Enhancing Learning, Improvement, and Accountability Through Electronic Portfolios

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Abstract

IUPUI uses two electronic portfolios to demonstrate assessment and achievement of core learning outcomes. The student portfolio engages students in mastering six Principles of Undergraduate Learning (PULs) and provides data for assessing achievement of these PULs. The institutional portfolio documents learning at individual and aggregated levels, drawing on the student portfolio for authentic work and aggregated information. Together, the two portfolios comprise a focused, complex system of documenting and improving learning processes and achievements.

Recent national reports have argued that higher education institutions need to focus more explicitly on the fundamental liberal learning outcomes expected of college graduates. These outcomes should be defined more clearly, cultivated more intentionally, and assessed more systematically than they currently are at most institutions (see, for example, AAC&U 2002; and A. Doherty, T. Riordan, and J. Roth 2002). Such calls to engage students more deeply in carefully planned, coherent liberal learning experiences pose particularly daunting challenges for urban and metropolitan universities, which tend to be complex, decentralized, and focused on professional, rather than liberal, education. In addition, the kinds of educational experiences advocated in these reports are especially difficult to develop, implement, and assess at metropolitan universities, with their typically high proportions of first-generation, part-time, commuter, and transfer students (Ewell 2002).

At Indiana University-Purdue University Indianapolis (IUPUI), electronic portfolios comprise a key campus strategy for responding to these challenges, helping us to deepen student engagement in learning and to understand more clearly the abilities and skills our students develop as a result of the educational experiences we provide. Across the country, colleges and universities have begun using electronic *student* portfolios to engage students in learning, help them to draw connections among disparate courses and learning experiences, and support their development as more autonomous, self-aware learners. To a lesser, but still significant, extent, colleges and universities are creating electronic *institutional* portfolios as a medium for demonstrating student learning and institutional effectiveness to internal and external stakeholders.

IUPUI has elected to develop connected initiatives that use both types of electronic portfolios to support and document learning, assessment, and accountability. While both initiatives are relatively young, experience so far suggests that our approach holds promise for bringing faculty together across a highly diverse, complex urban campus to work toward both enhanced student learning and better understanding of the nature of that learning.

ePort: IUPUI's Electronic Student Portfolio

IUPUI's electronic student portfolio (ePort) speaks directly to the themes of raising student accomplishment, creating opportunities for more coherent, integrated learning experiences, placing learning in a framework of engagement and inquiry, and defining and measuring student and institutional success in learning. We are designing a portfolio that not only documents student achievement and improvement in learning, but, by its very structure, contributes to that learning. We are drawing upon and integrating some of the best conceptual frameworks for electronic student portfolios around the country, most notably those of Alverno, Rose-Hulman, and Clemson, as we develop an infrastructure that fits our own institutional context.

As an urban institution located in the heart of metropolitan Indianapolis, IUPUI serves many local and regional constituencies. Like most urban campuses, we are primarily a commuter campus, currently providing residential accommodation for only 1.6 percent of our student population and with a Student Center building just nearing its groundbreaking phase. Our results on the National Survey of Student Engagement indicate that our students spend more hours per week on average working and fulfilling domestic responsibilities than students in our peer institutions. As is often the case at urban universities, many of these career-oriented students view their college education as a regimen of arbitrary, fragmented requirements disconnected from their intellectual and career goals. In this context, explicit, intentional efforts are necessary to engage students in learning and to help them see coherence among their educational experiences and connectedness between their education and the rest of their lives; ePort is being designed to provide that coherence and connectedness.

Countless definitions for electronic student portfolios can be found in both published and presentational formats; our definition, thus, of necessity, echoes and integrates the ideas of many others. Currently, the working definition for the IUPUI student electronic portfolio is as follows: *a collection of purposefully organized artifacts that supports retrospective and prospective reflection to document, augment, and assess growth over time.* These artifacts may include text documents, transcripts, certifications, performance videos, images of submitted work, web sites, and more.

Implementing this definition involves several key principles of practice:

- Students have lifelong ownership and control of their ePort;
- Students have the right and ability to grant limited access to portions of their ePort and to move their ePort to other institutions;

- Students benefit from both personal and automated guidance in selecting artifacts for ePort;
- ePort supports reflective practices essential for lifelong learning;
- ePort supports campus- and faculty-determined curricular rubrics to establish the credibility and significance of artifacts;
- ePort contributes to the development of intellectual and technological standards for portability and for lifelong individual and institutional value.

The purposeful organization referenced in the definition is represented by a Learning Matrix designed around the Principles of Undergraduate Learning (PULs) approved in 1998 by the IUPUI Faculty Council. The PULs include: core communication and quantitative skills; critical thinking; integration and application of knowledge; breadth, depth, and adaptiveness of knowledge; understanding of diverse societies and cultures; and development of values and ethics. The concept underlying the elements of this list is that these intellectual activities and ways of knowing permeate the entire undergraduate curriculum, with expectations for both growth and achievement. The PULs provide a foundation for learning, as well as a set of intellectual skills and perspectives that contribute to lifelong learning, engaged citizenship, and employability. In addition, they comprise a common set of learning outcomes for students, regardless of major or professional program, and a coherent framework for thinking about learning for students and faculty campus-wide. For these reasons, they were the logical choice for the conceptual foundation of ePort, which aims to document and enhance growth and achievement in the PULs, as demonstrated in both curricular and co-curricular learning.

With the assistance of faculty and student groups, we have articulated three goals for ePort:

- to help both faculty and students reach a clearer, more coherent understanding of how aspects of the curriculum support students' increasing mastery of the PULs;
- to contribute to the assessment of student learning of the PULs at the levels of the individual student, the course, the program, and the institution; and
- to support student engagement with the PULs over their entire undergraduate experience, beginning in the first-year learning community and culminating in the capstone experience.

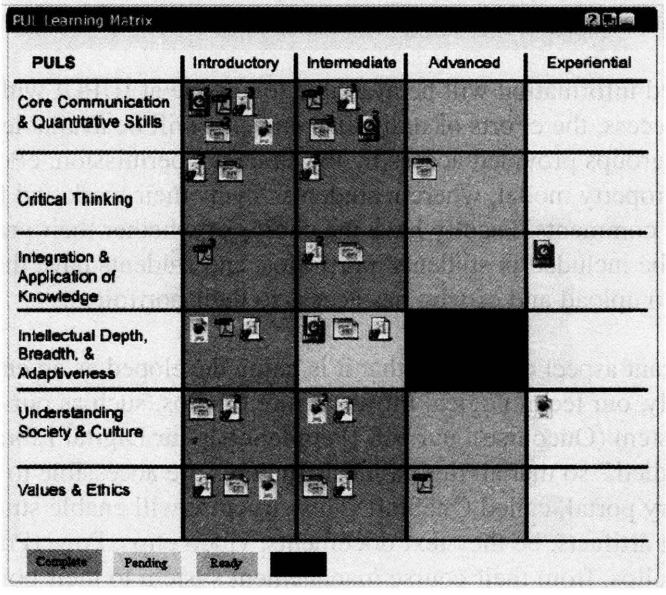
In order to further the potential of the PULs to provide a coherent path through undergraduate learning at IUPUI, faculty have identified four levels of competence in the PULs to track student growth and achievement:

1. **Introductory:** what all undergraduate students at IUPUI should know and be able to do in relation to the PULs within the first 26 credit hours. This level sets expectations and learning outcomes for all students, regardless of their anticipated major or intended professional school. These introductory-level learning outcomes have been developed by a process of campus consensus, using faculty teams drawn from multiple disciplines to agree upon a set of expectations. With 22 academic

units and over 1,600 faculty serving 30,000 students, the process of coming to consensus has been lengthy, but has also produced some very valuable conversations.

2. **Intermediate:** what all undergraduate students at IUPUI should know and be able to do in relation to the PULs within the first 56 credit hours. This level also sets expectations for all students, regardless of major or professional program, and relies on a process of campus consensus. The credit-hour limit was selected because it is the minimum needed to achieve an Associate's Degree and will enable IUPUI to track the knowledge and skills of these degree recipients. Additionally, evaluating students at this level will allow Associate Degree students to have a portfolio of certified intellectual achievements in skills valued by potential employers.
3. **Advanced:** what all IUPUI graduating seniors should know and be able to do in relation to the PULs. Because ways of knowing and core skills of communication and quantitative reasoning are intricately bound to the tacit traditions and governing paradigms of each discipline, these outcomes are being developed at the department and professional school level.
4. **Experiential:** This is not, in the strictest sense, a *level* of competence, but rather an *arena* of competence. Not all higher learning occurs in the classroom. This experiential component enables students to demonstrate co-curricular and extra-curricular learning in relation to the PULs. Rather than being developed by faculty, this section of ePort is being developed by a student task force. This group of 16 students, ranging from beginning freshmen to seniors, will work together for two semesters to determine what policies and assessment procedures would enhance the effectiveness of this part of ePort and its benefit to students.

Students demonstrate their growth and proficiency in the PULs on the Learning Matrix, which is the core of ePort, and which graphically shows on one screen each student's undergraduate learning achievements.



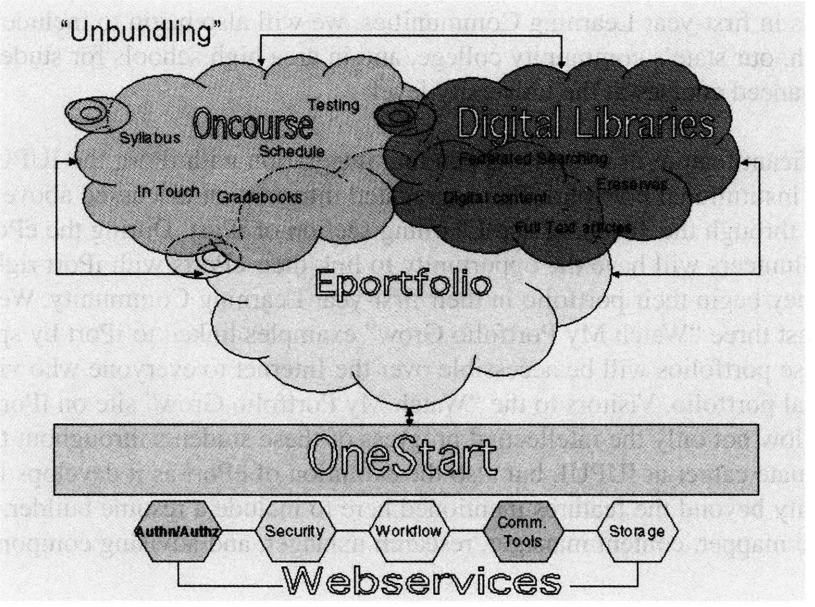
As students complete each cell in the matrix, according to the expectations developed by campus consensus (introductory and intermediate levels), or by their department or professional program (senior level), or by the student task force (experiential level), they write a reflection that explains how the individual learning artifacts in the cell demonstrate improvement and achievement in that particular PUL. These reflections are sent electronically to our trained ePort readers, who determine whether the cell's contents meet campus expectations and then write a response back to the student, explaining the strengths of documentation and providing guidance for any weaknesses. For the ePort pilot, members of our Senior Academy (retired professors wanting to remain intellectually connected with the campus) serve as ePort readers. As we scale up the project, we will include alumni, members of the community, academic staff, academic administrators, and faculty, in order to create a community of learning on and beyond the campus. This engagement of members of the community in the reading of, responding to, and assessment of student learning at IUPUI is an intentional move to situate the intellectual climate of the campus within the needs and expectations of the metropolitan community in which we are located, and which we serve.

The decisions about whether each cell meets, does not meet, or exceeds campus expectations are aggregated within the portfolio infrastructure and available through a number of demographic pathways. For example, if the Dean of Science wants to know how many rising juniors have successfully completed cells in Values and Ethics at the intermediate level, he could access that information. If the Vice Chancellor for Student Life and Diversity wants to find out how many African-American, Hispanic, or American Indian students at the sophomore level have completed their introductory-level cells in critical thinking, or core skills, or any of the other PULs, she could access that information on an aggregated basis. In this way, the Learning Matrix provides access to student learning at all levels, from the individual student to the entire campus. These successive levels of aggregation are mirrored in the structure of the electronic institutional portfolio, which will provide one of the interfaces that captures information from ePort, as discussed in more detail below.

While aggregated information will be available to anyone at IUPUI with appropriate administrative access, the ePorts of individual students will be available only to those individuals and groups provided access by the student's permission. ePort is based on an intellectual property model, wherein students "own" their work and faculty "own" their grades and comments. Faculty have the choice of whether their grades and/or comments may be included in students' portfolios, and students have the choice of which artifacts to upload and of who has access to their portfolios.

Another significant aspect of ePort is that it is being developed as an enterprise system. Currently, our technological infrastructure of silos, such as our course management system (Oncourse), our SIS (PeopleSoft), our Digital Libraries, and ePort is being "unbundled," so that all digital infrastructures are accessible to each other through one entry portal, called OneStart. This structure will enable students to transfer learning artifacts, be they text documents, video clips, PowerPoints, graphic slides, or audio clips, from their course management system to their portfolio with one

click. Additionally, information need only be entered once, and any information entered by the Office of the Registrar is automatically entered into the portfolio. For example, the portfolio "knows" the courses, sections, and instructors for any artifacts uploaded through the course management system; the portfolio "knows" and will provide information about the department and school or professional program the student is enrolled in. The diagram below provides a conceptual image of this digital interface:



As the diagram indicates, students enter the IUPUI realm of multiple technological services through OneStart. This portal provides authentication, authorization, and security. It also supplies technological support for managing workflow, communication, and storage. Its goal is to ensure easy access to all technological aspects of students' academic lives.

We are taking both an incremental and a campus-wide integrative approach to implementing ePort at IUPUI, while concurrently providing faculty and student support and encouragement throughout the implementation process. The Center for Teaching and Learning provides funding for faculty, particularly those teaching Gateway Courses, who wish to transform curricular and pedagogical elements of the courses. Part of this curricular transformation includes developing assignments that explicitly integrate one or more of the PULs into required course content. Students will thus have access to a wide range of opportunities to demonstrate their learning achievements in the PULs. In addition, the Office for Integrating Learning is supporting faculty Communities of Practice focused on the PULs, so that faculty can explore, share, and disseminate strategies for explicitly integrating the PULs into their curricula and their assignments. The Office for Student Life and Diversity is sponsoring the Student Task Force working on ways to demonstrate the integration of curricular and co-curricular learning in the portfolio. And University College is

overseeing the introduction of ePort during Orientation and in freshman Learning Communities. Finally, the Office for Planning and Institutional Improvement is assessing the effectiveness of the project on a continuous basis.

We are beginning small, piloting ePort in two of our Thematic Learning Communities (a first-year seminar combined with three or four Gateway Courses). Additionally, the students in the Student Task Force and other interested groups of students from sophomore- to senior-level will be testing the infrastructure. As we ramp up to include all students in first-year Learning Communities, we will also begin to include students in Ivy Tech, our state's community college, and in area high schools for students taking advanced courses at the university level.

One significant feature of ePort is its pending integration with iPort, the IUPUI electronic institutional portfolio. The aggregated information discussed above will be accessible through the Teaching and Learning section of iPort. During the ePort pilot, student volunteers will have the opportunity to link their ePorts with iPort right from the time they begin their portfolio in their first-year Learning Community. We hope to have at least three "Watch My Portfolio Grow" examples linked to iPort by spring of 2004. These portfolios will be accessible over the Internet to everyone who visits our institutional portfolio. Visitors to the "Watch My Portfolio Grow" site on iPort will be able to follow not only the intellectual progress of these students throughout their undergraduate career at IUPUI, but also the evolution of ePort as it develops its functionality beyond the features mentioned here to include a resume builder, knowledge mapper, content manager, research manager, and advising component.

iPort: IUPUI's Electronic Institutional Portfolio

Work on IUPUI's electronic institutional portfolio (iPort) actually preceded the development of ePort by several years. IUPUI began its institutional portfolio in 1998 as part of a national project, the Urban Universities Portfolio Project (UUPP), in which six large, complex urban public universities (California State University, Sacramento; Georgia State University; Portland State University; the University of Illinois at Chicago; and the University of Massachusetts Boston, in addition to IUPUI), collaborated to develop first-generation prototypes for electronic institutional portfolios. The project was sponsored by the American Association for Higher Education and funded by The Pew Charitable Trusts as part of a series of grants that explored the intersection of technology and accountability. The UUPP was the focus of a special issue of *Metropolitan Universities* in September 2002.

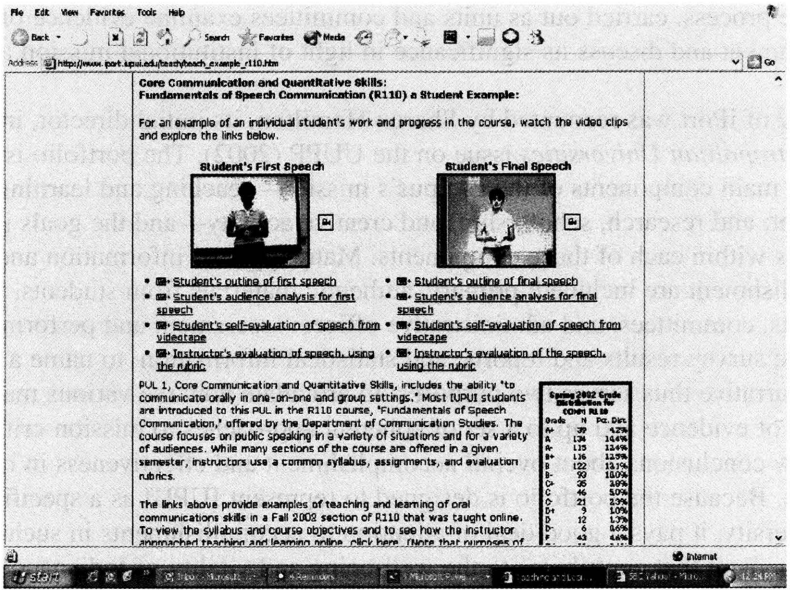
"Institutional portfolio" can be defined as "a focused selection of real work, combined with interpretation and reflection, that demonstrates specific institutional achievements and shows learning and improvement over time—i.e., institutional effectiveness" (modified from Kahn 2001). Like student portfolios, institutional portfolios are built around the combination of authentic work products and reflective narrative. At the institutional level, authentic work comprises not only the work of individuals, but that of groups, such as committees, and of academic and administrative units. Reflection is

a collective process, carried out as units and committees examine evidence of accomplishment and discuss its significance in light of institutional mission and goals.

The history of iPort was recounted by Sharon Hamilton, its initial director, in the special *Metropolitan Universities* issue on the UUPP (2002). The portfolio is organized around the main components of the campus's mission—teaching and learning; civic engagement; and research, scholarship, and creative activity—and the goals identified as priorities within each of those components. Many types of information and evidence of accomplishment are included: primary, authentic materials from students, faculty, departments, committees, and administrative offices; assessment and performance data and reports; survey results and reports; and statistical information, to name a few. The portfolio narrative thus serves two purposes: to articulate how the various materials and pieces of evidence add up to a set of coherent approaches to mission-critical goals; and to draw conclusions about overall accomplishment and effectiveness in relation to these goals. Because the portfolio is designed to represent IUPUI as a specifically urban university, it pays a good deal of attention to accomplishments in such areas as civic engagement that contributes to the well-being and vitality of Indianapolis, research that brings economic and health benefits to the community, and the impact of students and graduates on the city.

Our focus here, though, is on student learning and on how the student and institutional portfolios can work together to enhance, assess, and document individual and institutional achievements related to learning. The institutional portfolio includes materials that document learning achievement at several levels: the level of the individual student; the level of units, such as departments and schools; and the level of the entire institution. Through technological interfaces that allow the student and institutional portfolios to "speak" to one another, the student portfolio will contribute to documentation of learning at each of these levels.

For instance, the electronic institutional portfolio currently includes a range of examples of individual student course work intended to show learning and development over time. In one illustrative example, portfolio viewers can compare assignments prepared by a student early and late in the semester for the Fundamentals of Speech Communication course, a large multi-section course that most freshmen are required to take. Viewers can watch videos of the student's first and final speeches of the semester, and read outlines, audience analyses, and self-evaluations written by the student in conjunction with each of the two speeches. The "value added" to the student's oral communication and critical thinking skills is readily apparent in the comparison of the earlier and later work samples.

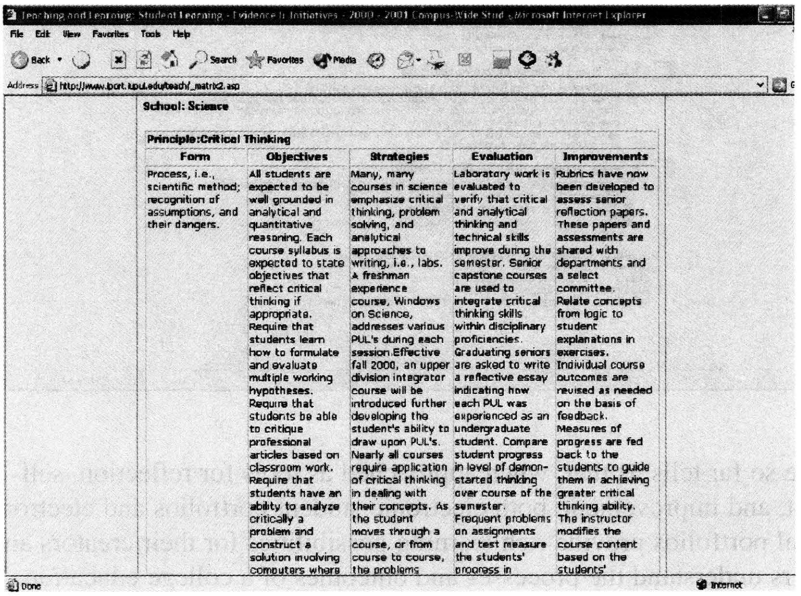


But this example includes more than student work alone. To place this individual student's work in context, viewers can also access the instructor's evaluation of the two speeches, based on a rubric adopted by the entire department for that course. In addition, a grade distribution for all sections of the course taught in the semester from which the example is taken shows how the quality of this "A" student's work compares with that of other students. While the example provides a window into student learning at IUPUI by showing viewers authentic student performances, the assessment of the work and grade distribution information help portfolio readers understand as well what the example represents—i.e., the learning and specific skills of an excellent first-year student.

Examples like this display student learning and its assessment in a powerful and direct fashion. But when the ePort is fully implemented, the university will have, in effect, a database of authentic examples that can be drawn into the institutional portfolio to show the growth of students' intellectual and personal skills over an entire college career, through the full variety of assignments, courses, and majors, and across a range of student abilities, backgrounds, and circumstances. Ultimately, we hope that faculty members, departments, schools, and the entire university will study these examples to gain insight into how well students are achieving intended learning outcomes, in addition to ideas about how to support improved student achievement. At the same time, external stakeholders will have access to a wealth of information, in multiple media, about the work that students do and the ways in which the institution assesses and strives to improve student performance.

At a higher level of aggregation, iPort documents the assessment of student learning at the level of departments and schools. For example, one interactive feature of the portfolio allows the viewer to select a school, select any one of the six PULs, and then see a matrix displaying the school's approaches to teaching and assessing that PUL.

Once ePort is in wide use across the IUPUI campus, we will have the ability to augment this feature with aggregated information about students' levels of competence in the various PULs by department, school, or demographic variables. We will also document strategies adopted by schools and departments to improve learning of the PULs and the major based on assessment findings from ePort.

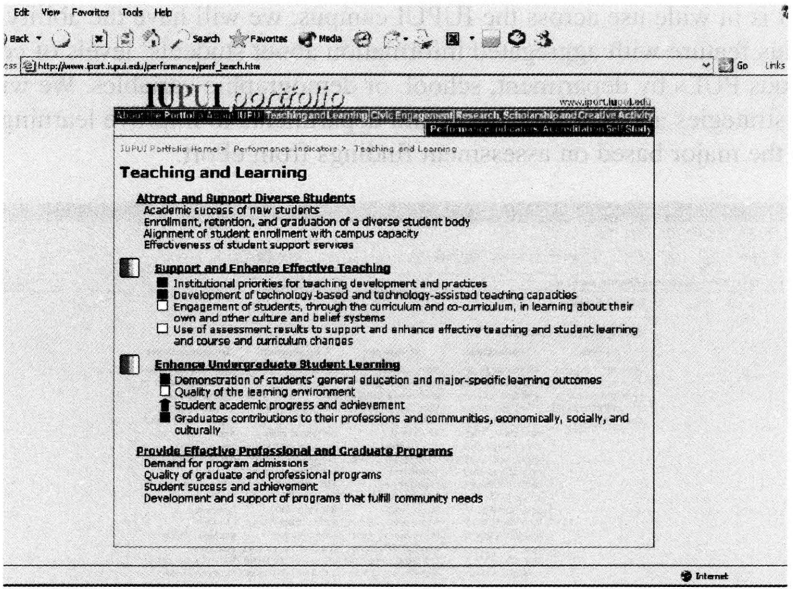


School: Science

Principle:Critical Thinking

Form	Objectives	Strategies	Evaluation	Improvements
Process, i.e., scientific method; recognition of assumptions, and their dangers.	All students are expected to be well grounded in analytical and quantitative reasoning. Each course syllabus is expected to state objectives that reflect critical thinking if appropriate. Require that students learn how to formulate and evaluate multiple working hypotheses. Require that students be able to critique professional articles based on classroom work. Require that students have an ability to analyze critically a problem and construct a solution involving computers where	Many, many courses in science emphasize critical thinking, problem solving, and analytical approaches to writing, i.e., labs. A freshman experience course, Windows on Science, addresses various PUL's during each session. Effective fall 2000, an upper division integrator course will be introduced further developing the student's ability to draw upon PUL's. Nearly all courses require application of critical thinking in dealing with their concepts. As the student moves through a course, or from course to course, the problems	Laboratory work is evaluated to verify that critical and analytical thinking and technical skills improve during the semester. Senior capstone courses are used to integrate critical thinking skills within disciplinary proficiencies. Graduating seniors are asked to write a reflective essay indicating how each PUL was experienced as an undergraduate student. Compare student progress in level of demonstrated thinking over course of the semester. Frequent problems on assignments and test measure the students' progress in	Rubrics have now been developed to assess senior reflection papers. These papers and assessments are shared with departments and a select committee. Relate concepts from logic to student explanations in exercises. Individual course outcomes are revised as needed on the basis of feedback. Measures of progress are fed back to the students to guide them in achieving greater critical thinking ability. The instructor modifies the course content based on the students'

The Performance Indicators section of iPort aggregates data from across the campus to arrive at judgments of the institution's effectiveness in accomplishing each of our mission-critical objectives. In the area of Teaching and Learning, ePort will provide us with a rich source of information for assessing performance on several performance indicators, including "Demonstration of students' general education and major-specific learning outcomes" and "Student academic progress and achievement." Here, we will aggregate ePort information from across the campus to generate evidence to support conclusions about campus-wide effectiveness on these indicators and to inform efforts to improve effectiveness. In this way, iPort both supports and demonstrates institutional learning that leads to greater effectiveness, just as ePort both supports and demonstrates individual student learning that leads to greater competence and success.



Experience so far tells us that, when approached as tools for reflection, self-assessment, and improvement, both electronic student portfolios and electronic institutional portfolios provide rich learning possibilities for their creators and help stakeholders understand the processes and outcomes of a college education. Working together, electronic student and institutional portfolios can comprise a selectively focused, yet richly complex, system of documenting and improving learning processes and achievements. It will probably take IUPUI several years to achieve full realization of these possibilities. Meanwhile, we encourage readers to visit the ePort and iPort web sites frequently (at www.eport.iu.edu and www.iport.iupui.edu, respectively) to watch our progress.

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