

Assignment 3: Technology Implementation Plan

Remberto Jimenez

Stephanie Talalai

Jennifer Vanyi

New Jersey City University

## **Introduction**

The South Brunswick School District (2016), notes that their mission is to prepare students to be lifelong learners, critical thinkers, effective communicators and wise decision makers. The school district notes how this will be accomplished through the use of the New Jersey Student Learning Standards (NJSLS) at all grade levels (South Brunswick School District, 2016). Furthermore, the district notes how they will maintain an environment that promotes intellectual challenge, creativity, social and emotional growth and the healthy physical development of each student (South Brunswick School District, 2016).

Despite the blue-ribbon status of the school district and the recent implementation of various STEM programs, the school district has expressed its desire to increase achievement in mathematics. This is not surprising based on recent standardized tests scores across the district and in the state of New Jersey. To further compound the problem, the lack of proficiency in mathematics is not a localized phenomenon. According to the U.S. Department of Education (2016), “only 16 percent of American high school seniors are proficient in mathematics and interested in a STEM career.” Moreover, across the globe, the United States currently ranks 25th in mathematics and 17th in science. K-12 educators face many challenges as they try to not only get students excited about STEM, but also increase student achievement in these crucial disciplines (Pearson Education, 2016). Therefore, to support further academic achievement in mathematics, the district will implement the Pearson tool: SuccessMaker.

### **About SuccessMaker**

SuccessMaker is educational software that differentiates and personalizes K-8 reading and math instruction (Pearson Education, 2016). SuccessMaker provides instruction, practice, and assessment that is well-correlated to Common Core Standards for both mathematics and language arts at all grade levels of the program (Pearson Education, 2016). Pearson School (2016) notes that SuccessMaker is an adaptive and prescriptive scheduling intervention program delivering both reading and math curriculum. Moreover, the SuccessMaker tool is designed to accommodate varying learning styles and learner needs for special education, gifted, at-risk and English language learners; the focus is on the individual needs and desires of real students and educators (Pearson, Education, 2016). The program provides about 43 instructional hours for each grade.

For the district's goal to improve mathematical performance among the students, we will specifically implement the Mathematics portion of SuccessMaker for the 2017 rollout. The district will explore the Language Arts portion of SuccessMaker and await 2016-2017 PARCC scores to determine future fit and relevance post implementation of the Mathematical module of SuccessMaker (Pearson School, 2016)

### **Key Features**

According to the SuccessMaker Adaptive Coursework (n.d.), SuccessMaker's research foundations go back to the pioneering work on intelligent tutoring and artificial intelligence led by Professor Patrick Suppes at Stanford University. A guiding idea of this work is to develop a structured, comprehensive, and deep curriculum, to be presented to the individual learner in the manner and the rate best suited to that learner, as determined by the learner's responses to the

system (SuccessMaker Adaptive Learning, n.d.). This approach is key to providing just-in-time interventions for students based on their performance with SuccessMaker. Stealth formative assessments adjust instruction with every click, swipe, and student response. Moreover, this approach will enable learners, regardless of whether they are classified as gifted and talented, at-risk, or ELL, to follow individual learner paths that will guide the student to targeted performance goals. Therefore, students can move at their own pace while achieving key milestones that the instructor can monitor via the instructor SuccessMaker dashboard.

One unique feature of SuccessMaker adaptivity is that within any single student courseware session, students will receive a mixture of different types of items instead of a series of similar items. This mixture of items helps to maintain student interest over the course of the session since the student cannot predict what type of question will come next, minimizing tedium. The mixed presentation of items across strands also limits rote memorization and increases long-term retention since the student will experience the item over a longer duration (generally several sessions) helping to move the item from short-term memory to long-term memory.

Skill mastery determination is evaluated after every attempt and incorporates the number of attempts, pattern of attempts (where more recent attempts receive greater weight) and use of supports. That way students spend only as much time as needed to represent mastery and to move on to additional content in a highly efficient manner as performance dictates. Again, the goal is to challenge the student without frustrating him, and thereby to keep him engaged in the courseware.

From a tech perspective, SuccessMaker is software as a service (SaaS). SuccessMaker is browser-based, and students can access the program at school and on personal devices at home,

including Android and Apple devices. This means that students don't have to install software to a computer to access SuccessMaker. Using their student credentials, students can access SuccessMaker via any device, including phone, tablet, or PC.

SuccessMaker is written in HTML5, is Java free and fully mobile, uses gamification methodologies towards student engagement and motivation delivered through new characters, environments, and rewards, and more personalized practice aligned with core programs. It includes enVisionmath2.0. enVisionmath2.0 (2016) is a program offered by Pearson Education that is aligned to the Common Core and offers a comprehensive mathematics curriculum for Grades K-5. It offers the flexibility of print, digital, or blended instruction. enVisionmath2.0 provides the focus, coherence, and rigor of the Common Core State Standards. Project-based learning, visual learning strategies, and extensive customization options empower every teacher and student.

### **How it works For Students (K-8).**

SuccessMaker for students begins with the level designated by the placement test or teacher. The curriculum develops a personalized learning path for the student that continuously adjusts based on student performance. Students rotate between practice exercises, tutorials, and games. Both the reading and math activities begin with material at the student's level as designated by the assessment or the student's teacher.

The program uses songs, videos and animated characters to present information to students. SuccessMaker gives students some control as they interact with the program such as the ability to choose characters that they use through activities and create drawings or animations on

the screen to increase engagement. At the end of each session, students receive a daily progress report with a total number of questions answered and the percentage answered correctly.

Rather than tests, the program uses student performance data to indicate progress. Pearson recommends that students engage in 3-4 sessions totaling 60 minutes of instruction per week and at least 20 hours per year. SuccessMaker has tools to adapt instructional methods for English Language Learners (ELLs). Also, Pearson Education (n.d.). ChartML technology is now included to assist visually impaired students.

### **How it works For Students (Grades 9 - 12)**

For students that are performing below 9th grade in terms of their math proficiency, they can utilize the SuccessMaker tool to build their knowledge and skills. For students performing at a 9th grade or higher in terms of their math proficiency, they will have access to the Pearson Integrated High School Mathematics Common Core software. It is another adaptive tool created by Pearson that also provides the same benefits as SuccessMaker. The difference is the Pearson Integrated High School Mathematics Common Core Software can be accessed via student devices including IOS and Android. For the purposes of this proposal, we will refer to the overall software (SuccessMaker and Pearson Integrated High School Mathematics Common Core) collectively as SuccessMaker.

### **How It works for Diverse Learners, English Language Learners and Students with Special Needs.**

SuccessMaker starts by evaluating each child's skills. Based on the results, each child receives tailored exercises in his or her areas of weakness. SuccessMaker Math presents

individualized interactive lessons which are adaptable so that each student can reinforce weak skill areas and understand basic math concepts. Many students who have learning disabilities need additional support and assistance to help them learn. The programmed instruction includes instructional scaffolding, multimedia presentations, and basic math foundations. SuccessMaker Math meets the student where he or she is and moves each forward into higher levels of math (Pearson Digital Learning, 2003).

SuccessMaker has an accessibility feature which will read aloud descriptive text for the question or math problem if a screen reader is installed on the student's computer making it accessible to visually impaired students as well as students with print disabilities. Accessing the SuccessMaker program through a mobile device allows for students with mobility issues to be able to position the device at an optimal angle for access.

Students with learning disabilities often struggle with tests and assessments because of comprehension difficulties, attention deficits, and test anxiety. After 300 initial placement problems (IPM), the SuccessMaker program automatically places students at their functional level. A student's placement at the correct level of difficulty is based on the student's actual work, not on placement tests. This makes placement invisible to the student and occurs without the anxiety of testing.

### **How It Works for Teachers and Administrators.**

Teachers can set the level a student starts at and manually readjust their learning path as necessary. Because SuccessMaker is a supplemental education program, in some schools a teacher other than the student's classroom teacher may manage the SuccessMaker program and provide information about performance to the child's classroom teacher. SuccessMaker can

generate reports that track mastery by academic standard or skill. Skills are flagged green, yellow or red according to the student's mastery level. A few of these reports include:

- Student Performance Report (SPR)—Overall average, overall percentage, average time on task
- Areas of Difficulty (AOD) —Specific areas of difficulty for that student
- Cumulative Performance Report (CPR)—Level of each strand, current level, and gains
- System Enrollment and Usage (SEU)—Time on task and number of sessions

Reports can be filtered by demographics including learning disability, English proficiency level, race/ethnicity and socioeconomic status. Data from these reports can be exported to spreadsheet programs, such as MS Excel, as comma separated value (CSV) files for further analysis.

### **Cost and Funding Sources**

In terms of the costs associated with SuccessMaker, the unit cost per license is \$20 for one school year. With over 9100 students enrolled in the school district, and 49 math teachers in the middle school and high school, and 194 teachers in the remaining elementary schools, SuccessMaker would require a minimum investment of \$186,860.00 (Totals Users (9,343) \* Unit Cost (\$20.00)). This would include all students, math teachers, and elementary school teachers in the district.

In addition, Pearson offers and recommends the following additional options to include for professional development. SuccessMaker professional development offerings include the following packages for one school year.

- 3-day Implementation Support (at \$1700 per day = \$5,100.00)
- Data Management and Reporting (\$200 per School = \$2,200.00)

- 10 Onsite Professional Development sessions for the district (\$1700 per day = \$17,000.00)
- One School Year Tech support via phone/chat for all schools in the district (\$2,500.00)

These additional services are recommended and will support the overall implementation and usage of SuccessMaker across the district.

**Summary Costs**

| Quantity         | Service/Product                             | Unit Costs | Total Costs  |
|------------------|---|------------|--------------|
| 9,343            | SuccessMaker Enterprise Level License       | \$200.00   | \$186,860.00 |
| 3                | In Person Implementation Support            | \$1,700.00 | \$5,100.00   |
| 11               | Data Management and Reporting               | \$200      | \$2,200.00   |
| 10               | Professional Development                    | \$1,700.00 | \$17,000.00  |
| 1                | One School Year Tech Support via phone/chat | \$2,500.00 | \$2,500.00   |
| Total Investment |   |            | \$213,660.00 |

From a cost perspective, South Brunswick school district will apply for the following grants to support the costs of implementing SuccessMaker across the district: IDEA, School Improvement Grants, Title I, Title III, and 21st Century Community Learning Centers. There are currently 11 schools in the district, including two middle schools and a high school. According to Pearson, more than 50% of customers use Title 1 funding to purchase the program. The State of New Jersey (2016) notes that of the eleven schools in the district, Brunswick Acres, Constable, Crossroads South, Brooks Crossing Elementary, and Greenbrook Elementary are

classified as having received Title 1 funding. (State of New Jersey, 2016). In addition to Title 1 funding, the South Brunswick school system will apply for the following grants to further supplement implementation costs. IDEA, School Improvement Grants, Title III, and 21st Century Community Learning Centers. The South Brunswick school district technology plan will also be updated to include the use of SuccessMaker across K-12 and allocation of funds towards license and implementation costs.

Once a SuccessMaker license is purchased, it does not expire and there is no annual fee beyond the initial purchase. However, in order to use the most recent version of the product when an update is released, schools and districts must purchase an upgrade. Annual allocation for the purchase of new licenses/upgrades must be included as part of the district's ongoing budget.

From a hardware perspective, South Brunswick has already made previous upgrades as part of its 2013-2016 technology plan to support Wi-Fi and BYOD capabilities across the district. Moreover, South Brunswick School BYOD (2016) policy notes that investments have been made in Chromebooks for the district. Moreover, the BYOD policy currently only allows students in grades 6 - 12 to participate in the BYOD program (South Brunswick School BYOD, 2016). Therefore, laptop allocation will need to be examined to make sure that there are sufficient Chromebooks, in grades K-5 to cover every student. Students in grades 6-12 will be given the option to register for BYOD access and use their devices to access SuccessMaker. Backup Chromebooks will be needed for students who do not register for BYOD and or experience device failure or problems while in class.

## **Implementation of Pearson SuccessMaker**

### **Goals and Objectives**

Implementation of the SuccessMaker Software is directly linked to South Brunswick

Technology Plan Goal #6:

The District will identify classroom technology (hardware and software) that is necessary for program implementation.

Objectives:

- The strategic distribution plan will be updated to include the optimal classroom prototypes for grades 3-5 classrooms and for identified middle and high school departments.
- The ARRA-funded and assistive technologies will be studied to determine effectiveness and a plan will be developed for systematic refreshing, training, inventorying and upkeep.
- To better address District needs, the Bring Your Own Technology/Devices model policy will be studied and considered for implementation in South Brunswick.
- A plan for shared printers in the classrooms will be developed.

Software implementation will benefit all students in all 11 South Brunswick Schools.

### **Identifying the SuccessMaker Implementation Team**

The effective use of SuccessMaker crosses several administrative areas such as IT and Curriculum. The South Brunswick school will utilize a district implementation team to facilitate communication and support for the project across departments.

The team will include:

- Superintendent
- Assistant Superintendent of Curriculum and Instruction
- Principals
- Director of Professional Development
- Director of Assessment
- Technology Director
- Technology Staff Developer
- Elementary School Technology Coordinator
- Elementary School Tech Educator
- Middle School Technology Coordinator
- Middle School Tech Educator
- High School Technology Coordinator
- High School Tech Supervisor
- Library Media Specialist
- Elementary School Teachers
- G&T Teachers
- Middle School Teachers
- High School Teachers
- English Language Learners (ELL) Teacher
- Special Education Teacher
- Director of Student Services
- Technology Department Staff
- South Brunswick Board Member
- Administrative Assistants
- Parents
- Students
- Community Member- South Brunswick Public Library

(South Brunswick School District Technology Plan, 2013-2016)

The Project Leader will:

- Establish timelines for various phases of the project.
- Arrange for and monitor teacher and student training with the assistance of the Director of Professional Development.
- Provide additional in-classroom and in-service training with the assistance of the Technology Staff Developer and Technology Coordinators.
- Troubleshoot problems as they arise with the assistance of the Technology Director and Technology Department staff.
- Communicate with appropriate staff about students with Individual Education Plans (IEPs) include the use of SuccessMaker as an accommodation with the assistance of the Director of Student Services.
- Ensuring that project goals are being met.
- Collecting and compiling evaluation data with the assistance of the Director of Assessment.
- Providing regular updates to the implementation team and general community about the project's progress.

### **Purchasing Software and Hardware**

The South Brunswick IT specialist will discuss the software needs of the district and review technical requirements of the software a Pearson representative recommending the most cost effective software configuration for supporting as many students as possible and ensuring that the software is compatible with the existing hardware and network configurations.

Purchasing the web license-based software, since it provides the greatest flexibility for student use will be considered.

### **Installing Software**

- Software installations and ongoing technical support post-installation for teachers and students will be provided by the South Brunswick IT department lead by the Director of Instructional Technology.
- The web-based software will be ready to implement prior to all training dates.
- Minimal time will pass between training and the availability of the SuccessMaker software in classrooms in an effort to keep teachers motivated.
- All installations will be tested to make sure that the software works and that network sharing is operative so teachers (and students) don't encounter technical glitches when they start to learn and use the software.
- Account creation and management will also be managed by the IT Department.

### **Training, Consulting, and Support**

Delivering SuccessMaker Training is an ongoing process. Experience shows that in addition to formal training, teachers and students need follow-up/refreshers training to become proficient with all aspects of the product. They also require support and some initial classroom handholding to integrate the software into their daily curriculum. An IT specialist will be included in the initial training to provide on-site support for minor technical problems.

- A calendar of all training sessions, both staff and students will be provided.
- Training will be provided via SuccessMaker online training, in-services, and after-school workshops.

- Initial training for staff will be provided by Pearson for faculty.
- Once trained, teachers, paraprofessionals or fellow students can train students.
- Agenda topics will be prioritized according to project goals and objectives, and staff (and subsequently students) will be trained at regular intervals. This enables teachers and students to learn key skills and immediately apply what they have learned in the classroom.
- Teachers and students will be given specific assignments to complete to help them start using the software in the classroom.
- On-site/in-classroom follow-up will be scheduled following training.

### **Using SuccessMaker with Other Tools**

All students, regardless of their differing learning styles and abilities, need access to the curriculum. Students will be given the opportunity to use SuccessMaker by itself, or in conjunction with other technology such as voice recognition; digital whiteboards; and alternative keyboards, computer access, and augmentative communication devices. This allows teachers to provide all their students with access to the curriculum as well as integrate universally designed teaching techniques into their classrooms.

### **Disseminating Knowledge**

Experience shows that a little knowledge goes a long way. In addition to the professional development provided on SuccessMaker, the school system will utilize various platforms to disseminate and share knowledge. This includes weekly newsletters, staff in-services, special

interest groups (SIGs) and listservs, for teachers to share Success Maker tips, techniques and information with their peers throughout their school and school system.

### **Supporting Theory**

The ideologies that inform adaptive learning systems are rooted in a variety of social and learning theories. Connections can be made with behaviorism, recalling elements of B.F. Skinner's 1950's era "teaching machine" for programmed instruction as both involve measuring behavior objectively through reinforcement of correct responses. Both behaviorism and adaptive learning assert that truth can be established by the examination of facts and that prediction of behavior can be used to manipulate future behaviors (Boghossian, 2006).

While these traces of behaviorism exist, there are also tenets of Constructivism in adaptive learning. Piaget's assertion that learners construct their own knowledge is demonstrated in the personalized learning aspects of programs like SuccessMaker. And while these theories tend to be mutually exclusive, the active participation in personalized learning also lends itself to constructivism. The learner constructs meaning through interaction with the various learning activities, the consequences of those interactions and through reflection on those processes.

Seymour Papert (1980) spoke of both adapting instruction to learners' background, goals, preferences and prior knowledge and of using technology to provide that adaptation for the infinite variations and preferences of its users. Papert (1980) envisioned "the child programming the computer," and he believed that computers could be a powerful tool for students to construct their own knowledge. He called computers the "Proteus of machines" (1980), comparing technology to the classic mythological sea god who could assume different forms. Papert adapted Piaget's theories of constructivism to create his own theory- constructionism ("Educational

Robotics and Constructionism [Papert],” n.d.). His ideas of student-centered instruction speak to the personalized nature of the adaptive learning programs.

Another notable pioneer in adaptive learning systems and computer-aided instruction was Patrick Suppes. He is credited with developing the first computer-assisted instruction system in the 1960s while at Stanford University (“Meet the Influencers,” 2015). His experiments in this area led to his formation of the Computer Curriculum Corporation (CCC) in 1967. This company is now known as Pearson Education Technologies. His idea of computerized “tutors” for individualized learning and increased educational productivity (Taylor, 1980) directly led to the future creation of SuccessMaker.

### **Supporting Research**

Research regarding the use of systems such as SuccessMaker and the related Pearson products can be found using a variety of descriptive terms: adaptive learning, differentiated learning, personalized learning, advanced learning technologies, intelligent tutoring systems (ITS), and learning management systems. A review of the literature found articles both on the purposes for adaptive learning systems and studies which support their use in K-12 schools.

Peter Burrows (2016) notes that adaptive learning is expected to do the following: save time, customize feedback empower students and collect and analyze data. In an *EdSurge* special report, he describes how the use of adaptive learning allows for student agency and responsibility in their own learning for all learners, in addition to remediation and differentiation (2016).

Burrows (2016) also notes some fundamental questions presented when looking at these types of learning programs:

- Do these systems allow for higher engagement levels in presenting content than traditional methods?

- Does sequencing of concepts or skills make a significant difference?
- Can assessment be used in a more meaningful way, not only rank students but to help struggling learners to succeed?
- Can a digital curriculum help close achievement gaps?

A 2014 study by Yildirim, Reigeluth, Kwon, Kageto and Shao found that learning management systems (LMS) match functions that are needed for our current information age paradigm of education. They argue that characteristics such as customization, diversity (as opposed to uniformity), student initiative, self-direction, and collaborative relationships found in learner-centered programs allow for educational needs of today's society to be addressed (p. 721). After studying a variety of LMS platforms, they concluded that programs need to be truly systemic to integrate all the noted characteristics. They also need to support collaborative learning in and out of school, and not require extensive training to be effective (p. 734).

Suppes, Holland, Yu & Vu (2013) conducted a study on an individualized, computer-driven online math course. They found that the inherent active engagement and the adaptations suited to individual student levels contributed significantly toward positive changes in learning when compared to the control group. An investigation by Angus & Watson (2009) determined that exposure to regular online Math testing significantly improves student learning. This finding was especially noteworthy as the result was independent of student performance on assessments. In other words, even the learners who did not generally perform well on the online still showed gains in overall learning.

Another study on adaptive learning systems in mathematics shows improved accuracy and decreased response times for writing mathematical expressions (Walkington, 2013). Collins and Halverson (2009) state that the element of customization can fundamentally change the

relationship between the learner and the content with which the learner is presented. Lastly, a study by Henley (2003) finds that 92 percent of those surveyed found that online assessment helped learning while only six percent disagreed with that statement.

### **Accountability and Project Evaluation**

A well-thought-out assessment plan with pre- and post- data which incorporates goals is important for measuring the success of the project. To determine the impact of the Pearson products on standardized test results, as well as the effectiveness of related technology implementation and curriculum components, careful data analysis should be conducted.

Assessment is also important for obtaining valuable feedback to assure that the needs of teachers and students are being met. Additionally, continued project funding often depends on having reliable data regarding student progress.

The following will be included in the assessment plan:

- Evaluation criteria (i.e., for the district, schools, teachers and students) and reporting schedule laid out in the action plan.
- A data collection sheet for teachers to enter pre- and post- student data whenever formal report cards are issued or common assessments are given.
- Data from state-mandated assessments, disaggregated not only by school but by classroom and specific groups of students, with a detailed analysis of results by objective or skill in addition to overall scores, will be examined and compared to previous years' results.

- Analytical assessment of skill gap data from both pre-program implementation and post-program implementation will be conducted to determine whether the Pearson products more fully incorporate core skills.
- A questionnaire to be periodically completed by teachers and students using the program to see how useful the program is as well as identify any problems or concerns.
- For students with documented disabilities, a review of student's' IEP goals.
- Longitudinal data from a minimum of three years may be collected and analyzed to determine the impact over time.

It's essential to make sure all stakeholders – administrators, teachers, students and parents – are kept informed about the progress students, teachers, schools and the district are making and the value they are receiving from using SuccessMaker. Be sure to provide students and staff with plenty of opportunities, both formal and informal, to demonstrate SuccessMaker and the progress being made.

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