Behind Teachers' Adoption of 1:1 iPad Implementation in The Classroom: The Role of Efficacy and Perceived Impact

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Abstract

While the positive impact of 1:1 iPad implementation on teaching and learning has been acknowledged in the past few years, research about the factors contributing to successful implementation has not yet been explored as widely. This study aims to examine teachers' efficacy to use iPad as teaching tools as well as their perceived impact of 1:1 iPad implementation in the classroom and both role in predicting teachers' adoption of the technology. The 1:1 iPad implementation being studied in this research is initiated by an education-technology consultant in Indonesia, Websis for Edu (WFE), through a program called Smart Classroom. A total of 91 participating teachers (44 male and 47 female) are from upper middle class private schools who have been implementing the program for three months. The implementation started from late 2017 following teachers' professional development aimed to equip them with minimum skills required for implementation. All three variables being studied are measured using instruments developed by the researcher and self-rated by participating teachers: iPad for Teaching Efficacy, Perceived Impact of iPad in The Classroom, and iPad Implementation Consistency. All three instruments have good internal reliability and validity, with alpha coefficient of .97, .92, and .93 respectively. Multiple linear regression analysis revealed that teachers' efficacy significantly predicts their consistency in iPad implementation, but teachers' perceived impact of the implementation does not. This finding plays an important role in the modification of the iPad adoption program design.

Introduction

Today's Education

The way students learn

Skills taught in school

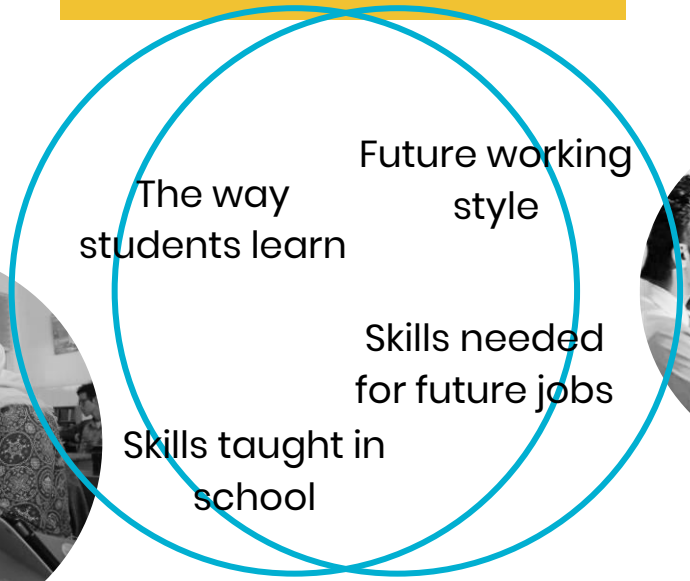
Tomorrow's Challenges

Future working style

Skills needed for future jobs

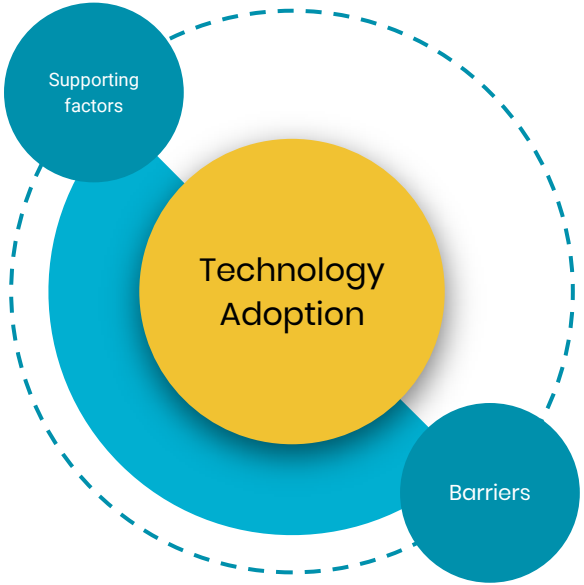
Today's education has not adapted adequately with future demands.

Technology Integration



Technology integration has been recently initiated in order to close the gap, but it is a complex process.

- For successful technology integration, we need to understand factors affecting its acceptance.
- 2 types of barrier in technology integration:
  - First-order barriers: Environment factors (e.g. infrastructure and internet access)
  - Second-order barriers: Intrinsic factors of the people (e.g. efficacy, beliefs, and attitude about technology).
- First-order barriers are easier to overcome but second-order barriers play a key role in behavior change.

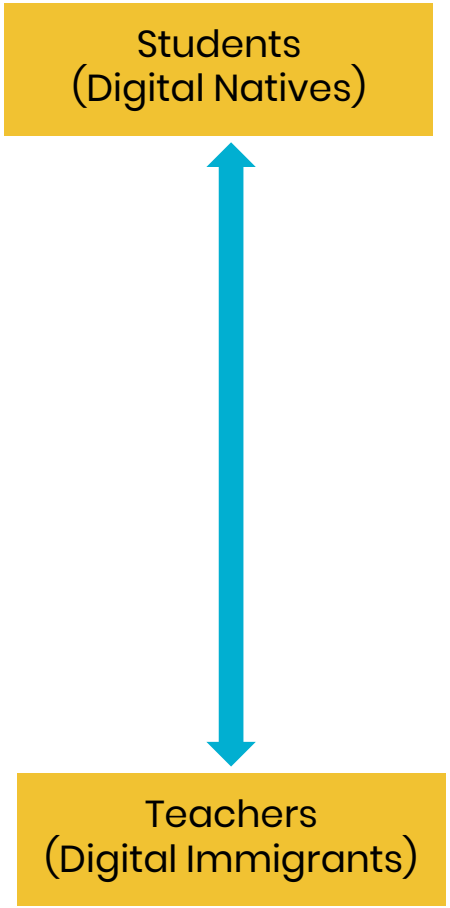


- Unique challenges in technology integration in the classroom: Generation gap between teachers and students
  - Teachers tend to perceive students more technology savvy, but they need to be at least at the same level to conduct a technology-integrated lessons.
  - Teachers tend to perceive technology as distractions rather than learning tools.

Meanwhile...

- 2 fundamental determinants of behavior:
  - How well one feels capable to do it
  - How valuable the outcome of the behavior

(Bandura, 1982; Davis, 1989)



Purpose of This Study

This study aims to explain intrinsic factors of the teachers that influence the outcome of technology adoption in schools.

We examined **teachers' efficacy in using iPad** as teaching tools and their **perceived impact of iPad use** in the classroom, as well as how both variables contribute to their **consistency of implementation**.

Theory and Hypothesis

Efficacy

- Bandura (1982, p.122): judgment of how well one can execute courses of action required to deal with a prospective situation
- **In this research: iPad-teaching efficacy**
  Teachers' judgment of how well they can use iPad in teaching and learning process in the classroom.
- Efficacy is one of proximal determinants of behavior: If one believes that he/she could do something, he/she is more likely to do it (Davis, 1989).

Hypothesis 1: Teachers' iPad-teaching efficacy will significantly predict teachers' consistency in using iPad as their teaching tools.

Perceived Impact

- Similar to these concepts:
  - Bandura's outcome judgment
    The extent to which a behavior, once successfully executed, is believed to be linked to valued outcomes. (Davis, 1989, p.3)
  - Davis (1989, p. 2): Perceived usefulness
    The degree to which a person believes that using a particular system would enhance his or her job performance.
- **In this research: Perceived impact of iPad use in the classroom Teachers' judgment about how iPad use in the classroom affect various aspects of teaching and learning process.**

Hypothesis 2: Teachers' perceived impact of iPad use in the classroom will significantly predict teachers' consistency in using iPad as their teaching tools.

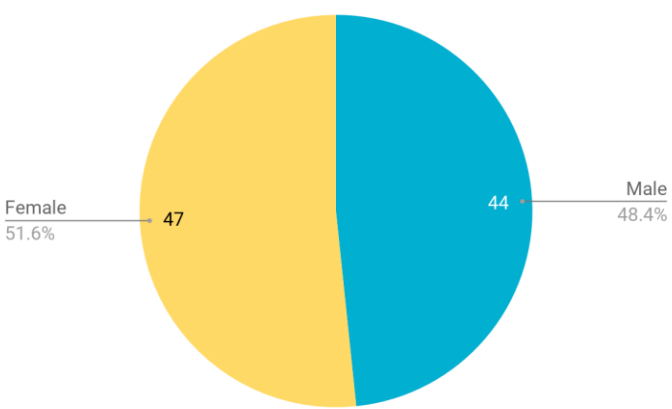
Technology (iPad) Adoption

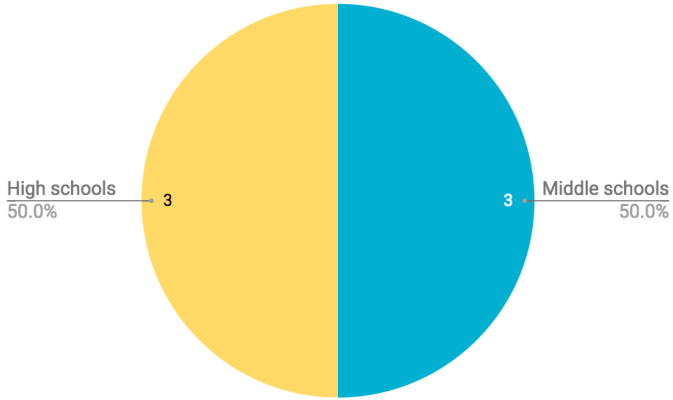
- Measured by **teachers' consistency of iPad use in teaching and learning process in the classroom**
- Considered an important prerequisite for the positive impact to take place
- Teachers' practices and students' learning would improve only when technology is used regularly in the classroom (Kim et al., 2013)

Method

Participants

91 teachers from 6 schools





- All schools are upper middle class private schools
- All teachers have:
  - at least three months implementation experience in Smart Classroom program
  - completed two-months long training about iPad for teaching

Measurement: Efficacy

- Instrument is developed by the researcher
- Named **iPad for Teaching Efficacy (iTE)**
- 19 items consisting of six basic teaching skills for iPad integration
  - Digital note-taking
  - Online document management
  - Online collaboration
  - Online assessment
  - Smart Classroom management
  - Lesson plan design.
- Cronbach's alpha: .97
- All items correlated significantly with total score

Measurement: Perceived Impact

- Instrument is developed by the researcher
- Named **Perceived Impact of iPad in The Classroom (PIIC)**
- 16 items
  - 7 items question impact for teachers
  - 9 items question impact for students
- Cronbach's alpha: .92
- All items correlated significantly with total score

Measurement: Adoption

- Measured by consistency of iPad use in the classroom
- Instrument is developed by the researcher
- Named **iPad Implementation Consistency (iIC)**
- 19 same items with iTE (efficacy measure)
- Cronbach's alpha: .93
- All items correlated significantly with total score

Sample Items	Likert Scale
Efficacy How do you rate your ability to: 1. Conduct an online assessment 2. Share online teaching materials with students	1 = not able 2 = somewhat not able 3 = somewhat able 4 = very able
Perceived Impact How does Smart Classroom implementation influence: 1. Teachers' administrative workload 2. Teachers' variety of learning materials 3. Students' interaction with teachers 4. Student's collaboration with each other	1 = decrease a lot 2 = somewhat decrease 3 = does not change 4 = somewhat increase 5 = increase a lot
Consistency of iPad Use In the past three months, how often do you: 1. Conduct an online assessment 2. Share online teaching materials with students	1 = never 2 = rarely 3 = often 4 = always

Sample Items

Results

Descriptive Statistics

In average…

- Teachers are **quite confident** in their ability to use iPad for teaching (M=3.07; SD=.60)

- Teachers find iPad use in the classroom **slightly increasing various aspects of learning and teaching** process (M=3.41; SD=.70)

- Teachers' are **fairly consistent** to use iPad in their classrooms (M=2.80; SD=.53)

Regression Analysis

- Teachers' efficacy in iPad use significantly predicts consistency (β = .625, $p<.01$), but perceived impact does not (β = .107, $p>.01$).

- Both teachers' efficacy and perceived impact together resulted in R-square of .442, which means that 44.2% variance proportion in teachers' consistency can be explained by their efficacy and perceived impact of iPad use

Discussion and Conclusion

Summary of Findings

- Core interest: internal factors contributing to teachers' adoption of 1:1 iPad implementation in the classroom
- Variables examined: teachers' efficacy and their perceived impact of iPad use for teaching
- Findings:
  - Teachers' efficacy in iPad use for teaching significantly predicts their implementation consistency
  - Teachers' perceived impact of iPad implementation does not significantly predict their implementation consistency
  - Both factors explain about 40% proportion of variance in teachers' implementation consistency

Limitations and Suggestions

Limitations	Suggestions for Future Research
Efficacy and consistency instruments are limited to the six basic skills taught in teachers' training → some other possible scenarios of implementation might not be covered	Revise the instruments: • Shorter form (high internal reliability might indicate redundancy) • More general sample of behavior
There appears to be other factors that explain why perceived impact does not predict consistency, possibly school environment factors (e.g. law enforcement, leadership style)	• Take into account other variables (school environment factors and other internal factors such as teachers' beliefs about teaching and learning, change readiness, etc) • Collect data in multiple points following the process → capture the change and dynamics

Implications

This research findings play an important role in the modification of iPad adoption program design.

- The program needs to ensure that teachers feel capable to use the iPad for teaching
  - The initial training for teachers should focus on the basic skills that teachers can master easily
- Campaign about the program should focus on creating perception of ease rather than usefulness.

Since the finding is not fully consistent with relatively established Technology Acceptance Model (TAM), further research is needed.

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