school, industry or workshop during the summers to keep abreast in their fields. If administrators would only consider for a moment the consequences of a faculty member's partially moving (generally to another city since most two-year college towns do not have the big industry that employ physicists, etc.) to another city quite often without their families and subject to the extreme pressure to produce results in only a summer - months time, they would realize that such policies expedite loss of faculty. It is a curious inconsistency for administrators to prate against research for nine months and preach for it the other three! A well-planned, delimed, year-round research plan, reinforced by an enlightened administration, is an inexpensive and fruitful device by which the morale and professional growth of the faculty can be maintained at a high level.

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[*]Few two-year colleges will employ instructors with less than a Masters degree.

[+]A very worthwhile institutional research study would be to determine the average tenure (years of teaching) of scientific faculty such as physicist, chemist, biologist, etc. as a function of two-year colleges that allow faculty research versus those that do not condone research.

### 3. Importance to the Student

Throughout two-year colleges, the spirit of inquiry is suppose to take place within and by the students. Faculty, often for unbeknown reasons, exclude themselves from such worthwhile activity. Working under this erroneous assumption faculty believe that excellence in teaching is only proportional to adequate preparation in educational methods and procedures. The fostering of such impressions clearly voids the essential characteristic of inquiry within the teacher. Teachers of students should be experimenters. To have educated the student within a sterile (non-experimental) atmosphere his first two years and then transfer him into the experimental world of the university shows little forethought in student preparation.

It is certainly worthwhile to examine this so-called "excellence of teaching" that takes place in our two-year colleges. Unquestionably, the two-year college must be committed to this teaching objective. Thus the two parts of the puzzle to be fitted together are the goals of excellence in teaching (one part) and the other part, research. The pertinent question to be asked is "What constitutes excellent teaching?"

Few will debate that excellence of teaching includes an appropriate combination of subject-matter competence with the ability to communicate, knowledge of testing procedures and a genuine interest in people. But above all, effective teaching demands enthusiasm enriched and obtained only through faculty research. Forbes[18] has concluded that "enthusiasm without knowledge is dangerous, and knowledge without enthusiasm is boring."

More fundamental to the above is the fact that only a specialist (a competent researcher) can go beyond the artificially simple concepts of secondary-

level instruction. Intellectual curiosity within the student can only be stimulated by answering student's questions in depth.

So-called "textbook knowledge" can lead to the following incompetencies on the part of the instructor[18]: (1) "sometimes be afraid to expose the students to intensive paperback reading for fear of not being able to cope with that depth of knowledge himself; (2) be incompetent to explore questions or problems in depth, and the better students soon sense this; (3) be unable to use the best textbook in the field because he has reserved that for his own lecture preparation; (4) not be familiar with the literature in the field and thus cannot guide the students to supplementary reading in journals or monographs; and (5) frequently resort to secondary level busy work, to the showing of unnecessary movies or other devices designed to reduce his lecture time to a minimum."

All of us have had an instructor whose lectures are repetitious of the textbook and certainly can conclude that nothing is quite so depressing and boring. Not depressing merely because it is boring but also because the instructor does not possess the training to know if he is making valid generalizations. Textbooks are notoriously poor teaching aids at their best and any instructor without the research training and scholarship sufficient to go beyond the generalities of the textbook is not competent and qualified to be an "Aristotle".

4. Importance to the Institution

The reputation and esteem of an institution can be greatly enhanced by the faculty researcher. He can be pointed to with pride by the administration and his accomplishments can be used to combat the injurious idea that two-year colleges are often institutions of inferior learning experiences of relevance.

There are few among us that would argue against the importance of faculty research that (1) is student oriented; (2) contributes to the professional literature; (3) brings grant money to the institution and (4) provides the leadership which a two-year college should possess for the community.

In conclusion, the two-year college must be permissive and supportive of the research competencies of the faculty so that they may participate actively at the frontiers of their respective disciplines. A "pedagogical hack" who perpetually digests and regurgitates other peoples' ideas without adding substance to them should not be the role of the faculty. Let the teaching machine perpetuate that role and leave far more important functions to the instructor.

### PART IV. STUDENT-COMMUNITY RESEARCH

"Our schooling largely evades serious consideration of the deeper issues of social life .....
the effective education, that which really leaves a stamp on character and thought, is obtained when graduates come to take their part in the activities of an adult society."

------John Dewey (1930)

### i. Backgrounds

In 1930, John Dewey was critical of our social philosophy that was geared to a world of scarcity. Man's most urgent drive was bent on gratifying basic material needs ........ to solve problems relating to the allocation of scarce material resources. Self-interest, proclaimed DEWEY[19], in terms of gratifying material wants, was the major motivating force of human behavior. "Natural rights", particularly property rights, were viewed as more important than social

responsibility and service to the community. "Values we equated to price, and
we learned to bestow higher rewards upon the manipulators of money than upon
teachers of our children[19]."

In the year of 1969, if one looks about he recognizes that realities
are changing. We are the first society in the history to reach the age of
abundance. With our unprecedented explosion of scientific and technological
know-how; with computers still in their infancy; with the Keynesian tools of
fiscal and monetary policy ........ we begin to realize at last that we have the
means for a massive and final assault against poverty and its cultures.

The leadership requirements for our social reconstruction will quite
assuredly not come from such existing agencies as the Pentagon, Capitol Hill,
the business community, the labor movement or from public, private and volun-
tary agencies. These potential leaders are busily engaged in countless brush
wars and minor skirmishes against the symptoms of social problems. And few of
these realize that they are applying the "tired" theories of defunct economists
and philosophers to problems that will be solved only by applying new theories.;
that will have to be attacked through new social institutions. WEINBERG[2]
contends the educational services which society must have are community agents
to attack social problems. Social problems not solved within the community
suffer from federal legislation for control which in themselves serve no so-
lutions. Thus it is contended that mission-oriented, multidisciplinary two-year
colleges (that exist within community bounds) must attempt to apply "technological
fixes" to the existing problems.

A prototype of a "technological fix" is the safe automobile. Traffic
safety, until recently, has been viewed primarily as a social problem. Laws were
passed and enforced, drivers were educated, safety campaigns were launched, and
yet the traffic toll remained high. Ralph Nader's argument ----- that it is

easier to improve the car (a technological problem) than it is to improve the
driver( a social problem) ----- has a kind of transparent logic that is appealing.
As NADER has said, he is concerned with remedies rather than with causes: if one
can significantly reduce the number of traffic fatalities by improving the car,
even though drivers continue to drive imprudently, this would migrate the social
problem to traffic fatalities.

It is agreed that to the social purist there is something repugnant about
achieving remedies by such "tricks" without at the same time rooting out the cause
of the social ill.  In a sense, however, no social problem is ever completely
"solved", except over the very longest period.   Were we to wait for the process
of education to improve individual conduct to the point where a social problem
is eliminated by individual action, we would have to wait much too long.  Moreover,
the technological approach, through improving the car, by no means precludes
campaigns for driver safety or better enforcement of traffic safety laws; nor does
it exclude other technological approaches, such as improving highways or traffic
control systems.

Many problems that are traditionally viewed as being primarily social
possess stronger technological components than one first suspects.   They there-
fore may admit to technological palliatives, or even "fixes" which hopefully can
buy time to get at the cause of the problem.   Such bought time is to be spent
by student-community research centers within our two-year colleges.

## 2.  The Socio-Technical Two-Year College

Socio-Technical Two-Year College is the name given to the institution that
is to accommodate the academic and community environment for conducting student-
community research.  Peers of such an institution are sure to exclaim the follow-
ing two statements:  (1) the proposed institution is not encompassed in our pre-

sent two-year college philosophy ..... and (2) students at this level are in-capable of solving problems of any degree of complexity.

. With respect to the first statement, REYNOLDS[20], has said of the two-year college, "the relationship between the implications of stated philosophy of the educational program and the program itself is not always consistent." COHEN[3] has concluded that within each of our communities, the two-year college can help contemporary society ..... not by perpetuating the forms of the past, but by designi..g and implementing new thrust in education. Certain limitations in edu-cational planning are always apparent but such limitations have yet to be ex-ceeded in America.

Only time itself can disprove or prove the relevance of the second state-ment. However, persons examining closely the capabilities of our present day two-year graduate (especially graduates of our two-year technical institutes) as compared to his counterpart ten-years ago will be quick to admit that the next ten-years may very well catalyst the socio-technical two-year institution as proposed.

## 3. Conceptual Base of Student-Community Research

The idea of student-community research is based on the following three primary principles[4]:

PRINCIPLE I: "Education is irrelevant unless it ful-fills its function as society's instrument for con-tinuous, constructive self-criticism and social change."

PRINCIPLE II: "Education should help students to gain a theoretical framework of values and ideas, and scientific habits of thought and action ..... so that future social entrepreneurs, legislators, scientists and educators ..... they may better under-stand, control and improve their natural-social en-vironments."

PRINCIPLE III: "Educational institutions will
fulfill neither of the first two principles un-
til they eliminate the narrow, restrictive, dis-
ciplinary boundaries."

Knowledge without the understanding of relationships is superficial; and
the relationships of paramount importance are those between man and nature, man
in his natural and social settings. However, no meaningful relationships and no
problems are so obliging as to graciously fall within the limits or boundaries
of any single discipline. So long as the comprehensiveness of all things; so
long as we continue to departmentalize with sharply defined and delimited spe-
cialties within specialities; we shall continue to graduate men and women who
accept rather than question old values and assumptions ..... who are alienated
from the realities of our present time. Few students can tie fragments of know-
ledge into a meaningful whole; into a framework for understanding his community
without direction from his teacher. As educators we can perhaps eliminate such
fragmentation by curriculum development in certain areas, especially in the
two-year college. Such development is not to be built around disciplines but
around community questions and problems*.

This socio-technical two-year college of the future will have learned
that both the best teaching and learning occur in the course of research involve-
ment. This research, however, is to go beyond opinion surveys, participant-ob-
servation or other techniques which limit themselves to the accumulation and
classification of data ...... the description of what is.

The scientific method is the common experimental methodology being sug-
gested here. The major objective being laboratory experimentation in which
scientists ask questions, select a problem; obtain, analyze and evaluate data;

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*Refer to Appendix I and II of this paper for talks presented by the author
relating to the solution of community problems through student-community re-
search.

predict the consequence of data changes; choose a course of action; and use symbolic tools to simulate actual conditions and test selections made. A laboratory environment of this type* consists of students with similar education aims and backgrounds apprenticed to small groups of faculty with related but varied specialities. Together students and faculty will attempt to solve real problems of real environment, both natural and social ..... whenever possible linking the two. The students working as scientist with scientist, conceivably will have a voice in the selection of projects.

As an illustration consider a problem with a group of students and scientists in the health and medical field. The community research problem could be the improvement of medical and health facilities in a ghetto of an urban city. Using the scientific method much data could be made available by our institution to decision-makers, to those responsible for health and medicine in the ghetto. This educational approach would not allow the students to go off in all directions. Faculty still have the major responsibility of introducing or directing the student, at the appropriate times, to the essential data and the theory from each of the disciplines involved. A theoretical framework must be developed, a framework which expands as new data and theory is introduced. The students work with the theory, use it, link it to what they already know, and apply it to the problems of the community. The importance of this learning experience being that the student relates theory to practice, concentrate on connection and develop the most important habit of the learning process ....... the ability to place objects and events in new relationships. In course study of this nature the student also becomes familiar with such tools as statistical skills. But in learning statistical theory for example, he will not be dealing

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*Refer to Appendix II of this report.

with the subject matter in the abstract. Application will be made of the theory, immediately and directly to obtaining and evaluating data referring specifically to the community under study.

The process of learning through student-community research is certainly more exciting than the possible absorption of facts and ideas as disseminated in lectures or discussions. This is not to imply, however, that every subject or area of study can or should be taught in this manner. Nor does it mean that student-community research participants will not attend lectures, take their part in discussions, use learning machines, or read books. It does mean that the year's reading, writing, listening and discussing will be of greater value. It will be participation for research activity; means to the data and ideas pertinent to the students' project. Finally, such community projects are the beginning, not the end of learning. They provide the breadth and scope necessary for the student to become broad-gauged ..... before he becomes a specialist; and when the time arrives for him to select his area of specialization, he will be able to draw upon an experience which involved him in the material and meaning of many disciplines.

There are many advantages to be gained through the student-community research approach, four of which are to be briefly discussed in conclusion of this section[4].

First it cuts down on the artificial and destructive barrier that has been built between teaching and research. Faculty will view students not as deterrents of their more important and more profitable research time, but as apprentices who contribute significantly to research. The students will not learn through absorption and regurgitation, but in the same way scientists have always learned .... in the process, the act of discovery itself.

The second advantage is that faculty will be forced to broaden its scope. No longer will it be possible for specialists to limit their reading and talking to their own alter egos, and to continually repeat the same errors. It is easy for a narrow specialist to maintain his myth of value neutrality when his only serious intellectual contacts share his discipline, his values, and his myth.

The third advantage of this method is that it developes a sense of "community". Administrators, faculty and students become participating members rather than managers, employees and products of the bureaucratic organization. No matter how large the school, the method narrows it down to small, manageable groups of individuals, working cooperatively, and sharing common goals. Gone is the impersonality of the multiversity. The participants all share the responsibility for the task that be ahead. Their community, however, is not the community of a monastic order. The school takes its problems and its data from the broader community. In turn it gives the community that which only education can give ..... valid thoery to direct the course of social action. In other words the socio-technical two-year institution becomes relevant. It becomes the source of our needed social reconstruction.

Peers may be quick to point to the fact that education is indeed involved in community research as consultants to government, business and labor and through their research they make major contributions to social action. True, but they are not their own masters. It is their employers or grantors who ask the questions and decide what problems are to be solved.

Finally, the fourth and final advantage. The method helps to devel op commitment to society and social goals. It is therefore an attack upon that malignancy which plagues modern man ..... the boredom and cynicism which we call alienation.

This approach described to you in this necessarily sketchy manner, has been tried[*], with some success ..... admittedly on a very modest scale. It is clear that the author has left many questions unanswered and many details to be worked out. There is room for improvement ..... improvement that you the educator will make.

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[*]The author has recently implemented on a very modest scale a pilot program through which several community socio-technical problems have been solved. (Refer to Appendix I and II for introductory comments made to community and faculty.)

APPENDIX I: Talk to Engineer's Club

SURVIVAL PROBLEM FOR EDUCATIONAL INSTITUTES

by

W. Wayne Scott

Chattanooga State Technical Institute

Educational administrators and professors at Chattanooga State Technical Institute have some strangely non-educational concerns at first glance these days.

They are worried about transit and traffic flow problems and the prospects of developing a pollution-free electric automobile and those with anthropologistic minds desire to study the attitudes of college students toward the threat of World War III.

These activities, and many more, are part of Chattanooga State Technical Institute's far-ranging pipe dreams for betterment of the community that we live in. One possible panacea for urban clutter and congestion: construction of "utility tunnels" that would bury electric and gas lines beneath city streets and provide thousands of parking spaces.

## OTHER BROAD PROBLEMS

Although such visionary schemes may never be carried out, they demonstrate how a "mission and problem solving" oriented college could fruitfully tackle new tasks when its original mission neared accomplishment. This is not to say that somewhere along the spectrum of educational development that we at Chattanooga State Technical Institute cease to become educators and become research philosophers, however, it can be said that CSTI has the responsibility and indebtedness to its financial backers (taxpayers) to apply its technical expertise to other broad community and state problems. Besides attacking urban ills, efforts should

APPENDIX I (Cont'.)

be putforth to lend engineering and scientific aid to the medical profession and to political and industrial complexes in the Chattanooga and state wide areas. New means must be derived for producing potable water from our already contaminated rivers.

## LARGEST PROBLEM OF ALL

.Chattanooga State Technical Institute is also attacking a more mundane problem that pervades our scientific educational institutes:  Obsolescence.  Simply stated, its the failure of many colleges to adjust to the community's changing industrial and technical requirements.

Whether through bureaucratic inertia, legal limitations or lack of imagination, colleges often work on problems already solved or no longer urgent.

It is proposed that CSTI include in its structure a "mission-oriented, problem solving", departmental mechanism for educating by the process of "total submersion" of the student.  It shall be the goal of such a "complex" to rid ourselves of "educational obsolescence".

## PROTOTYPES FOR THE FUTURE

Achievements at CSTI could provide a prototype for the truly "regional" educational institute of the future - an educational facility capable of educating students and capable of conducting a broad range of meaningful research activities.  This is to say that the CSTI (complex) will continue to perform pre-eminent educating functions but will venture well beyond all initial state prescribed purposes.

APPENDIX II: Talk to CSTI Faculty

<u>Science and Engineering Technician Practice School</u>

(Departmental Mechanism for education by the process of total submersion)

W. Wayne Scott

Chattanooga State Technical Institute

OBJECTIVES:- Cross-breeding of technicians
- Reports from CSTI
- More students can benefit by association
- Team efforts
- Inter-departmental exercises
- Money from output to be used to finance labora-
  tories and scholarships
- Excellent means of school-industrial relations
- Faculty improvement
- Student improvement
- Socio-technical problems

The practice school will provide students (and faculty) a challenging op-
portunity to apply their academic backgrounds in engineering and applied science
to practical problems of current and pragmatic interest to the Chattanooga State
Technical Institute and surrounding community. Students are to work as members
of a team on a series of significant problems whose solutions strengthen their
training as well as provide purposeful contributions to the "school" and communi-
ty. The program is to be under the direction of the faculty in cooperation with
all the staff.

A typical problem of study in this local area might very well be the study
of plume rise and its relation to stack design. This problem involves students
with backgrounds in mechanical, computer science, electrical and nuclear, respec-
tively. The output of this problem could very well be the obtaining of empirical
formulas relating plume rise data to the independent parameters of effluent velo-
city, horizontal wind velocity, heat emission rate, and atmospheric conditions.

APPENDIX II (Cont'.)

In addition to the theoretical aspects of such a plume rise problem both experimental and design problems can be assigned.

Another typical experimental problem could be the determination of mass transfer from a rotating sphere. Students with backgrounds in nuclear, civil, mechanical and chemical, respectively, could effectively participate in this project. The mass transfer of a rotating sphere is a function of rotational speed, gas velocity past the sphere, and the orientation of the axis of rotation.

Still another project could be the study of irradiation of solids (strength of materials) and electrical elements (conductively, etc.). These are simple experiments with good output and little additional materials needed.

Academic credit should be given for practice school participation.

It is anticipated that students can work on several problems during the practice school and students are regrouped after each problem allowing each student to work with many others representing a wide variety of academic disciplines (one of the most important aspects of the practice school).

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