Innovations in Pharmacy Education  
.Activity Number: 0217-0000-15-150-L01-P, 1.50 hours of CPE credit; Activity Type: A Knowledge-Based Activity

Wednesday, October 21, 2015  
9:45 a.m. to 11:15 a.m.  
Continental Ballroom 5

Moderator: William A. Kehoe, Pharm.D., FCCP, BCPS  
Professor of Clinical Pharmacy and Psychology; Chair, Department of Pharmacy Practice, University of the Pacific Stockton, California

Agenda

9:45 a.m.  
Re-engineering Pharmacy Education: How Can we Best Prepare Graduates for Clinical Pharmacy Practice Now and In the Future  
Paul O. Gubbins, Pharm.D., FCCP  
Associate Dean, Vice Chair & Professor, UMKC School of Pharmacy at MSU Division of Pharmacy Practice & Administration, University of Missouri-Kansas City, Springfield, Missouri

10:30 a.m.  
“Flip this Classroom”: Exploring the Use of the Flipped Classroom Model in Pharmacy Education  
Mary T. Roth McClurg, Pharm.D., MHS, FCCP  
Associate Professor, Division of Pharmaceutical Outcomes and Policy, University of North Carolina Eshelman School of Pharmacy, Chapel Hill, North Carolina  
Jacqueline McLaughlin, PhD, MS  
Assistant Professor, Educational Innovation and Research; Director, Office of Strategic Planning and Assessment, UNC Eshelman School of Pharmacy, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina

Conflict of Interest Disclosures

Paul O. Gubbins: no conflicts to disclose.  
William A. Kehoe: no conflicts to disclose.  
Jacqueline McLaughlin: no conflicts to disclose.  
Mary T. Roth McClurg: no conflicts to disclose.

Learning Objectives

1. Review the emerging roles of clinical pharmacists in the healthcare environment and how these relate to preparation of pharmacy graduates in the next 20 years.  
2. Discuss the impact of new accreditation standards on development and modification of pharmacy curricula to meet the needs of the changing healthcare environment.  
3. Discuss the role of interprofessional and service learning experiences in the experiential training of student pharmacists.
4. Explain the pedagogical benefits of using the flipped classroom model for delivery of pharmacy education compared to traditional teaching methods.
5. Explore the challenges of using the flipped classroom model.
6. Discuss the required resources and best approach to incorporating flipped classrooms into pharmacy curricula, particularly for teaching therapeutics.

Self-Assessment Questions

Self-assessment questions are available online at www.accp.com/gc15.
Re-engineering Pharmacy Education: How Can we Best Prepare Graduates for Clinical Pharmacy Practice Now and In the Future
Paul O. Gubbins, Pharm.D., FCCP
October 21, 2015

2015 ACCP Global Conference on Clinical Pharmacy

Learning Objectives

- Review the emerging roles of clinical pharmacists in the healthcare environment and how these relate to preparation of pharmacy graduates in the next 20 years.
- Discuss the impact of new accreditation standards on development and modification of pharmacy curricula to meet the needs of the changing healthcare environment.
- Discuss the role of interprofessional and service learning experiences in the experiential training of student pharmacists.

Pharmacy Practice (History)

- Profession’s role in U.S. healthcare system continues evolving from
  - product focused
  - to patient “oriented”
  - to frontline of patient-centered care, wellness & disease prevention


“Maximizing the roles and scope of pharmacists to deliver a variety of patient-centered primary care and public health, in collaboration with physicians, is a proven and existing paradigm of care that can be efficiently implemented.”

WHAT IS SHAPING FUTURE CLINICAL PRACTICE?

Conflict of Interests

- The presenter has no conflicts of interest to report
Pharmacy Practice (Forces driving change)*

- Technology
- An aging population
- Continued evolution of healthcare reform
- Pharmacy workforce supply & demand

* In no particular order

Technology (Internet)

- Low cost, fast method for many to access medical care & locate health resources
- Empowers patient to actively participate in managing their health with their provider
- Allows institutions, health professionals, health providers, & the public to interact & collaborate (distance education, telemed, etc)


Technology (Mobile Platforms)

- 7 billion (= 95.5% of world pop.) mobile subscriptions worldwide
- 64% of Americans own smartphones, & for many it is a key entry point to the online world


Technology (Mobile Platforms)

- 62% of smartphone owners use it to access health information
- Generations differ in readiness to adopt technology, which will evolve over time
- Practitioners must be cognizant of differences & adapt to patient preferences


THE AGING POPULATION

Aging Population (Impact of Baby Boomers)

- Entire generation will be ≥ 65 in 2030
- U.S population 65 +
  - 2010: 13%
  - 2030: 19%
- Drive pop ≥ 65 to more than double from 2010 to 2050

Aging Population
(Health of the Baby Boomers)
- Chronic illnesses & medication use common
  - hypertension 43%; anti-hypertensives 35.4%
  - dyslipidemias 73.5%; dyslipidemics 25.9%
  - diabetes 15.5%; anti-diabetics 11.3%
- Obesity common (38.7%)
- Infrequent regular exercise or no regular physical activity common


Health Care Reform
(The PPACA)
- Largest change in U.S. health policy since Medicare & Medicaid enacted in 1965.
- Main provisions firmly established in U.S. health policy


Health Care Reform
(Basic Goals)
- Provide security of health insurance to uninsured Americans
- Increase the quality of care
- Restrain the growth of costs
- Advance population health


Health Care Reform
(Impact on Practice)
- Added ≈ 16 million to insurance rolls so far
- CBO estimates ACA will add 26 million to insurance rolls by 2017


Health Care Reform
(Impact on Practice)
- Creation & evaluation of new clinical care models (i.e. ACO)
- Provisions that strengthens link between cost of care & quality of care
  - Hospital Readmission Reduction program
  - Healthcare-Acquired Condition program
- Shifts spending from rewarding volume of care provided to rewarding value provided

WORKFORCE SUPPLY & DEMAND

Pharmacy Workforce 2014
(Practicing Pharmacists)

- 75% of all licensed pharmacists
- ≈ 32% ≤ 40 years old
- ≈ 31% ≥ 55 years old
- Full-time professionals averaged 44.2 hrs/wk

Pharmacy Workforce 2014
(Practice Settings)

<table>
<thead>
<tr>
<th>Setting</th>
<th>Proportion of Pharmacists (%)</th>
<th>Change from 2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community (i.e. independent, chain, mass merchandiser, &amp; supermarket pharmacies)</td>
<td>44.1</td>
<td>↓</td>
</tr>
<tr>
<td>Hospital</td>
<td>29.4</td>
<td>↑</td>
</tr>
<tr>
<td>Other Patient Care</td>
<td>16.7</td>
<td>↑</td>
</tr>
<tr>
<td>Other Non-Patient Care</td>
<td>7.5</td>
<td>↑</td>
</tr>
</tbody>
</table>

Pharmacy Workforce 2014
(Work Place Activities)

<table>
<thead>
<tr>
<th>FT Pharmacist Activity</th>
<th>2014 Time of Effort (%)</th>
<th>2009 Time of Effort (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient care services associated with medication dispensing</td>
<td>49</td>
<td>55</td>
</tr>
<tr>
<td>Patient care services not associated with medication dispensing*</td>
<td>21</td>
<td>16</td>
</tr>
<tr>
<td>Business/organization management</td>
<td>13</td>
<td>14</td>
</tr>
<tr>
<td>Education</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>Research</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Other Activities</td>
<td>6</td>
<td>5</td>
</tr>
</tbody>
</table>

*35.3% of community pharmacist indicated time spent on patient care increased

Pharmacy Workforce 2014
(Current Services Provided)

- Most common: MTM (60%), immunizations (53%) & adjusting meds (52%)
- 48% in chain sites & 57% in supermarket sites offer health screenings.
- 77% of hospitals offered Med Rec
- > 25% of other patient care settings & hospital pharmacies have CPAs in place

http://www.aacp.org/resources/research/pharmacyworkforcecenter/Pages/default.aspx
Pharmacy Workforce 2014
(Pharmacist Workloads Perceptions)

- Nearly two-thirds believe workload high or excessively high
- Full-time pharmacists workload
  - 64% believe it increased or greatly increased in past year
  - 45% believe it had negative or very negative effects on mental/emotional health
- In chain & mass market settings workload negatively impacted time spent with patients


Pharmacy Workforce 2014
(Work Place Labor Reductions)

<table>
<thead>
<tr>
<th>Work Place Adjustment</th>
<th>2014 (%)</th>
<th>2009 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Restructuring of pharmacist work schedules to save labor costs</td>
<td>35</td>
<td>26</td>
</tr>
<tr>
<td>Mandatory reductions in pharmacist hours</td>
<td>17</td>
<td>13</td>
</tr>
<tr>
<td>Pharmacists layoffs</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>Early retirement incentives for pharmacists</td>
<td>6</td>
<td>4</td>
</tr>
</tbody>
</table>


Pharmacy Workforce 2014
(Aggregate Demand Index-Jul 2015)

<table>
<thead>
<tr>
<th>Region</th>
<th>Index Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Regions</td>
<td>3.62</td>
</tr>
<tr>
<td>Northeast</td>
<td>3.53</td>
</tr>
<tr>
<td>Midwest</td>
<td>3.71</td>
</tr>
<tr>
<td>South</td>
<td>3.64</td>
</tr>
<tr>
<td>West</td>
<td>3.56</td>
</tr>
</tbody>
</table>


Health Care Reform & the Pharmacy Workforce

- Profession in midst of dynamic times
- Direct patient care services increasing
- Opportunities for new roles likely to increase

"If the role of pharmacists changes where pharmacists spend substantially more time providing patient care management services, then demand will be higher than projected."


Medication Management
(Unmet Needs)

<table>
<thead>
<tr>
<th>Medication Related Problems</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinician-influenced gaps in care</td>
<td>inappropriate prescribing</td>
</tr>
<tr>
<td></td>
<td>ineffective prescribing</td>
</tr>
<tr>
<td></td>
<td>lack of care coordination</td>
</tr>
<tr>
<td></td>
<td>and inconsistent monitoring</td>
</tr>
<tr>
<td>Patient-influenced gaps</td>
<td>health beliefs</td>
</tr>
<tr>
<td></td>
<td>health illiteracy</td>
</tr>
<tr>
<td></td>
<td>past medication experiences</td>
</tr>
<tr>
<td></td>
<td>nonadherence</td>
</tr>
<tr>
<td>Systematic Gaps</td>
<td>processes lacking for medication reconciliation</td>
</tr>
<tr>
<td></td>
<td>poor care transitions</td>
</tr>
</tbody>
</table>


© American College of Clinical Pharmacy
### Medication Management Services (MMS)

- Build “gold standard” list of current prescribed & self-care medications
- Assess appropriateness, efficacy, safety, & adherence of each med to achieve optimal therapy goals
- Develop personalized medication action plan
- Document & communicate actionable recommendations to patients & providers


### Pharmacy MMS (Integrated, Team-based Care)

- Partner with patients, families, & providers to focus on patient specific issues that are key to achieving desired outcomes
- Manage medication related problems, prevent ADE to avoid preventable medication related hospitalizations & ED
- Help ensure optimal drug therapy outcomes during care transition


### Pharmacy MMS Models (Employed Model)

- Employed by practice as a clinician staff member
- Suitable for large group practices or integrated delivery systems
- Must be able to afford hiring pharmacists for non-dispensing activities


### Pharmacy MMS Models (Embedded)

- Employed, (usually part time), at practice site via partnership between practice & a hospital pharmacy or pharmacy school
- Has responsibility for training pharmacy students & residents in team-based care & medication management
- Affordable: partner & practice share responsibility for pharmacist’s compensation


### Pharmacy MMS Models (Regional)

- Employed by health system or physician organization & serves several practices in a geographic area
- Typically focused on population health, may develop & deliver MMS in the practices
- Can be involved in educational programs, quality improvement services, & outcomes research


### Pharmacy MMS Models (Shared Resource Network)

- Contracted by a provider group, ACO, or payer to provide MMS for specific patients
- Meets with a patient in person in variety of settings, or via telemedicine connection
- Attractive to smaller MD practices, ACOs, community-based health teams, & payers, network responsible for personnel

Regional Model Example
(Kaiser Permanente Colorado-KPCO)

- Integrated health care delivery system
- Serves > 530,000 members (Denver/Boulder & its metro area, Colorado Springs, Pueblo, Loveland, & Ft. Collins)
- Clinical pharmacists provide primary & specialty patient care as part of a PCMH
- Centralized clinical pharmacy telephonic services also provided


Pharmacist Activities
(KPCO)

- ≈70% effort devoted to consulting with PCP or providing direct patient care
- ≈25% effort devoted to addressing regional & clinic-specific pop. management initiatives
- ≈5% effort devoted to non-patient care activities


UIC HIV Telemed Clinic
(Pharmacist Role)

- Patient education
- MMS addressing med adherence, identifying and managing medication induced AEs, managing drug interactions, & making therapeutic recommendations
- Subsidized via contract & savings from 340B program


Shared Resource Example
(UIC HIV Telemedicine Clinic)

- Large, urban, academic medical center partner with state department of corrections
- Provides care for inmates in 28 adult correctional facilities using an interprofessional approach
- Technology enables interactions similar to traditional face-to-face clinic visit


Standards 2016:
CURRICULAR MODIFICATIONS TO MEET THE NEEDS OF THE CHANGING HEALTHCARE ENVIRONMENT

© American College of Clinical Pharmacy
Meeting Practice Needs Through Standards Revision

- Current & future competencies of pharmacists
- Practices to assess student learning & the quality of professional pharmacy programs

"The status quo is not an option" in pharmacy practice, pharmacy education... "We must continue to advance the roles of pharmacists to meet the future needs of patients.*


Standards 2016
(What’s Different)

- Philosophy and Emphasis
  - based on stakeholder feedback
  - refined to ensure that graduating students are "practice-ready" & "team-ready"
  - greater emphasis on CAPE outcomes & the level of student achievement of these outcome
  - emphasize assessment as a means of improving the quality of pharmacy education
- Formatting, organization, guidance, more innovation


CAPE Outcomes (Version 4.0)

- Influenced by 3 pillars of pharmacy education & consistent with IOM core competencies
  - pharmaceutical care, management of medication-use systems, public health
- Added attention to
  - affective domain of pharmacy practice (e.g. communication, professionalism, etc.)
  - patient safety
  - interprofessional health care.


CAPE Outcomes (Version 4.0)

- Focused on the end product of Professional Pharmacy program (i.e. the knowledge, skills, & attitudes all entry-level graduates should possess
- Define the curricular priorities of the Doctor of Pharmacy programs
- Aspirational & emphasize increased program expectations


CAPE Outcomes (Affective Domain)

- Included to recognize importance of professional skills & personal attributes to practice
  - emphasizes self-awareness, innovation leadership, & professionalism needed for practice
  - bridges foundational scientific knowledge with essential skills & approaches to practice & care
- Enables pharmacists to transform knowledge & skills into positive outcomes in all settings.

Standards 2016
(Team & Practice Ready)

<table>
<thead>
<tr>
<th>New or Improved Element</th>
<th>Contribution to Preparing Students for Changing Health Care Environment</th>
</tr>
</thead>
</table>
| Earlier experiential experiences | • Foundational knowledge throughout curriculum, patient interactions, patient safety
• Communication, interacting with patients & other professionals about medicines
• Professionalism |
| Interprofessional Education | • Team-based skills (clinical expertise, developing collaborative relationships, accountability for patient outcomes)
• IPE competencies & professionalism, |
| Enhanced assessment | • Critical thinking |
| Pharmacy Curriculum Outcomes Assessment | • Assessment outcome achievement
• Foundational knowledge |
| Co-curriculum | • Professionalism, leadership, critical thinking, personal & professional Development |

CONTRIBUTION OF IPE & SERVICE LEARNING IN THE EXPERIENTIAL TRAINING OF STUDENT PHARMACISTS

The Value of IPE Activities

*When students from two or more professions learn about, from and with each other to enable effective collaboration and improve health outcomes*


Importance of Co-Curricular Activities in Pharmacy Education

- Standard 4.2 requires program to develop student leadership (“..demonstrate responsibility for creating & achieving shared goals, regardless of position”)
  - emphasizes “..importance curricular AND co-curricular experiences in advancing professional development of students”
- Key element 12.3 - develop means to document competency in the affective domain-related expectations in Std 3 & 4

Perceived Benefits to Co-curricular Assessments

- Educates “the whole student”
- Allows for the integration of academic, professional, & personal development
- Foster the development of student knowledge & personal development outside of the classroom
- Activities often provide leadership opportunities
- Leadership is teaches beliefs & skills that will be useful in patient-centered team based practice

Realizing the Value of Co-curricular Activities

- Health care reforms created greater patient care & disease management roles
- Leadership within profession needed to close gap between the vision of ideal practice & current practice requires within the profession
- Exposing students to leadership concepts & professionalism provides skills needed to identify opportunities & deal with challenges in their careers


© American College of Clinical Pharmacy
Perceived Drawbacks to Co-curricular Assessments

- Co-curricular activities have been considered “extra-curricular” (i.e. voluntary based upon individual student interest(s)) not required
- “Curricularizing” these activities will encourage students to engage in them for the wrong motives (“have to” not “want to”)
- New infrastructure needed to develop & perform assessment of these activities

Concluding Remarks

- Several forces driving change have created a dynamic era for pharmacy practice
- Education & training standards are responding to prepare students for emerging new practice models & opportunities
- Learners of today will practice in a patient centered, team-based environment that will be supported by health-information and patient focused technology tomorrow
Flip this classroom: Exploring the use of the Flipped Classroom Model in Pharmacy Education
October 21, 2015 9:45-11:15

Learning Objectives

- Explain the pedagogical benefits of using the flipped classroom model for delivery of pharmacy education compared to traditional teaching methods.
- Explore the challenges of using the flipped classroom model.
- Discuss the required resources and best approach to incorporating flipped classrooms into pharmacy curricula, particularly for teaching therapeutics.

Flipped Classroom: Defined

What does “flipped classroom” mean?
- Bergmann & Sam (2012) instructors post material online for students to learn on their own so that class time can be dedicated to student-centered learning activities, like problem-based learning and inquiry-oriented strategies
- Also called: inverted, backward, or reverse classroom
- Examples in physics, economics, medicine, etc.
  - Deslauriers (2011) Science

Flipped Classroom: Structure

1. Pre-class learning
2. In-class active learning
3. Assessment

- Necessary but not mutually exclusive
- Many variations of the flipped classroom are described in the literature

Table 1. Characteristics of ten flipped courses at UNC Eshelman School of Pharmacy (2012-2014)

<table>
<thead>
<tr>
<th>ID</th>
<th>Year/Course Type</th>
<th>Pre-Class Learning Format</th>
<th>In-Class Learning Strategies</th>
<th>Graded Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Year 1/Science</td>
<td>Test</td>
<td>Case-based Learning (CBL)</td>
<td>Quizzes, exams</td>
</tr>
<tr>
<td>2</td>
<td>Year 1/Science</td>
<td>Video</td>
<td>Peer discussions</td>
<td>Quizzes, exams</td>
</tr>
<tr>
<td>3</td>
<td>Year 1/Science</td>
<td>Video &amp; test</td>
<td>Clickers, CBL</td>
<td>Quizzes, exams</td>
</tr>
<tr>
<td>4</td>
<td>Year 1/Science</td>
<td>Video &amp; test</td>
<td>Clickers, post-discussion</td>
<td>Quizzes, exams</td>
</tr>
<tr>
<td>5</td>
<td>Year 1/Science</td>
<td>Video</td>
<td>Clickers, CBL, micro-lecture</td>
<td>Quizzes, exams, paper</td>
</tr>
<tr>
<td>6</td>
<td>Year 1/Science</td>
<td>Video</td>
<td>Clickers, CBL, micro-lecture</td>
<td>Quizzes, exams, paper</td>
</tr>
<tr>
<td>7</td>
<td>Year 1/Science</td>
<td>Video</td>
<td>Clickers, CBL, micro-lecture</td>
<td>Quizzes, exams</td>
</tr>
<tr>
<td>8</td>
<td>Year 1/Pharmacotherapy</td>
<td>Test</td>
<td>Clickers, CBL, micro-lecture</td>
<td>Quizzes, exams</td>
</tr>
<tr>
<td>9</td>
<td>Year 1/Pharmacotherapy</td>
<td>Test</td>
<td>Clickers, CBL, micro-lecture</td>
<td>Quizzes, exams</td>
</tr>
<tr>
<td>10</td>
<td>Year 1/Pharmacotherapy</td>
<td>Test</td>
<td>Clickers, CBL, micro-lecture</td>
<td>Exams</td>
</tr>
</tbody>
</table>
Flipped Classroom: Examples


Benefits

- Why implement the flipped classroom?

PHCY 411

- Quantitative Approach (quasi-experimental)
  - N = 162
  1. Exam grades and course evaluations from 2011 (traditional) and 2012 (flipped)
     - independent t-test
  2. Pre-post survey responses from 2012 class prior to start of first class and at conclusion of last class (n = 150)
     - paired t-test

Primary findings

- Flipped class in 2012 performed better than traditional class in 2011 on final exam (p < .01)
- Course evaluation metrics significantly higher in 11/14 items (p < .05)
- In pre-survey, 73% of students preferred lectures. In post-survey, only 15% of students preferred lectures to the flipped model (p < .001)

Challenges

- Required Resources
  - Technological support
    - Pre-class materials
    - In-class activities
    - Assessments
  - Educator development
  - Time
  - Teaching assistant?
  - Others?