Bridges to Our Bright Future

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The Student Research Landscape in Doctor of Pharmacy Programs

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The University of Arizona
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Introduction

• Research-related coursework and the development of research related skills can enhance the professional vitality of pharmacists and help ensure that they will be better prepared for lifelong learning and capable of dealing with changes in science and practice.
Introduction

• Early exposure to research-related coursework and research experiences may serve to interest students in research or get them to a level of comfort with conducting or evaluating certain types of projects
Introduction

• Conducting research during residency training is strongly recommended by the American Association of Colleges of Pharmacy (AACP) to help develop future faculty
Background

• Kirking first published a study in 1988 describing the role of research in the education of doctors of pharmacy

• There was considerable variation in extent of research-related courses and experiences among different types of PharmD degree programs

Kirking DM. The role of research in PharmD education. AJPE. 1988;52:131-4.
Background

• A follow-up study in 1997 found most colleges required coursework in research methods, biostatistics, and drug information & literature evaluation.

• Students had opportunities to conduct research as an elective in 41% of the responding programs.

• Only 12.9% required extensive project (data collection, analysis, and write-up).

Background

- 10 years passed before the next follow-up
- Many new colleges created
- Existing colleges increased class size to meet the pharmacists shortage
- Considerable shortage of faculty
- All colleges offer PharmD exclusively
- The mission of the pharmacist had continued evolving with greater emphasis on providing evidence-based pharmaceutical care
Objective for 2007 Study

• Provide first evaluation of role of research-related coursework and research experiences in entry-level doctor of pharmacy programs in the U.S. since the conversion to PharmD as the first degree

• Compare findings to previous two studies

Methods

• Questionnaire mailed to 88 colleges and schools of pharmacy

• Information sought on formal research-related coursework, required and elective research experiences; and perceptions of student-conducted research
Results

• 88% response
• 91% required coursework in statistics
• 94% required coursework in drug information/literature evaluation
• 53% required coursework in research methods
## Coursework Comparison – 1st Professional Degree Programs

<table>
<thead>
<tr>
<th>Required Coursework</th>
<th>2007</th>
<th>1997</th>
<th>1988</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research Methods</td>
<td>53%</td>
<td>54%</td>
<td>50%</td>
</tr>
<tr>
<td>Drug Information/Literature Evaluation</td>
<td>94%</td>
<td>98%</td>
<td>78%</td>
</tr>
<tr>
<td>Statistics</td>
<td>93%</td>
<td>93%</td>
<td>100%</td>
</tr>
</tbody>
</table>
Results (2007)

• 57% offered elective research experiences (vs. 41% in 1997)

• 25% required some form of research project

• 15% required all components of a project (vs. 13% in 1997)

• 18% did not provide research opportunities
## Research Availability by Type of College/School

<table>
<thead>
<tr>
<th>Required(^a)</th>
<th>Elective(^b)</th>
<th>None</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public/Private</td>
<td>8/12</td>
<td>35/10</td>
</tr>
</tbody>
</table>

\(^a\) Any form of required research

\(^b\) Though some programs with required research also provided research electives, this category includes only those programs with electives as the sole offering
Elective Research Uptake

• Few students take advantage of elective student research experiences
• Most respondents (35 of 45; 78%) with electives estimated <10% of students participated prior to graduation, though 2 thought >50% of students completed an elective project
Study Types Allowed

• Students completing research projects that required data collection and analysis \( (n = 12) \) were allowed to collect data from chart reviews (11), surveys (11), databases (11), interviews (10), clinical measures (10), laboratory procedures (9), and direct observation (8). Half of the 12 allowed students to use systematic reviews (e.g., meta-analysis).
Barriers Identified (2007)

- Primary barrier = lack of resources
- Impossible to provide a research experience to large numbers of students
- Lack of faculty time for mentoring
- Lack of curriculum space
- Faculty inadequately trained
- Five opposed a project requirement - “inappropriate for professional students and such training should be reserved for graduate programs”
Other Studies and Opinions
ACCP – The Essential Research Curriculum for Doctor of Pharmacy Degree Programs  Pharmacotherapy 2010;30:344e-349e

• Eight key competencies
  – Identifying relevant problems and gaps in pharmacotherapeutic knowledge
  – Generating a research hypothesis
  – Designing a study to test the hypothesis
  – Analyzing data using appropriate statistics
  – Interpreting and applying results of research to practice
Eight key competencies (continued)

- Effectively communicating research to pharmacy, medical, and basic science audiences
- Interpreting and effectively communicating research and clinical findings to patients and caregivers
- Applying regulatory and ethical principles when conducting research or using research results
Elective Research Course

• 2 hour elective in clinical research
• Students taking elective (vs. not) had:
  – greater familiarity with research-related topics, training options, and career opportunities
  – greater interest in pursuing a career in clinical research
Impact of Research and Publication on Students
Nykamp D, et al. AJPE 2010; 74 (3) Article 47

• Students thought the activity provided value as personal fulfillment and an opportunity to contribute to the literature
• Increased interest in a career in academic pharmacy
Project Preceptor’s Views

Kao DJ, et al. AJPE 2011; 75 (1) Article 5

• Characterize dissemination of findings and views of advisors about required projects
• 88% thought projects a valuable learning experience for students, of value to them professionally (82%), and to institution (78%)
• Project dissemination
  – Institutional forums – 47%
  – Poster presentations – 24%
  – Platform presentations – 4%
  – Publications – 5%
Barriers for Faculty Research


• Insufficient time was primary identified barrier for PP faculty (57%)
• Need exists to be able to identify a research question and how to answer
• Only 32% thought scholarship should be required (obvious barrier to student conducted research)
• 41% thought importance of scholarship overemphasized (obvious barrier to student conducted research)
Student Perceptions
Kim SE, et al. Perceptions of required senior project. AJPE 2010; 74 (10) Article 190

- 88% thought (agreed or strongly agreed) that project was valuable learning experience
- 73% though it provided competitive advantage for postgrad job opportunities
- Those planning a residency or fellowship more likely to think it made them more qualified/marketable
The Need for More Research Based Courses in the PharmD Curriculum

Dutta A. AJPE 2011; 75 (5) Article 102.

• Limited number of graduates entering MS and PhD programs – opening opportunities for PharmDs to compete for research positions in academia and industry

• “Pharmacy faculty… should look at ways by which we can increase the research exposure of our PharmD graduates…”
Research Skills Training in US Schools of Pharmacy
Fuji KT, Galt KA. Int J Pharm Pract 2009;17:115-21

• 79/95 responses
• Most (75%) do not require completion of a project
• Majority of research skills listed on questionnaire were covered by >50%
• No significant difference by school type
• Schools requiring a project provided the most comprehensive research skills training
Barriers Identified (Speakers)

• Split campus
  – 2 IRBs with different requirements (different training, different format online vs. paper)

• Using adjunct faculty
  – IRB training/may not be eligible for PI status

• Communication
  – Harder when physically distant

• Faculty and student buy-in
Barriers Identified (Speakers)

• Belief by some that practitioners should not be involved in research
• Lack of pedagogy related on how to best mentor students through the process and related learning needs (e.g., providing structure for the process)
• Resources
• Increasingly difficult IRB procedures
Conclusions

• 2007 study showed the variability in extent of research coursework and research experiences in PharmD programs

• Most colleges require coursework in areas that support research understanding

• Other authors have identified both positives and barriers
Where to From Here?

• How can programs overcome barriers and provide opportunities for students?
• What is the cost/benefit of doing research for faculty and students?
• What is the long-term impact on students?
• What are “ideal” methods for training individuals in research skills at this level in their careers?
Promoting Scholarship Skills in Pharm.D. Students: The Michigan Experience

Frank J. Ascione, PharmD, PhD
Professor and Dean
University of Michigan
History of UM Program: Historical Perspective

- First started as a chemistry lab offered to pharmacists in 1860.
- Organized as a department in 1868 and 1876 as a College.
- First to emphasize science based curriculum for pharmacy graduates vs. traditional apprenticeship system.
- Dual mission of research and education.

• Pharm.D. Program
  – Post BS
  – Small class size (8-20 students annually)
• Initial faculty composition/attitudes
  – Faculty were primarily basic scientists
  – Requirement advocated by faculty
  – Viewed as graduate program
• Requirement characteristics
  – Course work: biostatistics; scientific literature evaluation
  – Project: 12 months; no formal review/monitoring process
• Project mentors
  – Primarily by pharmaceutics faculty with a significantly increasing minority mentored by tenure track clinical faculty

• Pharm.D. Program
  – Pharm.D. as the terminal degree
  – Class size increased for 35-55 annually
• Initial faculty composition/attitudes
  – Majority: clinical and social & administrative scientists
  – Debate focused on concerns about purpose/workload
• Requirement characteristics
  – Course work: statistics; scientific literature evaluation; research methods/proposal writing
  – Project: 18 months; formal review/monitoring
• Project mentors
  – Split between clinical (tenure track)/social & administrative sciences and basic science faculty
History of UM Requirement: 1997-2010

- Pharm.D. Program
  - Pharm.D. as the terminal degree
  - Class size gradually increased to 80 annually
- Initial faculty composition/attitudes
  - Majority: clinical and social & administrative scientists
  - Significant opposition to requirement: concerns about purpose/workload/effectiveness
  - Data from alumni survey overcame faculty opposition
- Requirement characteristics
  - Course work: statistics; evidence based medicine; research methods/proposal writing
  - Project: 18 months; formal review/monitoring
- Project mentors
  - Primarily social/administrative sciences & (all) clinical faculty
History of UM Requirement: 2011-?

- Pharm.D. Program
  - Pharm.D. as the terminal degree
  - Class size expected to be between 80-85 annually
- Initial faculty composition/attitudes
  - Majority: clinical and social & administrative scientists
  - NO SIGNIFICANT opposition to requirement
- Requirement characteristics
  - Course work: statistics (pre-pharmacy); evidence based medicine; research methods/proposal writing
  - Project: 18 months; refined review/monitoring
- Project mentors
  - Expected to be primarily social/administrative sciences & (all) clinical faculty but increasing number of basic scientists.
Research Program Objectives

• Primary
  – Introduce student to scholarship and the scientific method
  – Provide opportunity to participate in research and enhanced faculty mentoring

• Secondary
  – Enhancing student analytical/problem solving skills
  – Enhancing student writing skills
  – Exposure to research/innovation in pharmacy practice
Pharm.D. Project Components

• **Selection of advisor**
  – Student initiated
  – Should be done by the beginning of P3 year
  – Advisor must be approved faculty member
  – Non UM faculty can be used under special circumstances

• **Preparation of proposal**
  – Review by committee
  – Focus is on practicality, level of student involvement and scope of project
  – Scientific merit usually not assessed
Pharm.D. Project Components (continued)

• Implementation of research plan
  – Must be original research on any topic related to pharmacy or health care
  – Can be part of group effort but individual contribution must be clear

• Completion of research
  – Final report required-standardized manuscript format
  – Publication and presentation of results encouraged
Alumni Support: Survey Methodology

• **Purpose**
  – Need to evaluate value of research program
  – Determine what changes are needed

• **Survey population**
  – All individuals who graduated from UM from 1987-1999
  – Represented Pharm.D. students educated on refined single degree curriculum

• **Total sample**
  – 560 students
  – 408 respondents (73%)
Key Results: Endorsement of Requirement

• Should college keep research requirement?
  – 82% indicated yes

• Enhanced career development
  – Chance to closely work with faculty
  – Opportunity to improve scholarship-related skills such as writing, problem solving, creativity

• Improved marketability
  – Unique educational experience
### Key Results: Mentoring Relationship

<table>
<thead>
<tr>
<th>Advisor Characteristics</th>
<th>Description of Advisor (1=not true; 5=true)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Was approachable</td>
<td>4.6</td>
</tr>
<tr>
<td>Gave helpful feedback</td>
<td>4.5</td>
</tr>
<tr>
<td>Listened to me</td>
<td>4.4</td>
</tr>
<tr>
<td>Positive toward effort</td>
<td>4.4</td>
</tr>
<tr>
<td>Acted respectfully</td>
<td>4.4</td>
</tr>
<tr>
<td>Supportive</td>
<td>4.3</td>
</tr>
</tbody>
</table>
Key Results: Effect on Skills (% Stating Helpful)

<table>
<thead>
<tr>
<th>Courses</th>
<th>Writing skills</th>
<th>Problem solving skills</th>
<th>Attitudes toward research</th>
<th>Future research performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Statistics</td>
<td>16%</td>
<td>58%</td>
<td>54%</td>
<td>67%</td>
</tr>
<tr>
<td>Research methods/proposal writing</td>
<td>69%</td>
<td>84%</td>
<td>84%</td>
<td>84%</td>
</tr>
<tr>
<td>Scientific Literature Evaluation</td>
<td>77%</td>
<td>85%</td>
<td>84%</td>
<td>87%</td>
</tr>
<tr>
<td>Project</td>
<td>85%</td>
<td>86%</td>
<td>86%</td>
<td>85%</td>
</tr>
</tbody>
</table>
Suggested Educational Model (Gaither, Ascione, Kirking)

Prior research interest and experience

Structured scholarship curriculum: Scientific method

Enhanced view of scholarship

Level of research activities: No. of presentations or publications

Career success

Faculty mentorship
Recommendations/Lessons Learned: Consistent with College Mission

“The mission of the University of Michigan, College of Pharmacy is to prepare students to become pharmacists and pharmaceutical scientists who are leaders in any setting. The College provides a quality education that effectively integrates critical thinking, problem-solving and leadership skills. Research in the pharmaceutical, social and clinical sciences and its translation into health care is a key component of our mission. The College achieves its mission by striving for excellence in education, service and research, all directed toward enhancing the health and quality of life of the people of the State of Michigan, the nation and the international community.”
Recommendations/Lessons Learned: Clearly Identified Purpose

• Enhanced educational experience
  – Recognized focus in curriculum
  – Orientation to scholarship and student initiated experiences
  – Enhancing problem solving skills for students
  – Emphasis on faculty-student mentorship

• Enhancing career choices and development
  – Pool of students for future research or scholarly careers
  – Enhanced marketability and flexibility in professional career
Recommendations/ Lessons Learned: Strong Commitment/Support

• All key constituents (administrators, faculty, alumni, employers, students)

• Strong research infrastructure (labs/equipment; patient setting)

• Active faculty (especially tenure/non-tenure clinical) research programs

• Strong administrative support to manage program
  – Reward faculty
  – Allocation of funds to support student research projects
  – Active promotion of this approach to stakeholders
Thank you!
University of Mississippi: Pharmacy Practice Pathway (Pathway)

Katie McClendon, Pharm.D., BCPS
Clinical Assistant Professor
University of Mississippi
Pathway Committee

- Kim Adcock, Pharm.D.
- Ashley Ellis, Pharm.D.
- Shirley Hogan, Pharm.D.
- Daniel Riche, Pharm.D.
- Matt Strum, Pharm.D.
Pathway Objectives

• Improve faculty/student relationships and increase interactions
  – Increase student access to Jackson-based faculty
  – Increase mentoring relationships
• Improve student preparedness for residencies and other post-PharmD training
  – Increase number of students applying and matching with residencies
  – Increase presentation of research
• Increase student understanding of scientific method and application of research methods
Q: What is the Pathway?

A comprehensive project that will start in PY1 and be completed during PY4 to demonstrate knowledge and skills acquired in Pharmacy Practice courses

- Involves longitudinal skill acquisition
- Student/faculty advising program: “The Family Plan”
- Students will sign a contract yearly, which outlines expectations for that year and remaining years
Pharmacy Practice Pathway

PY 1
- Introduce literature review and summarization
- Generate “Idea”

PY 2
- Develop “idea” into a written plan/project

PY 3
- Implement project

PY 4
- Write Abstract
- Present Seminar

Student/Faculty Advising Program: The Family Plan

Longitudinal Seminar Skills Development

Course Association/Assignments

<table>
<thead>
<tr>
<th>PY 1 Fall</th>
<th>PY 1 Spring</th>
<th>PY 2 Fall</th>
<th>PY 2 Spring</th>
<th>Block 1</th>
<th>Block 2</th>
<th>Block 3</th>
<th>Block 4</th>
<th>PY 4 Fall</th>
<th>PY 4 Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Info Skills</td>
<td>Skills Lab</td>
<td>Skills Lab</td>
<td>Skills Lab</td>
<td>PS</td>
<td>PS</td>
<td>PS</td>
<td>PS</td>
<td>Seminar</td>
<td>Seminar</td>
</tr>
<tr>
<td>Review Article</td>
<td>Submit Idea</td>
<td>A/A Reports</td>
<td>Draft Project</td>
<td>IRB App.</td>
<td>A/A Reports</td>
<td>A/A Reports</td>
<td>Raw Data</td>
<td>Presentation</td>
<td>Presentation</td>
</tr>
</tbody>
</table>

*CITI training will be initiated in PY1 and renewed each year*
Q: What kind of “Project”?

– Variety of “research” projects
– Could be surveys, “brown-bag”, chart reviews, bench
Q: What is the Family Plan?

• 2 Students assigned an advisor, beginning in PY1 year
• Every year, 2 new PY1 students will join the “Family”
• Students further along will help each other out with Pathway (and perhaps other areas)
• 22 advisors (4 adjunct faculty)
  – Most advisors have 2 families
PY1

- Students exposed to research during Information Skills course
  - Pathway to be presented early (August) in Info Skills Advisor assignments made soon after
  - Literature review article, hopefully on subject of project
- Spring Skills Lab will discuss idea generation
- Assigned faculty advisor this year, along with fellow classmate
PY2

- Develop “idea” into a written plan
- Fall Skills Lab: Advisor/Advisee report on progress is graded
- Spring Skills Lab: Draft project plan (part of grade)
- Keep same advisor, and 2 PY1 students added to the “family”; Faculty AND PY2s advise the PY1s
PY3

• Implement Project-graded in Problem Solving Course
  – Block 1: complete IRB application
  – Blocks 2 and 3: Advisor/advisee reports
  – Block 4: Data collection

• Keep same advisor, and 2 PY1 students added to the “family”; Faculty and PY3s advise the PY2s; Faculty, PY3s, AND PY2s advise the PY1s
PY4

Seminar Year
Students will submit abstract and present their project for Seminar

- *IF* student, faculty advisor, and Seminar Committee agree, student can change topic of presentation to new drug update, controversial topic, case presentation, etc

  - *Same level of presentation will be expected, with literature review, evaluation, conclusion, etc.*
PY4, cont

- Keep same advisor, and 2 PY1s are added to the “family”; Faculty, PY4s, PY3s, and PY2s advise the PY1; Faculty, PY4s, and PY3s advise the PY2s; Faculty and PY4s advise the PY3s.

- Seminars will be 20 minutes +/- 2 minutes, with time for questions.

- Rooms will be given themes for morning and afternoon so attendees can choose interest
  - i.e.: oncology, community pharmacy, pysch, misc
How does this actually work?

• Regardless of your campus, faculty will need to meet with students
  – Conference call, in person, Skype and/or Wiggio
  – Recommend Wiggio—like Skype + Google Groups + Doodle
Issues faced at UM

• Split campus
  – 2 IRBs
• Adjunct faculty used
  – IRB
• Communication
  – Harder when physically not near
• Faculty and student buy-in
Solutions

• Quarterly Pathway Advisors meetings
  – Communicate issues, solutions, upcoming deadlines

• Assign advisors a point-person on the Pathway Committee
Recommendations

• Communicate with IRB early if you are considering similar project
• Get buy-in early from key stakeholders in your department and school
Review

• Pathway will improve student/faculty relationships
  – Opportunity for mentoring
• Pathway will increase students’ knowledge and skills
Student Investigative Project at the University of Arizona

Marion K. Slack, PhD
Professor
University of Arizona
Acknowledgements

• Dr. Lyle Bootman, Dean
• Dr. John Murphy, Associate Dean
• Dr. Marie Chisholm-Burns, Department Head
• Faculty
• Former Faculty
  – Dr. JoLaine Draugalis
  – Dr. Karen Sauer
Investigative Projects at the University of Arizona College of Pharmacy

• All professional students are required to complete an investigative project for graduation (class size = 90-100)
• Students can work in groups of 1 to 3—results in 50 to 55 projects
• Student identifies adviser and topic
Investigative project is defined as:

- Planned investigation based on literature review
- Write a proposal
- Collect and analyze data (may be qualitative or quantitative, may use simple or advanced statistics)
- Write a report of findings
- Present findings (poster)
Approach to Student Mentoring

• Replaced graduate student model of mentoring with a shared adviser model—mentoring is shared between course coordinator (instructor) and project adviser
  – Instructor provides basic instruction, coordinates process, assigns/submits grades
  – Adviser provides content expertise, access to subjects, grades report and effort on project
• Reduces burden on adviser, standardizes process, supports advisers with limited research skills
Level of Student Skill for Writing a Study Proposal/Conducting a Study

• Generally very low; on a scale of 0 to 5 where 0 = I have no idea what to do and 5 = I have a good idea of what to do, mean rating is 1.2 (0.3)

• Usually rate themselves highest on purpose statement (mean = 1.7 [1.4]); lowest on data analysis (mean = 0.8 [1.0])
Timeline for Projects

• Fall P3—identify project adviser, general topic of project
• Spring P3—Write project proposal (2 unit class)
• Summer P4—Obtain IRB approval if needed
• Fall P4—Collect and analyze data (register for 2 unit class)
• Spring P4—Register for 2 unit class; write project report, prepare and present poster
Identify Adviser and Topic (Fall P3)

- As part of Preparation for Rotations class, students work in groups to:
  - Interview faculty to identify possible topics for investigative projects
  - Report of interview is uploaded into on-line course management system
  - Meet with course coordinator as indicated to identify adviser and topic
Proposal Class is a Skills Class

- Spring P3
- Primary purpose--enable students to obtain the basic cognitive skills needed to write a proposal
- General structure of class:
  - Short introductory lecture
  - In-class activity using a worksheet
  - Review worksheet responses
  - Work with specific groups of students or with individuals
Typical Class: Review of Example Proposal

• Example proposal provided as handout with worksheet
• Students work in self-selected groups
• Respond to questions on worksheet
• Instructor moves around classroom while students work; responds to questions as needed
• Discuss responses on worksheet
• Worksheet is handed in; graded pass/fail
Proposal Format

- Proposal follows a specific format:
  - Checklist
  - Title Page
  - Summary/Overview
  - Introduction (Problem statement, Lit review, Specific Aims, Hypotheses)
  - Methods (Design, Subject Selection, Human Subjects, Sample Size, Instruments/Variables, Procedures, etc.)
  - Timeline
  - Budget
  - References
  - Appendices
Completed Proposal

• Screened by instructor (acceptable vs not acceptable)
• Formally reviewed by a second faculty member
• Comments returned to adviser and students
• IRB application is completed if appropriate
Collection and Analysis of Data

• Typically occurs while students are doing rotations during summer & fall of P4
• Beginning with class of 2013, will register for 2 units of credit
• Primarily work with project adviser
• Course coordinator is available as needed
• Present at professional meeting (optional)
• Offer just-in-time workshops?
Writing Project Report

• Materials needed for writing final project report are available in on-line course management platform (Spring P4)
• Provide:
  – An example report
  – Handout on writing report
• Offer just-in-time workshops?
• Report is submitted to course coordinator via course drop box
• Report is graded by adviser
Poster

- Present study findings at a poster session for graduating students (Spring P4)
- Information on poster requirements etc. provided in on-line course system
- Work with adviser to develop poster
- Print poster at College at no cost
- Graded on presentation by faculty
Evaluation

• Mean rating was 4.3 (SD = 0.3) on a 0 to 5 point scale (rated problem statement highest 4.7 [0.5]; data analysis lowest, 3.6 [1.1])

• Assessment of proposals indicated class improved quality (before mean = 3.5 [1.3]; after = 4.7 [1.0]; p < 0.001)

• Anecdotal evidence indicates U of A students are mentors to other students during residencies

• National awards
Recommendations

• Shared adviser model using an instructor/course coordinator results in:
  – Reduced burden on individual faculty
  – Supports novice faculty
  – Provides structure to process

• Pay attention to process skills
  – Need to add activities for process skills?
PharmD Paper and Seminar: The Minnesota Experience

Doneka R. Scott, PharmD, MA
Assistant Professor
University of Minnesota
History

• Implemented in 1998

• Goals:
  – To integrate concepts acquired throughout the curriculum into a single body of work
  – To develop an area of expertise through independent effort mentored by faculty advisors
  – To understand and experience the process of answering a research question, beginning with an idea and concluding with a written manuscript.
  – To develop oral communication skills by preparing and delivering a formal professional presentation to faculty and peers
Curriculum

- **Fall P3**
  - PHAR 6181: PharmD Paper & Seminar

- **Fall P4**
  - PHAR 6183: PharmD Paper

- **Spring P4**
  - PHAR 6182: PharmD Seminar
PHAR 6181: PharmD Paper & Seminar

• 1 credit course
  – Delivered synchronously via interactive television

• Introduces students to the paper

• Each student:
  – Identifies a content advisor
  – Submits a PharmD Paper/Seminar Project Agreement Form
  – Completes their research proposal
Types of Research Projects

• Extensive research question driven literature review

• Laboratory research with/without animals or patients

• Survey research

• Research-based chart review

• Clinical research

• Educational research
PHAR 6183: PharmD Paper

- 2 credit course
  - Students do not meet as a class, work with advisors
  - Course directors orient students during the final class meeting of PHAR 6181

- Conduct research

- Write paper
  - Two drafts with feedback from advisors
  - Final paper due first Friday in December
PHAR 6182: PharmD Seminar

• Students prepare and deliver a 15-minute presentation, followed by 5-minute Q & A

• Second week in January
  – Tues, Weds, Thurs for Twin Cities students
  – Tues, Weds for Duluth students

• Students must attend two consecutive days
Administrative Advisors (AA)

- Randomly assigned, college faculty, campus-specific

- Responsibilities:
  - Assist in identifying a content advisor
  - Guide student in paper preparation
  - Assist with IRB submission
  - Monitor for deadlines & completion
  - Evaluate and grade paper
  - Attend, evaluate, and grade presentation
Content Advisors (CA)

- Selected by student: college faculty or practitioner

- Responsibilities:
  - Serve as content expert
  - Guide student for paper preparation
  - Meet regularly with student to ensure content accuracy
  - Monitor for deadlines & completion
  - Evaluate and grade paper
  - Attend, evaluate, and grade presentation
Challenges

• Faculty Concerns
  – Students should begin the process earlier
  – Students do not have thoughtful project ideas
  – Better communication is needed between student and advisors
  – Students are not submitting "true" literature reviews
  – Research papers/literature reviews lack hypothesis statement
  – Students have weak writing skills
  – Disproportionate workload for Duluth faculty members
Challenges

• Student-related Concerns:
  – Begin the process earlier
  – Student buy-in
  – Difficulty identifying content advisors
  – Ineffective preparatory course design
Solutions: PHAR 6181

• Timeliness
  – Develop three research questions of interest in early October
    • Conduct initial literature search to identify 3-5 resources to answer each question
  – 5-page research proposal due
    • Introduction, mini-lit review, research questions, hypothesis statement, methods
    • Timeline, references (not inclusive)
Solutions: PHAR 6181

• Advisor/Advisee Communication
  – Students meet with AA in early October
  • Present three research questions with 3-5 annotated references to answer the question
  • Narrow down topic
  • Identify a Content Advisor
  – Students submit research proposal to AA/CA for feedback and grade
Solutions: PHAR 6181

• Knowledge/writing deficiencies
  – Revamped Course
    • Incorporated lectures on completing research
    • NIH Human Subjects (or CITI) training required
    • Utilized the writing support resources on campus
    • Assignments applying newly acquired knowledge
    • Peer review of proposal prior to submission
Course Site

1. 9/7: Course Overview
   - Overview of PharmD IV Paper and Seminar Sequence - Dr. Udén
   - Assignment
   - Participation Grades
   - Attendance 9/7

2. 9/14: Why Should I Care?
   - Lecture Handout: Pharmacists Use of the Literature
   - Assignment
   - Participation Grades
   - Attendance 9/14
   - Week 2 - Introduction Presentation
   - Week 2 - Forum participation

3. 9/21: Developing Research Questions
   - Lecture Handout: Developing Research Questions
   - Required Readings
   - Lipovski 2000
   - Kwiatkowski 1998
   - Participation Grades
   - Attendance 9/21

4. 9/28: Developing Research Questions, Part II: Research Methodologies - "MEETING IN 1-450 MOOS"
   - Assignment
   - Lecture Handout: Research Methodologies
   - Required Readings
   - Hughes 2009
   - Constant 2000
   - Participation Grades
   - Week 4: Research Methodologies Viewing
   - "Heads Up"
   - Conducting Effective Literature Searches Assignment Due October 5th at 8:30am (See Details in Conducting an Effective Literature Search Forum for Week 5)

5. 10/5: Research Proposal Overview
Recommendations

• Gain faculty/student buy-in
  – Populate subcommittee with 1 or 2 faculty naysayers and include student representatives

• Integrate building blocks for the capstone project throughout the curriculum
  – Explicitly outline learning assets within the curriculum to students

• Allow enough time for remediation
Activity
• Develop a plan to incorporate a student-led scholarship program into your curriculum.
  – OR: Based on presentation, plan how to improve the program at your school.
Monday, July 11, 2011

Special Session: Building Professional Competencies Through Student-Led Scholarship: Capstone Experiences at Four Institutions

Activity Code: BYN2G3