

CompetencyWorks ISSUE BRIEF

EXECUTIVE SUMMARY

Re-Engineering Information Technology

*Design Considerations for
Competency Education*

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RE-ENGINEERING INFORMATION TECHNOLOGY: DESIGN CONSIDERATIONS FOR COMPETENCY EDUCATION

Susan Patrick warns in her introductory essay, **Getting Ahead: Mature IT for Competency Education:** “We can’t afford to continue investing in information systems that support the top-down, linear, time-based model. It is important that as a country, at the school, district, state, and federal levels, we design—and demand—information technology (IT) systems and products that support competency-based education.” Our commitment to prepare all of our young people for college and careers demands that we be intentional in designing schools to effectively meet the needs of students of all races, classes, and cultures. It also demands our vigilance in challenging inequity. Our goal in writing this paper is to provide ideas and guidance so that innovators in competency education can put into place powerful systems of supports for students in order to eradicate, not replicate, the inequities and variability in quality and outcomes that exist in our current system.

Re-Engineering Information Technology: Design Considerations for Competency Education provides guidance for anyone interested in taking up Patrick’s challenge and driving further conversations to accelerate the development of robust information systems to support competency education. While competency-based learning and standards-based learning have been important concepts for student-centered learning for decades, not until recently did the capability for intelligent information systems—content management systems, learning management platforms, student information systems, e-portfolio systems, and competency-based grade book programs—exist to help manage the data on how students demonstrate proficiency along a learning trajectory based on competencies.

The current accountability and corresponding data systems are generally structured as a governance function that requires information systems to hold demographic data, student counts, attendance, grade point average, achievement levels, assessment results, and credits, but not competency progression data. In the competency education models emerging rapidly across the United States, the design and architecture of the information systems are flipped to become student-centered and to support student progression through identified sets of competencies. There is no perfect competency-based information system at this time, but there are exciting systems evolving. Nor is there a single approach to designing competencies or implementing competency education. The early innovators developed their own information systems with limited budgets or resources.

At the core of competency education is student demonstration of learning. Ideally in competency education, learning is along a progression of competencies that include:

- a. clearly articulated and granular learning targets for what students must be able to “know and do,”
- b. clear rubrics for how students will demonstrate mastery at each stage,
- c. multiple ways for students to access content and demonstrate mastery, and
- d. dashboards with the data showing the level of proficiency or gaps at each stage along the trajectory.

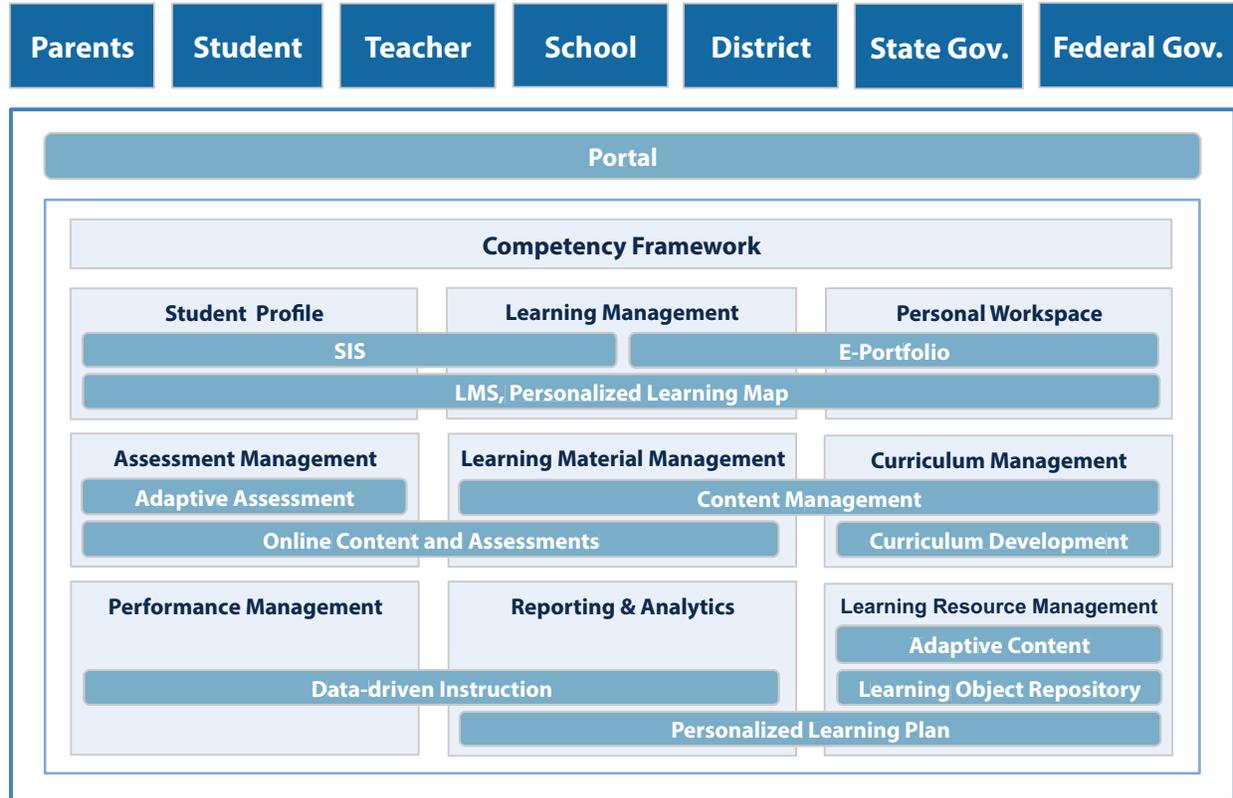
Each student has, in effect, his own personalized learning plan with progress made by demonstrating mastery of competencies. Technical characteristics of this student-centered approach that are built into the information systems include :

- a. providing transparency into what students know and need to accomplish,
- b. robust user tracking and reporting of performance,
- c. differentiated instruction and curriculum, and
- d. options on how students can demonstrate learning.

In the paper, author Liz Glowa analyzes the knowledge of what makes up an effective competency-based information system. While designing competency education systems, it is important to keep student learning at the core, to incorporate interoperability principles, and to use an enterprise architecture approach that enables schools and districts to effectively manage their institutions. These systems need to be able to communicate, and supply the data and support that administrators, educators, and students need in order to know exactly how individual students are progressing based on clear competencies.

After outlining the basics of what an IT system needs to do to support competency education, Glowa explores the facets of designing a system enterprise architecture, components, and capabilities. Using scenarios to introduce the reader to how students, families and educators will use information to drive achievement, the paper outlines the ideal conceptual architecture to support the core functional capabilities:

- Competency Framework
- Student Profile
- Learning Management
- Personal Workspace
- Assessment Management
- Learning Materials Management
- Curriculum Management
- Performance Management
- Reporting and Analytics
- Learning Resources Management



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Figure 2. Competency Framework

The paper concludes with evolving issues, including interoperability, information technology standards for competencies, advances in learning progressions, intelligent algorithms, and adaptive learning, and are complemented by an in-depth appendix.

The storm of new product development to support Race to the Top and Common Core State Standards implementation provides an excellent opportunity to move from time-based systems to competency- and performance-based, student-centric systems.

You can learn more about competency education at CompetencyWorks.org as well as links and materials for all the resources mentioned in the paper on the [Competency-Based Pathways wiki](#).