USING ISTATION TO IMPROVE READING COMPREHENSION IN ELEMENTARY SCHOOL CLASSROOMS

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Importance of Reading

- One of the fundamental skills for students to master in order to achieve academic success in all disciplines

- Reading comprehension as an essential skillset requires more than just the reading of words; it is part of scheme building (Ertmer & Newby, 2013; Jonassen, Campbell, & Davidson, 1994; Pikulski & Chard, 2005)

- Quality reading experiences and practices at an early age exert pervasive effects on literacy outcomes (Bowman, Donovan, & Burns, 2001; Strickland & Shanahan, 2004).

- Early teaching of reading skills needs to be a child-centered, developmentally appropriate practice that matches the child's developmental stage (Charlesworth, 1998).

Reading Strategies

- Variable, differentiated, and personalized instruction is key at an early age (Kelcey & Carlisle, 2013 ; West, Denton, & Reaney, 2000).

- Develop effective natural reading strategies: **previewing** a story's cover to identify its genre, **skimming** the pages of the text to identify the text structure, and reading actively to construct and revise predictions

- Observing good reading behavior (Duffy, 2002).

- Use of graphic organizers (Ae-Hwa, Vaughn, Klingner, Woodruff & Reutebuch, 2006)

- Provide struggling reader with corrective feedback and repetition (Burns, Riley-Tillman, & VanDerHeyden, 2012; Rathvon, 2008; Samuels, 1979).

Computer-based Technologies for Reading

- Provide visual aids by seamlessly inserting images and photographs as well as modifying layout and presentation of content based on the particular needs of a student (Reinking & ChanLin, 1994).

- Provide individualized support that facilitates personalized learning (Hutchison, Beschorner, & Schmidt-Crawford, 2012; Hutchison & Beschorner, 2015).

- Incorporate assessment mechanisms useful for gathering student data.

The IStation Reading Program

- An adaptive computer-based reading program that adapts to the learner's academic needs.

- Areas of concentration:
  - *phonemic awareness*
  - *Phonics*
  - *fluency*
  - *Vocabulary*
  - *comprehension*

(IStation, 2015)

Source: http://gen2oh.net/welcome/timelesstales/isdmetpmtimelesstales/

Research on IStation

- IStation has been utilized by over three million students in more than 37 states in the U.S., and six countries world wide to improve their reading skills (Patarapichayatham & Roden, 2014).

- State of Texas

- Aid third-graders in improving their Language TEKS (Texas Essential Knowledge and Skills) test scores; Results correlated directly with the IStation interactive lessons and activities which promoted decoding, vocabulary, fluency, as well as oral and written conventions

- More predictive of the TAKS (Texas Assessment of Knowledge and Skills) reading assessment scores than other traditional standardized tests

- High correlations were exemplified in the IStation Reading tests and STAAR (State of Texas Assessments of Academic Readiness) reading assessments.

Research Questions

1. Did students' STAR scores improve during IStation's implementation?

2. Was there a significant correlation between IStation scores and STAR Reading Test scores?

3. What were students' perceptions towards IStation as a tool to support reading comprehension?

4. What were the instructor's perceptions towards IStation as a tool to support reading comprehension?

Research Design

- Mixed Methods case study research approach

- Quantitative: correlational analysis

- Qualitative analysis of student and instructor perceptions via in-depth interviews and surveys

Participants

- Participants
  - *98 public school third-grade students in an urban elementary school in the southeastern United States.*
  - *a convenience sample consisting of 51 girls and 47 boys across three classes*
  - *Prior to the implementation of IStation, the three tiers (high -Tier 1, medium- Tier 2, or low-Tier 3) from high to low consisted of 18, 37, and 43 students*
  - *A stratified sample of 9 students selected across all three classes were invited to participate in student interviews*
  - *3classroom teachers participated in this study*

Procedure and Instruments

- All students participate in the IStation reading program as part of their normal education.

- Students completed one 30-min IStation lesson per day at a minimum.

- The STAR Reading Test was taken on a monthly basis to gauge students' success on state-level standardized tests

- Prior to IStation's implementation, teachers received an hour-long, on-site, face-to-face training session from IStation representatives.

- A pre-survey for teachers was conducted to examine their initial interest and belief before the program's implementation; a post-survey was conducted after implementation.

- Researchers chose one Tier 3, Tier 2, and Tier 1 student from each of the three different classes to interview after implementation.

Data Analysis

- Phase 1 (Quantitative)
  - Pearson R correlational analysis of monthly STAR Reading Test and the IStation program
  - Teacher pre- and post- surveys

- Phase 2 (Qualitative)
  - Teacher interviews
  - Student interviews
  - *a) feedback they received from IStation when they made progress,*
  - *b) feedback they received from IStation when they made errors;*
  - *c) reasons for liking IStation;*
  - *d) reasons for disliking IStation.*

Results

Monthly Average STAR Scores from Sept to Jan

	N	Mean	SD		P value
SEPSTAR	98	346.58	117.590		
OCTSTAR	98	328.46	126.686	Sep vs. Oct	p < 0.0005
NOVSTAR	98	372.22	122.434	Oct vs. Nov.	p < 0.0005
JANSTAR	98	401.01	122.710	Nov. vs Jan	p < 0.0005

Correlation between IStation scores and STAR Reading Test scores

	Pearson's r	*p* value
October	r = .470	p < .001
November	r = .710	p < .001
January	r = .578	p < .001

Student perceptions towards IStation as a tool to support reading comprehension

Pros:

- A more enjoyable student experience included the highlighting feature

- the program will highlight words as it reads them aloud

- It was adaptive enough to detect students' mistakes and give them hints to guide them to the correct solution.

- Received a large amount of praise and compliments if they performed well on the program; receiving encouraging feedback if they did poorly on IStation

Cons:

- Tier 1 student: not challenging their abilities
- Tier 2 & 3 student: overwhelmed with the amount of practice that was demanded of them on IStation.

Student Quotes

- "I liked the colors and the way the characters moved around and made me laugh. It helped me a lot when I read with it [as if] I had a buddy on the computer to make reading fun again."

- "It was always ready to give me help when I needed it."

- Tier 1 student- "It was kind of babyish because the characters talked to me like I was dumb."

- Tier 2 student- retaught too much information and gave too many hints when the student wanted to answer the question independently.

- Tier 2 & 3 student- "I was always busy doing more and more lessons. It never ended!"

Instructor Perceptions towards IStation as a tool to support reading comprehension

Statements	Pre-test	Post-test
1. All students will succeed in improving their reading levels after using IStation.	5	4.67
2. Students' reading comprehension levels will increase dramatically after using IStation	4	3
3. Students will perform better on the STAR reading assessment after using IStation.	5	4
4. Students need IStation in order to improve their Lexile reading levels.	4.67	4.3
5. It will require a lot of teacher work to get the students interested in working on IStation program.	2	2
6. Students will love continuing to use IStation.	4.3	3.6
7. The administration's mandate for students to use IStation is the main reason my students will use the program.	2	3.3

1= strongly disagree; 2 = disagree; 3 = neutral; 4 = agree; 5 =strongly agree

Teacher Interviews

- "Most of my students enjoy the layout and game-like graphics."

- "I don't think they need any incentives. They are always eager to go online."

- "I really don't know many features because there was very little training."

- "There was a disconnection between what the students are learning in their online lessons and the feedback the teacher received from IStation."

- "Some [students] complained that it talked to them like they were a baby. These were lower level students. So, I'm assuming the character changed its voice (perhaps the speed it spoke?) depending on the level of the child."

Discussions

- IStation program my have helped students improve their reading skills during its implementation.

- Extraneous factors such as individual teacher lesson plans for whole and small group reading existed during its implementation.

- Students' engagement in daily reading activities within the classroom as well as at home could have also contributed to this STAR test score increase.

- There is a variability in terms of how conducive IStation was to students with varying levels of reading ability (Tier 1, 2, and 3 students)

Recommendations to Future Researchers and Practitioners

- There is no one-size-fits-all solution when implementing such technology to a diverse array of learners on different reading levels.

- Providing professional development and training opportunities to assist teachers with the familiarization of the program's use is essential

- It is critical to leverage the higher achieving students with using IStation to help them to be involved in self-regulatory learning