Early STEM Exposure Through Career-Focused PBL
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Today’s Presenters

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Kankakee School District

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Kankakee School District
Agenda

- Preparing students for college, careers and life starting in kindergarten
- How district leaders coached their administrators teachers to think past the traditional style of teaching and make the shift to PBL
- Resources and professional development to support deeper learning
Kankakee School District, Illinois

KSD Key Stats

- 5,000+ students
- 11 schools
- over 300 teachers
Kankakee’s Vision and Goals

**Vision:** KSD will be recognized as being progressive, innovative and creative. We work together to build ONE community with strong partnerships. We are ONE district committed to increasing student achievement. We have ONE vision of producing globally productive citizens. We do this for the diverse needs of ALL children.

**Goals:** In order to prepare our students for college, careers, and life in an rapidly-changing economy, KSD will:
- Implement its own district learner accountability measures for its graduate outcomes
- Provide a learner-centered environment accessible to all
- Broaden our partnership with local business to create educational opportunities
Kankakee School District Today

- College Career Academy Classes
  - Introduced 16 different STEAM career paths to about 70 percent of our K–5 students
- Competency based learning model
- Increased dual-enrollment options AP and Dual Credit
- Partnerships with over a 100 local businesses
How We Got Here -
The Impetus for Change
Kankakee School District in 2015

➢ Low Student Achievement
  • Less than 50% of students grades 2-9 met expectations on local assessment
  • 10/11 schools fell under 50% of students meet/exceeding on state testing
    • Graduation rate 69%
    • College ready 22%

➢ Lack of Community Support

➢ Low Student Engagement
## Preparing the Students for Future Workforce

### Top skills desired by employers by 2020

<table>
<thead>
<tr>
<th>In 2015</th>
<th>In 2020</th>
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<tbody>
<tr>
<td>1. Complex Problem Solving</td>
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<tr>
<td>2. Coordination with Others</td>
<td>2. Critical Thinking</td>
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<td>3. People Management</td>
<td>3. Creativity</td>
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<tr>
<td>5. Negotiation</td>
<td>5. Coordination with Others</td>
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<td>6. Quality Control</td>
<td>6. Emotional Intelligence</td>
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<td>7. Service Orientation</td>
<td>7. Judgment and Decision Making</td>
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<td>8. Judgment and Decision Making</td>
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<tr>
<td>9. Active Listening</td>
<td>8. Service Orientation</td>
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<td></td>
<td>10. Cognitive Flexibility</td>
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Source: Future of Job Report, World Economic Forum
Early STEM Exposure: Key for the Future Workforce

Research shows children exposed to STEM education at a very young age perform better in science and math than students who are not.

Growing number of studies show correlation between early experiences with STEM and success in those subjects later in life.

Builds the critical 21st century skills students need for future success: critical thinking, communication, collaboration and creativity.
Student Engagement: Choice and Decision-Making

- Choice in topic, resources, how to present findings
- Ways of responding to the task
- Planning and management of information/data and ideas
- Self-assessment, peer and teacher feedback, and revision

Performance Assessment Quality Criteria

These criteria aim to communicate design principles for the creation of quality performance assessments. Performance assessments ask students to think and to produce—to demonstrate learning through work authentic to the discipline and/or real world.

Quality performance assessments have the following characteristics:

Clear and Worthwhile Performance Outcomes
- Require developmentally appropriate integration and demonstration of disciplinary understandings, language, and practices
- Are tightly aligned to content, language, and practice standards and other learning outcomes
- Make connections to the big ideas and/or enduring understandings of the course and discipline
- Are assessed using scoring criteria that address the targeted content and language learning outcomes
- Are clearly defined, measurable, and reasonable in quantity for the task duration and purpose

Task Focus, Clarity and Coherence
- Task prompt is focused and asks students to demonstrate mastery of disciplinary understandings, language, and practices
- Task prompt, directions, and criteria for scoring are clear, accessible, and unambiguous

Performance Assessment Quality Criteria was authored by Stanford Center for Assessment, Learning, & Equity (SCALE).
School District Transformation
KSD’s Transformation

- Transformed Kankakee’s general education track into the College and Career Academy
- 100% focused on using with PBL and CBE to prepare students for future jobs
- All students do 4 large scale career-focused STEM projects throughout the year

- Collaborated with local businesses
  - CSL Behring
  - Nucor Steel
  - Kankakee Economic Alliance
  - Illinois Jobs for American Graduates
Next Steps for KSD

- Kankakee and Defined Learning will partner with local businesses to include these businesses in the options at secondary level

- Systematically increase local business partners

- Move CBE to entire high school with a strong emphasis on career goals
  - Survey student career interests beginning at 6th grade
  - Move to Competency-Based Education (Freshman)
  - Redesigning classroom spaces
  - Infusing technology into instruction (Learning Any-time, Anywhere)
How We Implemented Successful Change
From Traditional to PBL Model

Shifted to career-focused project-based learning model to expose students to STEM learning starting in kindergarten

Why PBL?

- Gives students a deeper understanding of STEM concepts
- Provides opportunities for students to apply their knowledge and skills to real-world problems
- Builds the critical 21st century skills students need for future success: critical thinking, communication, collaboration and creativity
Curriculum and Instruction

➢ Moved from teachers as facilitators to teachers as activators
➢ Focused on student engagement
➢ Provided opportunities to connect content to meaningful application
➢ Moved from curriculum writing/planning to design
Leveraging Resources in KSD

➢ Return on Investment
➢ Micro-credentialing
➢ Authentic Performance Tasks
➢ Utilized and developed experts within our District
➢ Example: PD opportunities through Defined STEM
Real-World Performance Tasks

➢ Connect classroom content to career pathways through performance tasks that are based on situations in STEM careers
➢ Provide opportunities for students to apply their knowledge and skills to solve real world problems
Measure Progress of Critical 21\textsuperscript{st}-Century Skills
Classroom Environment in KSD
Video: STEM Learning Through PBL at KSD

Meaningful Learning Experiences
Impact on Student Achievement at KSD

Since we implemented our PBL and competency-based model, data shows that in one year (2016 to 2017):

➢ Reading comprehension scores increased +8%
➢ Math application increased +9%
➢ Increased student engagement in all of our K–6 classes
➢ Built partnerships with local businesses and industries that support students’ exploration and curiosity about future career options
More on Defined STEM
Connecting Classrooms to the Real World

Defined STEM’s real-world performance tasks put the students in the role of a specific STEM career and asks them to conduct a performance task that follows the GRASP (Goal, Role, Audience, Situation and Product) model based on the Understanding by Design (UbD) framework by Jay McTighe and Grant Wiggins.
Empowering Educators to Measure Students’ Progress of Important 21st-Century Skills
A case study of a large school district by MIDA Learning Technologies showed that after utilizing PBL through Defined STEM, teachers saw improvements in students’ engagement and motivation.

Assessments revealed that 2nd and 5th grade students who used PBL by Defined STEM outperformed their peers who received traditional instruction by over +5 points.
Empowering Educators to Bring STEM Learning to Life

- **Curriculum Solution**: Defined STEM - Authentic career-focused performance tasks, literacy tasks and real-world videos
- **Assessment**: Project & Portfolio Manager - A framework for assessing students on standards/competencies to measure student growth over time
- **Customization**: Personalized Learning - Tasks, products and assessments customizable to meet the needs of all learners
- **Professional Development**: PD Opportunities - In-person and online PD opportunities to help teachers implement effective PBL in the classroom

Connecting Classrooms to the Real World
Video: Insights from Defined STEM Teachers
Video: Defined STEM Impact on Student Engagement
Questions?

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Thank you!