

eLearning Forum Asia 2015



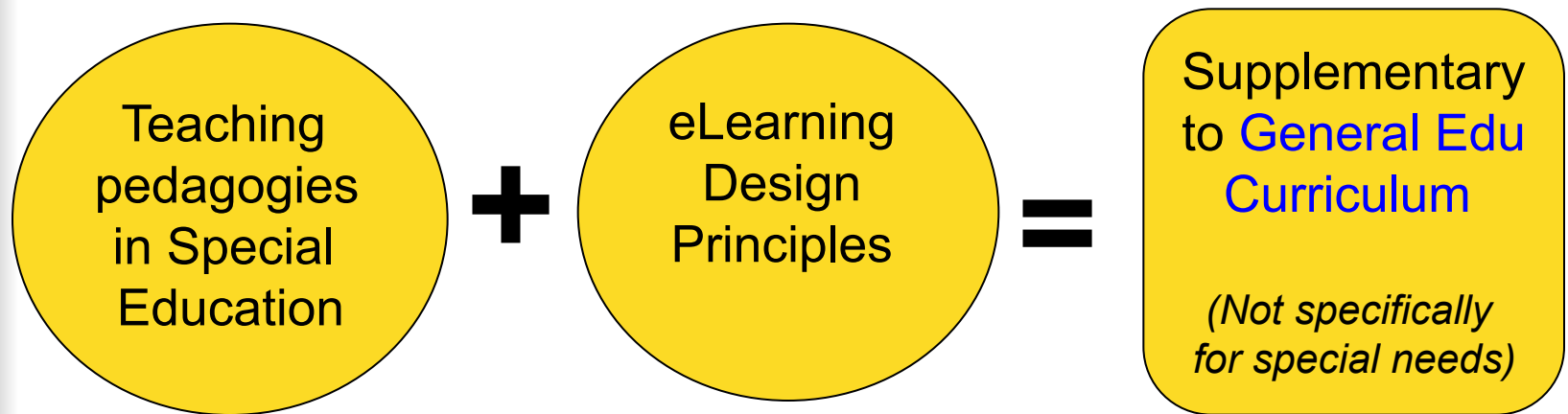
A learner-centered math online tutorial for learners with diverse learning needs

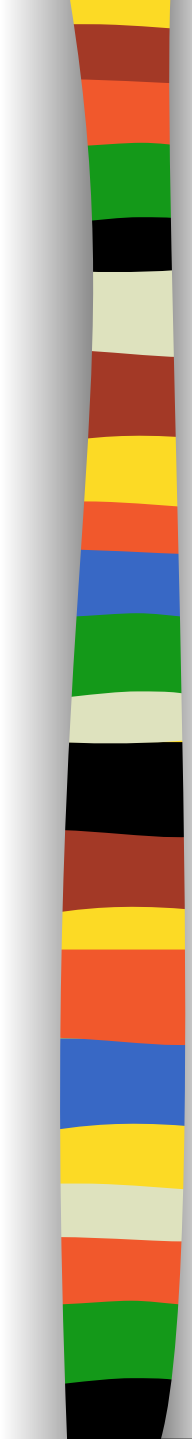
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Background

- BAIP (*Blending Assessment with Standards Based Instruction Program*) teaching Math was developed in the University of Kansas (Meyen, Greer & Poggio, 2008).



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- In the U.S. - Large-scale field-testing involving 187 school districts in 2008 and 239 in 2009 with typical students and students with special needs in mainstream schools.
 - ➔ Animated tutorials.



Significance: Local Context

- ICT was integrated into the curriculum framework in 2001: "To link concrete experiences to abstract ideas (**Concepts and Skills**), to enjoy mathematics lessons (**Attitudes**), to become independent learners (**Metacognition**), and to explore different ways of solving problems using higher level of competencies (**Processes**) (Wong & Lee, 2009).
- Field testing in Singapore.



Research Questions

As a part of a larger field testing study, this study aims to investigate:

- (1) What's the feedback from students and teachers on the benefits of BAIP animated tutorials (in promoting **concepts and skills**, **attitudes**, **metacognition**, and **problem solving processes**)?
- (2) Do teachers consider BAIP beneficial for students who are **typical** and with **special needs**?



Methods

■ **Participants and settings:**

(1) 46 students in P3-P4 in an international school.

(2) 82 teachers from mainstream schools and those who work with low achievers and special needs students in all settings.

■ **Data collection procedures:**

(1) Students completed BAIP math animated tutorials in one semester and responded to a survey (3 point rating scale).

(2) Teachers reviewed BAIP animated tutorials and responded to a survey (5 point scale).

■ **Data analysis:** Percentage. Mean rating. Rankings.

Results

■ 1. Students' feedback on BAIP:

Students' feedback using BAIP tutorials (N=46)

Domain	Survey Item	Mean Rating	Domain mean
1. Concepts and skills	Animation helps me learn better and "see" what math means	2.72	2.71
	Tutorials help me see how math is connected to real life	2.65	
	I learn something new from tutorials (#4)	2.74	
	A good way to recap and review topics even if I already know the topics	2.73	
	The tutorials repeated important concepts; it helps me learn better	2.71	
2. Attitudes	I enjoy doing the animated tutorials (#1)	2.83	2.78 (Highest)
	I like doing the activities in the animated tutorials more than worksheets (#3)	2.80	
	I would like to learn more math concepts using similar tutorials	2.69	
	I think the tutorials will help other children who do not like math to learn math better	2.73	
	If I can learn other subjects (e.g., science) through animated tutorials I think I will enjoy learning more and do better (#1)	2.83	
3. Metacognition	The speaker (sound) in the tutorials is helpful for me to follow and understand the topics (Lowest)	2.52	2.61
	I like that the tutorials tell me if my answer is right or wrong right away	2.69	
4. Problem solving/ processes	I like that the tutorials tell me if my answer is right or wrong right away	2.69	2.68
	The tutorials encourage me to think more before I decide my answer	2.67	

■ 2. Teachers' feedback on BAIP

Teachers' feedback on reviewing BAIP tutorials (N=82)

Domain	Survey Item	Mean Rating	Domain mean
1. Concepts and skills	The BAIP animated tutorials are clear in explaining the concepts	3.89	3.88
	The tutorials used visual cues which foster success for students' learning	3.85	
	Repetition (to reinforce the concept) has been used effectively in the tutorials (#3)	3.90	
2. Attitudes	I believe the students' confidence will increase using the tutorials	3.46	3.67 (Lowest)
	From my perspectives the animated tutorials are able to engage and motivate students	3.59	
	I think students will enjoy doing the animated tutorials more than doing typical math direct instruction and curriculum in schools	3.89	
3. Metacognition	Immediate and positive reinforcement to students' performance	3.72	3.89
	The break down of the content (into smaller chunks and steps) enables students to absorb and retain knowledge better (#1)	4.06	
4. Problem solving/ processes	The tutorials encourage higher order thinking by asking critical thinking questions and relating the concepts to real life.	3.70	3.71
	Immediate and positive reinforcement to students' performance	3.72	
5. Diverse Learners	The tutorials used visual cues which foster success for students' learning	3.85	3.93 (Highest)
	The break down of the content (into smaller chunks and steps) enables students to absorb and retain knowledge better (#1)	4.06	
	Repetition (to reinforce the concept) has been used effectively in the tutorials (#3)	3.90	
	The self-pacing feature of the tutorials is ideal for students with learning difficulties, special needs, and slow learners.	3.83	
	I think the tutorials can benefit typical students (without special needs) in mainstream schools too (#2)	4.02	



Discussion and Conclusion

- Consistent with previous literature.

1. The use of ICT alone would not ensure better teaching and learning. ICT has to be used in conjunction with **effective pedagogy** (Leong and Lim-Teo, 2003).
2. ICT integration provides adaptable learning environments, procedures, and materials that can fulfill the needs of both students **with** and **without special needs** (Rose, Hitchcock, & Meyer, 2005).
3. ICT and computer based instruction promotes student **engagement** and **motivation** (Lock & Carlson, 2000; Mathews, Pracek, & Olson, 2000).

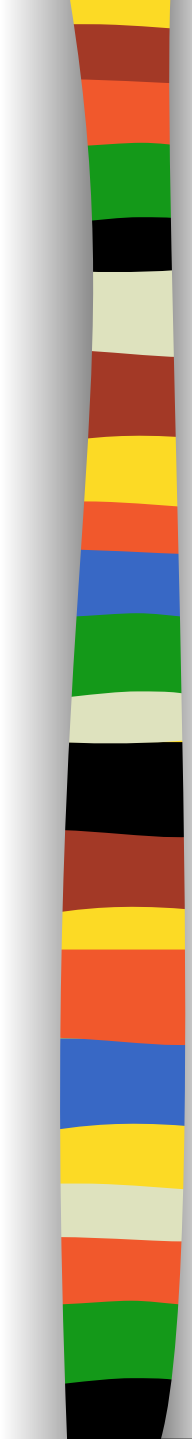


- Specific findings:

1. Students' feedback: The domain of **motivation** obtained the highest rating.

Teachers' feedback: The **diverse learner** domain obtained the highest ranking; **motivation** lowest.

2. Teachers agreed that BAIP tutorials can benefit **typical** students as well as low achievers, special needs students.

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- Although students did well in the tutorial quizzes and 67.4% consider the tutorials easy (*15.2% neutral*), 80.5% of the students agreed that they **learn something new** from the animation tutorials (*13% neutral*).

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Limitations

Q & A