

SUMMARY OF FINDINGS

Implications of the Survey

Preparing Students for Tomorrow

This survey confirms an important strategic advantage for Illinois – our state has a professional corps of science and mathematics teachers who are interested in keeping their content knowledge up-to-the-minute and willing to introduce emerging technologies in their classrooms.

- 52% were aware of at least half of the 26 concepts.
- Teachers are most familiar with the Biosciences, a growth area in Illinois.
- Once aware, 60% of teachers took the initiative to learn more about new concepts.
- When teachers were knowledgeable about concepts, 66% introduced the new material to students.
- 38% of all participants are teaching at least one of the concepts despite an array of barriers.
- Teachers' comments indicate fundamental commitment to students mastering basic knowledge and skills.

To a certain extent, P-12 teachers are dependent on higher education for both adequate teacher preparation and for professional development. Comparable data showing what higher education faculty know and are teaching their students about the 26 concepts and workforce training on these topics needs to be collected to complete a comprehensive picture of what is happening and not happening across the system.

Defining the “New Basics” in Science and Mathematics

Keeping educational curricula up-to-date is an ongoing process. The “traction analysis” in this report tells us that seven concepts appear to be candidates for inclusion in P-12 curricula – Biotechnology, Alternate Fuels, Graph Theory, Gene Therapy, Natural Products, Green Technology, and Fuel Cell. The interdisciplinary nature of some of these concepts suggests that integration of several sciences and integration with mathematics will be necessary.

At the very least, these findings provide a foundation for conversation among all those concerned about the currency of education in Illinois and its appropriateness for the future. Stakeholders in the dialogue must include educators, researchers, business and industry representatives, parents, community members and policymakers.

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Defining the “New Basics” (continued)

Questions that should concern the stakeholders:

1. Which of the 26 concepts in this survey are really critical for success in Illinois' future? Are some of them fads? Which ones are more immediately important than others?
2. What are the “new basics”? Can the existing fundamentals be covered within next contexts? If not, what topics should be dropped? Which concepts should be covered in more depth?
3. When, at what level, should these new concepts be introduced into classrooms? What is appropriate for grade school students? High school? Higher education? Employees?
4. In addition to content knowledge, what new skills and tools do these concepts require?
5. What will be the new expectations for students along the P-20 continuum; i.e. what must students know at each transition point in order to be fully prepared for the next level?

Overcoming Barriers to Classroom Implementation and Teacher Training

A coherent P-20 process would help to connect the educational system as a whole with needs for workforce and economic development. The barriers cited by teachers have causes far beyond P-12 schools and must be addressed on a system-wide basis.

- Lack of teacher preparation at colleges and universities
- Lack of time to learn about new concepts and time to teach new concepts to students
- Shortage of professional development opportunities, both traditional and online
- Insufficient resources to purchase up-to-date equipment and materials
- Absence of lesson plans and learning activities related to new concepts
- Local curricula and textbook adoption processes that discourage innovation
- State standards and assessments that need to be updated
- Accountability systems that do not reward innovation
- Disconnects between education and needs for economic development

The findings of this survey present an opportunity to redesign curricula and the educational delivery system in ways that will bring vitality to both the educational system and the economy. As a result of these efforts, Illinois educators will be better positioned to prepare future scientists, technologists, engineers, and mathematicians to meet the challenges of both the global marketplace and citizenship in the 21st century.