

iPadagogy

An Examination of Teaching
Practices in a 1:1 iPad Initiative

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Purpose of the study?

- 1. Describe the pedagogical practices of teachers in a one-to-one iPad initiative**
- 2. Provide valuable input to draw further guidelines for continuing, improving or expanding iPad mobile learning initiatives.**

Background

- **Saint Edmond's Academy**
 - All-boys, Catholic, independent
 - 2011: Began 1:1 iPad Initiative (Grades 6-8)
 - Approx. 90-130 students



Device Training

Teachers

- Apple training
- Year 1: Meetings w/UD professors
 - What apps carry out classroom tasks?
 - Developing initiative-wide app list
- Years 2-3: Teacher-led meetings
 - Pedagogical ways to integrate iPads in classrooms
 - Lesson/unit demos
- Years 3-5: iPad Institute

Students

- iPad orientation
 - Device setup, AUP & Parental Controls
- Student training
 - DropBox, Edmodo, Notability & iHW
- Weekly tutorials during school assembly
- Classroom embedded trainings

Guiding Questions

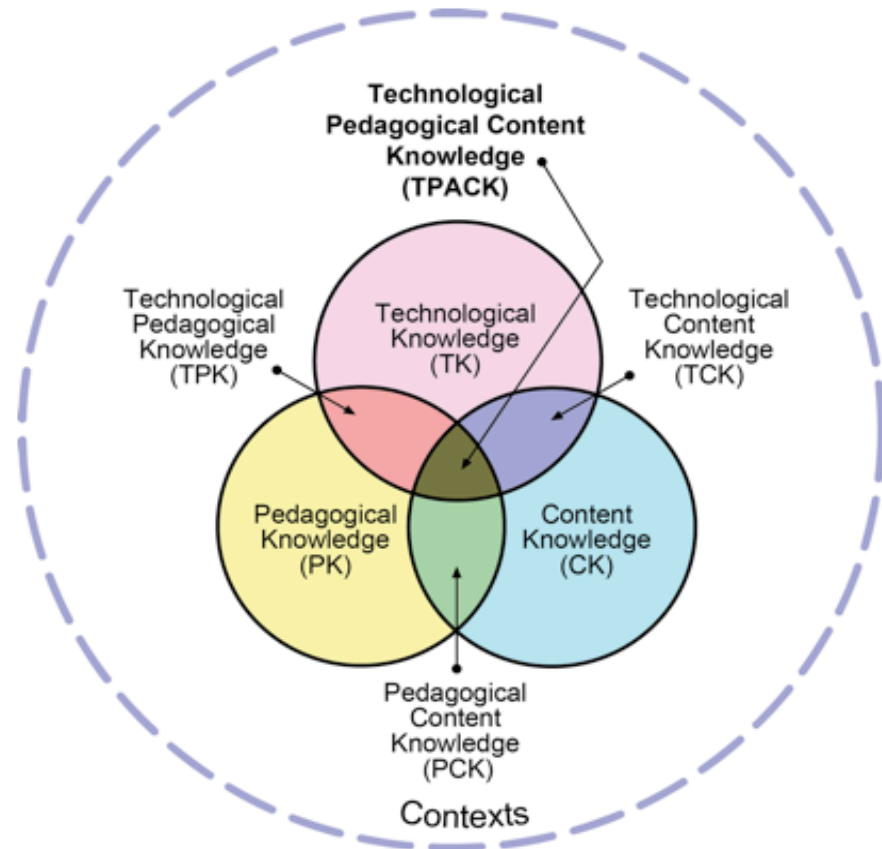
- 1. To what degree** are iPads integrated into the teaching and learning processes at Saint Edmond's Academy?
- 2. How** did teachers integrate apps into their instruction, given long-term and unlimited access to iPads?
- 3. What are teachers' beliefs** with regard to the benefits and drawbacks of using mobile technology in the classroom?

Measuring “integration”

- **Integration: teachers and students using the iPad in meaningful ways throughout instruction**
- **Technological Pedagogical Content Knowledge (Mishra & Koehler, 2006)**

TPACK Diagram

- Interplay of the three basic components of knowledge
 - Content
 - Pedagogy
 - Technology



(Baran, Chuang & Thompson, 2011)

What the literature says

- **Mobile learning: use of mobile or wireless devices for the purpose of learning.** (Park, 2011)
- **Features can:**
 - Shift teacher pedagogy
 - Provide flexibility & choice
 - Personalize instruction
 - Engage *all* learners
 - Improve student outcomes

(Mouza & Cavalier, 2012)

Shifting Pedagogy

- **Student-centered instruction, constructivist**

(Brophy, 1999)

- **Dependent on students** (Davis, 2010)
- **Partnering with students in the learning process**
(Prensky, 2010)
- **“Flipping” the role of homework** (Bergmann and Sams, 2012;
Hamdan, McKnight and Arfstrom, 2013; Bledsoe and Pilgrim, 2015)

Flexibility & Choice

iPads allow

- S's build knowledge multimodally, individually and/or collaboratively (Mentor, 2015)
- Learning in physical or virtual space (Park, 2011; Melhuis and Falloon, 2010; Jones, Scanlon and Clough, 2012)
- When and where (and in what ways) students want to learn (Traxler, 2007)

iPads allow

(Liu et. al, 2014):

- Learning in real-world settings
- Customization of lessons to fit individual
- Multiple learning pathways
- Multimodality
- Learning creation

Flexibility => students becoming active learners

Personalized & Differentiated

- Demand for DI (Johnson et. al, 2013)
- iPads to personalize (Berson et. al, 2015)
- iPads provide highly personalized platform by (Looi et. al, 2014)
 - Flexibility
 - Customization
 - Active participaiton
 - Co-creation
- iPad specific features (Learning Exchange, 2011)
 - Video & voice: create personalized lessons
- iPads enable (McClanahan, Williams, Kennedy and Tate, 2012)
 - Multimodality
 - Chunking tasks
 - Immediate feedback to teachers & students

Engaging All Learners

Affordances

- iPads offer (Learning Exchange, 2011)
 - Instant access, Engaging learning experiences, Reinforcement of concepts & support 21st century skill development
- Cameras (Ekanayake and Wishart, 2015)
 - Active participation
 - Increase T/S interaction
 - Collaboration

Special Needs

- Support students with special needs (Fernandez-Lopez, Rodriguez-Fortiz, Rodriguez-Almendros & Martinez-Segura, 2012)
- Autism: Teaching verbal bx skills (Sabale, 2013)
- Literacy development through interactivity (Estevez-Menendez, An and Strasser, 2015),
- Effective for students with ADHD (Hong, Lawrence, Mongillo and Donnantuono , 2015)

Improving Student Outcomes

- **Review of K-12 mLearning literature (2007-14) showed positive learning gains** (Liu et. al, 2014)
- **Greater gains in CK, problem solving and language** (Kumi-Yeboah and Campbell, 2015)
- **Deeper understanding of content** (Millman, Carlson-Bancroft and Vandan, 2015)

So, where's the gap?



- Not much research about instructional implications and challenges of using tablets in educ. (Kumi-Yeboah and Campbell, 2015)
- 86% of MS students believe tablets *can* improve learning, 75% would like to use them more often (Harris Interactive, 2013)

Problem Statement

Examine the ways in which teachers utilized iPads in conjunction with content and pedagogy to support flexibility and student choice, personalized and differentiated instruction, and improved student outcomes.

Participants

Pseudonym	Subject Area(s)	Grade Level(s)	Teaching Experience
Mr. Shaw	Science, Math	4-6	8
Mr. Clyne	Religion	4-6, 8	8
Mrs. Carrick	Spanish	4-6	14
Mrs. Persie	Science	7	27
Mr. Herrera	Spanish	7-8	5
Mr. McNair	Music	2-4, 6-8	6
Mr. Daley	English	7-8	5
Mr. Mata	Science, Math	6-8	16
Mr. Rooney	Math	6-8	30

Data Collection

Jan.-Mar. 2015 (2 rounds)

1. Lesson Plan
2. Classroom Observation
3. Follow-up interview



Lesson Plans

Collection

TPACK Lesson Plan Template

- Available tech:
 - Projector
 - iPads for T and S
 - Laptop
 - Software, web apps and iOS apps provided by the school

Analysis

Technology Integration

Assessment Rubric (Harris et. al, 2010)

- Curriculum goals & tech
- Instructional strategies & tech
- Tech. selection
- “Fit” (tech, pedagogy & content)

Classroom Observations

Collection

Technology Integration

Observation Instrument (Harris, Grandgenett & Hofer, 2010)

- 60 min (1 class period) each
- Teacher scheduled observations based on class schedule
- How iPads integrated with content and pedagogy

Analysis

Technology Integration

Observation Instrument (Harris et. al, 2010)

- Curriculum goals & tech
- Instructional strategies & tech
- Tech. selection
- “Fit” (tech, pedagogy & content)
- *Instructional use*
- *Technology Logistics*

Teacher Interviews

Collection

- TPACK Interview Protocol (Harris, Grandgenett & Hofer, 2010)
- Teacher scheduled interviews based on availability
 - Discuss beliefs and experiences related to how iPad integrated in observed lesson
 - Goals of lesson
 - Parts of lesson (T-centered, S-centered)
 - Pedagogical & technological choices
 - Overall reflection on lesson

Analysis

- Initial code list developed
 - Codes in lit. review
 - Codes emerging from interviews
- Initial codes=>Parent Codes
 - Flexibility & Choice
 - 21st Century Pedagogy
 - Improving Student Outcomes
 - Engaging All Learners
 - Personalization & DI

Code	Number of Instances
Flexibility and choice	10
Empowers students	10
21 st Century skills	10
Ease and efficiency	9
Engages students	9
Embedded feedback	8
Tech. understanding	8
Flipped learning	7
Access to information	6
Multimodality	6
Organizational Tool	5
Efficiency	4
Peer/Informal PD	4

Findings

Key Question 1:

To what degree did teachers integrate iPads with specific content and pedagogical strategies to support teaching and learning processes at Saint Edmond's Academy?

Degree of Integration with content & pedagogy

Findings

- Moderately high (M=3.00, SD=0.61) degree of planned iPad integration
- Moderately high (M=2.89, SD=0.61) degree of observed iPad integration

Implications

- Teachers understand how to plan for lessons that integrate tech., pedagogy & content
- Teachers understand how to integrate tech., pedagogy & content using iPads

Mrs. Persie's "Leap of faith"

Low Integration (Lesson 1)

- Teacher "delivers" instruction through presentation of content
- Students use iPads to take notes
- Students given copy of presentation slides
- Students record lab demo for playback when doing lab

High Integration (Lesson 2)

- Collaborative learning groups
- Students use iPads to
 - Create concept map
 - Make a teaching lesson on topic
 - Create 4 "quiz" questions
- 8 different tools/apps used during lesson to create authentic products of student learning
- iPad became the mode with which students demonstrated understanding
- 4 C's of 21st Century learning

Findings

Key Question 2:

How did teachers integrate apps into their instruction, given long-term and unlimited access to one-to-one iPads?

Integrating iPads

- 18 different apps across the 9 teachers (Avg. 6 apps per teacher)
- 16 apps were multifunctional across content area
- Key themes describing teacher integration:
 - Integrating Apps, content and pedagogy
 - Developing 21st Century Skills
 - Using Apps to support student flexibility and choice

Integrating iPads



App	Mr. Shaw	Mr. Clyne	Mrs. Carrick	Mrs. Persie	Mr. Herrera	Mr. McNair	Mr. Mata	Mr. Daley	Mr. Rooney	Total
Notability	X	X	X	X	X			X	X	7
Pages				X			X	X		3
Keynote	X	X		X						3
DropBox	X	X	X		X	X		X		6
Popplet	X	X		X						3
Edmodo	X	X				X		X		4
iMovie	X		X	X	X					4
Safari	X			X	X		X			4
iBooks		X		X					X	3
QR Code	X								X	2
Kahoot	X							X		2
YouTube		X		X	X					3
Camera Roll			X	X	X					3
Minecraft	X									1
Terraria	X									1
Educreations	X			X						2
Garageband					X	X				2
Quizlet				X						1
Total	12	7	4	11	7	3	2	5	3	



Integrating iPads

- Most frequent apps:
Notability, DropBox, iMovie
- Infrequent apps were task-specific
 - Minecraft-Designing virtual recreations of volcanoes



Developing 21st Century Skills

Low Integration

- Use iPad to fill in graphic organizer

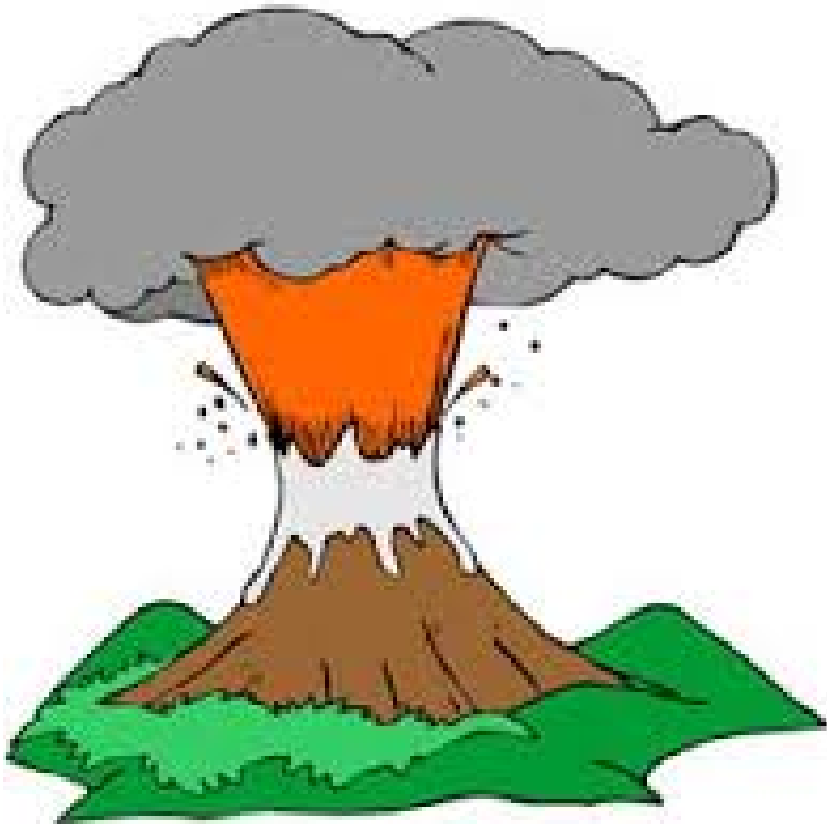
High Integration

- Use iPads to create a representation of student learning (music video of verb tense)

Focus on learning goals rather than tech. integration led to higher TPACK scores

Student Flexibility and Choice

- iPad becomes tool for students to complete learning goals and show understanding of content
- Mr. Shaw's restless earth



Findings

Key Question 3:

What are teachers' beliefs with regard to the benefits and drawbacks of using mobile technology in the classroom?

Reported affordances

Code	# of Teachers
Flexibility and choice in how learning demonstrated	7
Access to information	6
Teacher as learning coach	5
Organization tool	5
Easy to operate	5
Immediate feedback	5
Multimodality	4
Collaboration	4
Student Creativity	4
Efficiency	4
Video use	4
Embedded features	3
Flexible space	3
Student centered pedagogy	3
Appeal to all students	3
Flipped Learning	3
Critical Thinking	2
Put students in charge	2
Game-based learning	2
Engages students	2

Teachers' beliefs

Mr. Shaw:

“The knowledge that came through in their projects was strong and it allowed them to be more motivated when working.”

Mr. Mata:

“[iBook videos] reinforce the concepts presented in class.”

Mrs. Persie:

iBook: “Convenient because of its portability”

“[instant internet access] guides student and provides information for their research.”

Reported challenges

Code	# of Teachers
Need to learn how to operate	4
Sought out informal/peer PD	4
Must set parameters of use	3
Distractibility	3
Materials lacking	2
Review tech use	2
Tech troubles	2
Need to model	2
Doesn't fit all content/lessons	2

Main challenges

Teachers

- Need to learn how to operate iPad before integrating into instruction
- Seeking out PD that addresses specific teacher needs (learning Garageband through YouTube)

Students (teacher-reported)

- Distractibility
- Need to set parameters for use

Affordances outweigh challenges when integrating iPads with content and pedagogy

Limitations of the study

- 1. Number of teachers**
- 2. Short time frame for data collection**

Recommendations

- **Admin:**
 - Provide Peer PD within and between schools
 - Celebrate teacher successes through EdTech training institute
 - Workshops
 - Repository of lessons
- **SEA Teachers:**
 - Develop uniform authentic assessments
 - Rethink homework
- **Schools new to 1:1 tech.**
 - Change the conversation
 - Choose devices to fit purpose and audience
 - Constant Communication