

CHEMICAL EDUCATION PROGRAM

at

THE UNIVERSITY OF TEXAS

Come Build The Future With Us

What is chemical education?

Chemical education is a discipline that springs naturally from the recognition of three important observations:

- chemistry is the central science**
- chemistry is useful to the evolving progress of civilization**
- our understanding of chemistry is not, and probable never will be, complete**



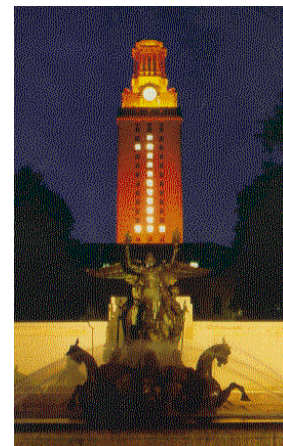
Why are we all interested in chemical education?

EVERYONE

teaches

learns

trains



The degree program

FLEXIBLE

graduate level chemistry

graduate level education

Statistics

Psychology of Learning

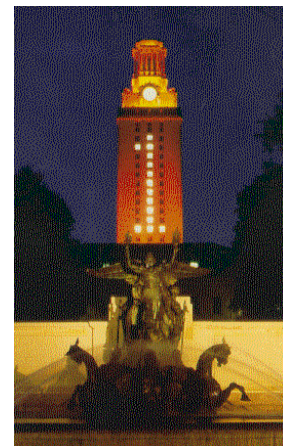
Instructional Technology

Research Methods in Education



What is the program designed to develop?

- train students in the design, development and execution of “good” experiments”
- identify questions that pertain to the learning of chemistry
- propose experiments to address those questions
- accomplish *scholarly* work



What is scholarship?

“In addition to discovery research, scholarship in the chemical sciences and engineering includes the integration, application, and teaching of chemical sciences and engineering principles and practice. This expanded definition recognizes that valuable scholarship in any of these areas requires originality, creativity, a thorough grounding in the previous accomplishments of other scholars, and effective communication of new contributions in peer-reviewed publications.”

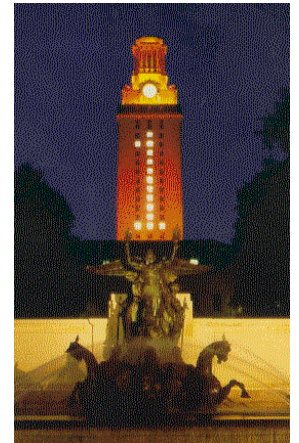


American Chemical Society

DISCOVERY

“The scholarship of discovery, at its best, contributes not only to the stock of human knowledge but also to the intellectual climate of a college or university.”

Scholarship Reconsidered
Priorities of the Professoriate
Ernest Boyer



INTEGRATION

“..... serious, disciplined work that seeks to interpret, draw together, and bring new insight to bear on original research.”

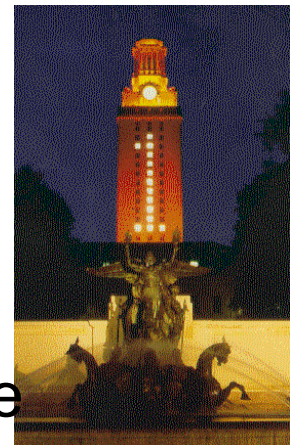
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APPLICATION

“.... the application of knowledge moves toward engagement as the scholar asks, “How can knowledge be responsibly applied to consequential problems? How can it be helpful to individuals as well as institutions?””

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TEACHING

“The work of the professor becomes consequential only as it is understood by others?”

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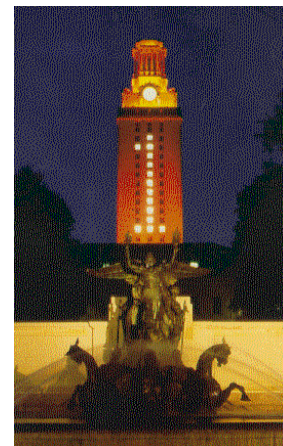
Chemical education research can fall into any one or more of the definitions of scholarly work.

Discovery

Integration

Application

Teaching



RESEARCH

What kind of research is chemical education?

It should answer questions of....

What should we do?

Who do we do “it” to?

How can we do “it”?

Does “it” work

Why does “it” work?

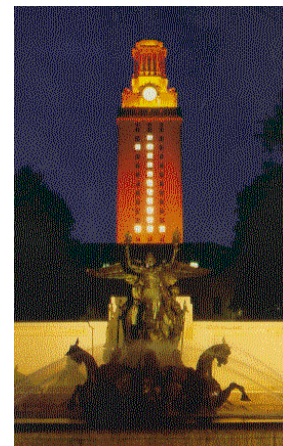
always utilizing good experimental procedures



Chemical versus Science

Education? FOCUS and DIRECTION

Chemical education is focused on the specific nuances of chemistry and how educational theories apply to chemistry education.



For example.....

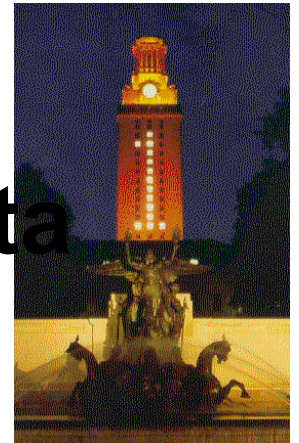
CH204 AV and Cognitive Apprenticeship

- **multidisciplinary**
- **teaching students the practice of chemistry**



TECHNOLOGY

- **a major focus of our work**
- **engages students on an individual basis**
- **route to active learning**
- **collection and analysis of data**



SKILLS

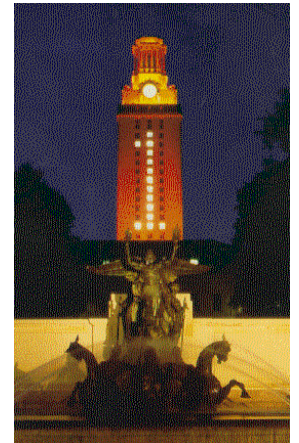
- an understanding of educational pedagogy and methodology
- an understanding of education theory
- an understanding of education research
- an understanding of the use of technology in education

As it applies to the teaching of chemistry.



CURRENT RESEARCH

- **ASSESSMENT AND EVALUATION TECHNIQUES**
- **MULTIPLE INTELLIGENCES**
- **LABORATORY AND LECTURE**
What good are they?
- **GAMES AS LEARNING AIDS**
- **PROBLEM BASED LEARNING AND CONSTRUCTIVISM**
- **PEER TEACHING ASSISTANTS**
- **DISTANCE, ON-LINE AND WEB-BASED EDUCATION**



FUTURE RESEARCH CONSIDERATIONS

- **CONCEPT MAPS**
as learning tools
as assessment tools
- **ASSESSMENT IN DISTANCE EDUCATION**
- **INDIVIDUALIZED COURSEWORK**
- **THE “*ULTIMATE*” HOMEWORK AND QUIZZING SYSTEM**
- **AND MANY OTHERS.....**



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