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Converting a paper-based, progressive, reflective, longitudinal career development student portfolio to an e-version and incorporating self-assessment of ability-based outcomes.

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What is a portfolio?

- An organized documentation of growth and achievement that provides tangible evidence of the attainment of professional knowledge, skills, and dispositions.
- A collection of evidence of both products and processes of learning. It attests to achievement and personal and professional development, by providing critical analysis of its contents.

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Why a Student Portfolio for Pharmacy?

- Personal, goal-directed, reflective, progression portfolio with connections to the learning and professional development processes (a curriculum of identity)
  1. Incorporate new science about how learning occurs and how to improve it (Learning about Learning)
  2. Incorporate new focus on the "reflective practitioner" in health profession education
  3. Student engagement -- connection to faculty member (NSSE)
  4. Evolved to include documentation of Ability-Based Outcomes"

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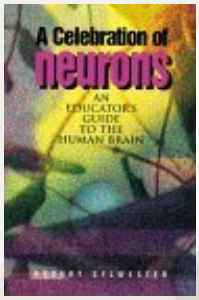
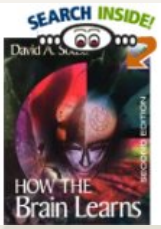
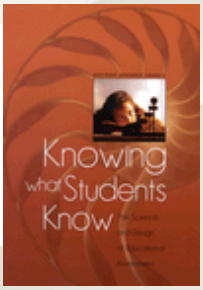
New Books Neuroscience







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Contributions of Neuroscience to Learning

- Major messages from neuroscience studies
  - Incorporate active learning and collaboration
  - Incorporate meta-cognition (thinking about thinking) and reflection on learning experiences
    - *REFLECTIVE PORTFOLIO!!!!!*
  - "Help students to take control of their own learning by defining learning goals and monitoring their progress in achieving them." (NAS)
    - *Yearly professional development program*

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Student Ownership and Learning

- Student-centered assessment (e.g. Portfolios) CAN become a part of the "Culture of Learning"
  - Create a sense of "personal ownership" over one's accomplishments...ownership promotes feeling of pride, responsibility, and definition."
    - *Use a "self-regulated learning" model*
    - *Self-assessment of mastering competencies*

Paris SG et al. Becoming Reflective Students and Teachers with Portfolios and Authentic Assessment, Psychology in the Classroom, American Psychological Association, Washington, DC, 1999.

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Reflective Learner

- The reflective learner can be seen as someone who explores their experiences of learning to better understand how they learn with a view of improving future learning – bedrock of lifelong learning
- Reflective learners are likely to be
  - More self-aware and self-critical
  - Motivated to improve
  - More able to carry through independent learning

- Oxford University

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Application of Portfolios in the Pharmacy Program

- Intention is to facilitate professional development/socialization of students
- Phased implementation over 5 years
- Elements of the portfolio process change as students progress in the program
- Assessments are guided by rubrics and are administered by faculty advisors

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Northeastern University's PharmD Program

- Six year Doctor of Pharmacy Program
- Average professional year class size of 130 students
- Three 4-month Introductory Pharmacy Practice Experiences (Co-op)
- Capstone 36 weeks of advanced clinical experiences

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The Pharmacy Curriculum

- Two years of pre-professional studies, mostly in arts and sciences
- Three years of professional studies including cooperative education
- One year of advanced clinical experiential education

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	FALL	SPRING	SUMMER
YEAR 1	General Chemistry 1/ Lab/ Recitation General Biology 1/ Lab Foundations of Psychology OR Precalculus College Writing College: An Introduction	General Chemistry 2/ Lab/ Recitation General Biology 2/ Lab Calculus Foundations of Psychology OR Elective Introduction to the Profession of Pharmacy	Vacation
YEAR 2	Organic Chemistry 1/ Lab/ Recitation Human Physiology and Anatomy 1/ Lab Physics for Pharmacy/ Lab Diversity Elective	Organic Chemistry 2/ Lab/ Recitation Human Physiology and Anatomy 2/ Lab Medicinal Microbiology Arts & Humanities Elective Pharmacy Practice	Coop / Experiential Learning
YEAR 3	Biochemistry Adv. Writing in the Health Professions Pharmacology/ Medicinal Chemistry 1 Pharmaceutics 1	Coop / Experiential Learning	Health-Care Systems Communication Skills Pharmacology/ Medicinal Chemistry 2 Pharmaceutics Laboratory Pharmaceutics 2
YEAR 4	Coop / Experiential Learning	Pharmacokinetics and Biopharmaceutics Immunology Comprehensive Disease Management (CDM) 1 Research Methodology and Biostatistics CDM 2 CDM Seminar	Therapeutic Drug Monitoring and Applications Clinical Clinical Toxicology Pharmacy Care Management CDM 3 / Seminar Drug Information and Evaluation Elective (Optional)
YEAR 5	CDM 4 CDM 5 CDM Seminar Jurisprudence Pharmaceutical Care Lab 1 / Capstone APPE Prep 1 Elective	CDM 6 CDM 7 CDM Seminar Pharmacoeconomics Pharmaceutical Care Lab 2 / Capstone APPE Prep 2 Elective	Advanced Practice Experience (APPE) 6, 6 week APPE'S assigned over the one year time period

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Portfolio Work within the Curriculum

- 1st year - Introduction to Pharmacy
  - Career goals, PDP, professional involvement
- 2nd year - Co-op Seminar
  - Career goals, PDP, co-op selection, professional involvement
- 3rd year - Pharmaceutics
  - Career goals, PDP, reflect on 1st co-op and plan for 2nd, professional involvement
  - Electronic conversion – also documenting achievement of ability-based outcomes

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Portfolio Work within the Curriculum

- 4th year - Research Methods
  - Career goals, PDP, reflect on all co-op and how inform career choice, involvement
- 5th year – Pharmacy Practice
  - Career goals, PDP, identify placement preferences
- 6th year - Advanced Pharmacy Practice Experiences
  - Career goals, PDP, document mastery of clinical competencies, reflection

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Faculty Roles

- Course/seminar coordinators provide written guidelines to students
- Faculty advisors are assigned to and meet with students during draft and final stages
- Faculty provide guidance and professional advice
- Faculty complete assessments and provide information to students and coordinators

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Student Reflections and Integrated Learning Models

- Review campus-based and experiential education and think about their inter-relationships
- Develop and refine professional goals and plans based on work experiences and faculty/preceptor input
  - Curriculum of identity
- Assess strengths and weaknesses and consider them relative to professional planning and improvement

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Faculty Responses to the Portfolio Review Process

- Most faculty participate voluntarily and advise about 4-8 students per semester
- Some faculty meet with students in groups
- Several reminders are needed to ensure that students and faculty meet deadlines
- Faculty seem to enjoy the process
- Assessments will be used to guide future applications of the portfolio process

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Why change to e-portfolio?

- Need for data aggregation of information in student portfolio
- Student documentation of Ability-based Outcomes (ABOs)
- Campus-wide interest and demonstration project AND university technical support

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E-portfolio solutions

- In 2008 the Assessment Committee began to explore e-portfolio solutions
- Independently, the University charged the EdTech center to identify a platform for e-portfolio
- A University TaskForce went through a comprehensive exploration and identified TaskStream for e-portfolio pilot

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E-portfolio conversion

Section	Main components	Data collected
Personal Section	Picture and background info	Demographics
Career Section	Primary and secondary career goals and rationale	Form
	Career action plan with 3 activities for current year and 2 activities for each subsequent year	Template asks students about why they chose the activity and what they learned from it
Professional Activities	Three professional activities that are tied to exploring career goals with reflections	Template for reflection; each activity can be linked to an ABO ABO form asks students to self-assess any ABOs that were covered by professional activities

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E-portfolio conversion

Section	Main components	Data collected
Academic Section	Documentation of ABO achievement through course work Students asked to submit artifacts for at least 5 of 8 ABOs covered during the semester	Each artifact is attached to standard and is accompanied by reflection ABO self-assessment form is filled out for all ABOs covered via coursework
IPPE (Co-op) section	Reflection on first 4months IPPE experience	Template for reflection ABO self-assessment form for ABOs covered during IPPE
	Future IPPE site preferences (2nd and 3rd) with preference for type of practice setting, location, and rationale tying these to the career goals	Form

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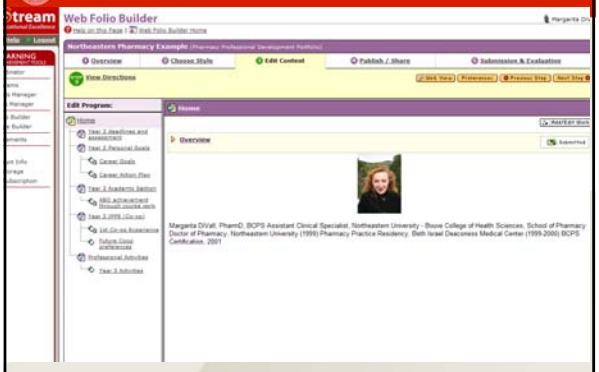

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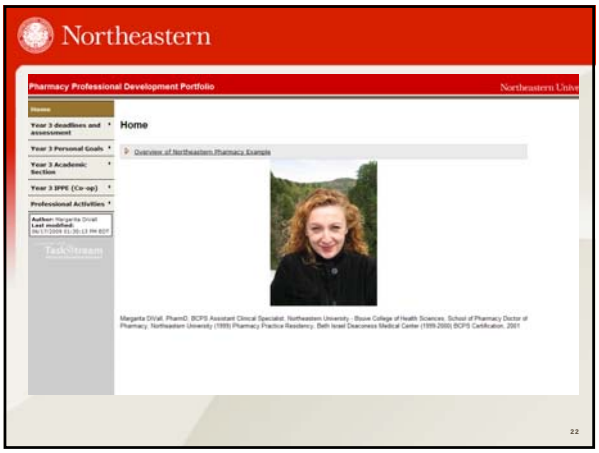
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Pharmacy Professional Development Portfolio
Home
Year 3 deadlines and assessment
Year 3 Personal Goals
Year 3 Academic Section
Year 3 IPPE (Co-op)
Professional Activities
Overview of Northeastern Pharmacy Example
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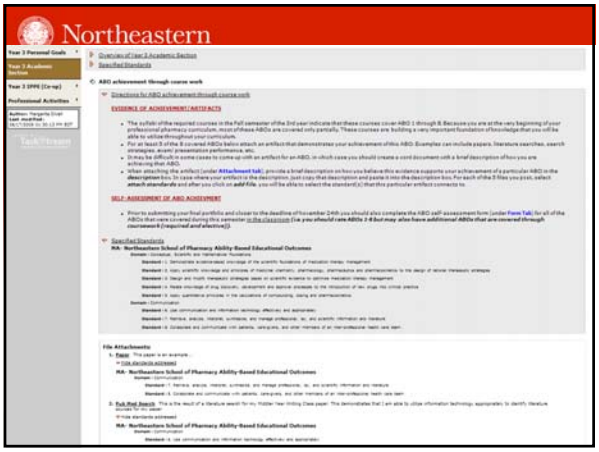
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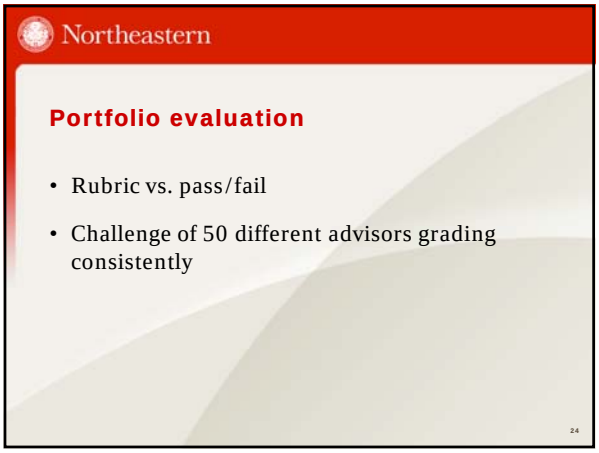
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Portfolio evaluation
• Rubric vs. pass/fail
• Challenge of 50 different advisors grading consistently
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Portfolio evaluation

- Pass/Fail
  - Advantages
    - *Simplified*
    - *Students have to meet all requirements to pass*
  - Disadvantages
    - *No ability to assess quality of work*
    - *No incentive for students to submit work on time*

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Challenges in implementation

- Resources
  - Costs and administrative
- Learning curve for administrators
- Learning curve for students and faculty
- Training time

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Data aggregated

- Primary and Secondary Career Goals
- ABO self-assessment
  - Academic
  - Experiential (IPPE/ Co-op)
  - Professional activities
- Preferences for 2nd and 3rd IPPE
  - Practice type
  - Location

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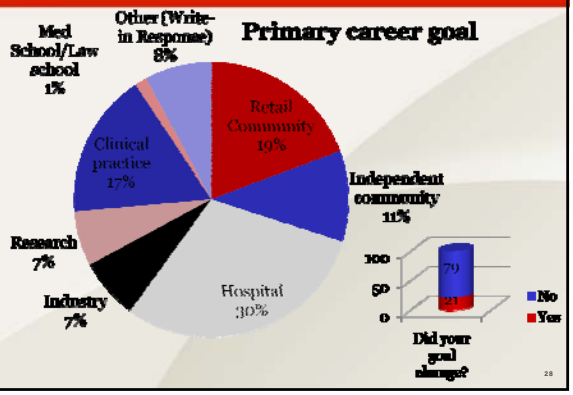
Primary career goal



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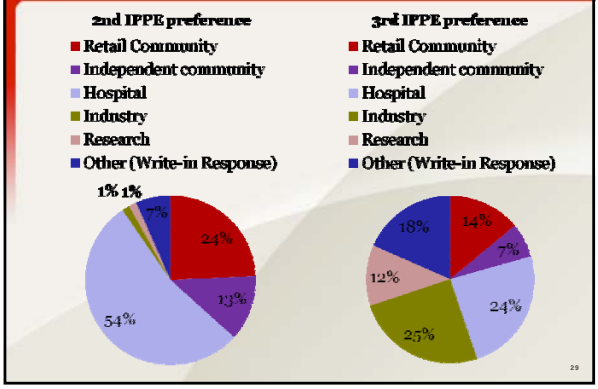

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Academic ABOs Self-Asessement

Response Legend:

1 = K: Know/ recall facts **2** = C: Can explain in my own words facts/ implications **3** = A: Apply facts to a new situation/ solve a problem **4** = E: Critically analyze components of a complex problem; compare & contrast solutions to the problem **5** = S: Develop a recommendation/approach to a problem based on the critical analysis of components

Rated Item(s)	Total	N/A	Ave
1. Demonstrate evidence-based knowledge of the scientific foundations of medication therapy management	116	2.6	2.6
2. Apply scientific knowledge and principles of medicinal chemistry, pharmacology, pharmaceutics and pharmacokinetics to the design of rational therapeutic strategies	115	1.7	2.9
3. Design and modify therapeutic strategies based on scientific evidence to optimize medication therapy management	114	9.7	2.6
6. Use communication and information technology effectively and appropriately	113	2.7	3.4
7. Retrieve, analyze, interpret, synthesize, and manage professional, lay, and scientific information and literature	114	3.5	3.3

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Student survey results

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Faculty survey results

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Lessons learned

- Student acceptance is low
- Need to simplify
  - ABO self-assessment in 3 different places
- Need to invest more time with students teaching them how to document achievement of outcomes

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Challenges

- Costs
  - Structured e-portfolios are fee-based
  - University vs. students to pick up the cost
- Need for infrastructure
  - Administrative and technical expertise
  - Training resources
  - Incorporation into progression standards