



# Evaluation of WeBWork and the Mathematics Support Center (MSC)

Center for Enhanced Learning and Teaching (CELT)

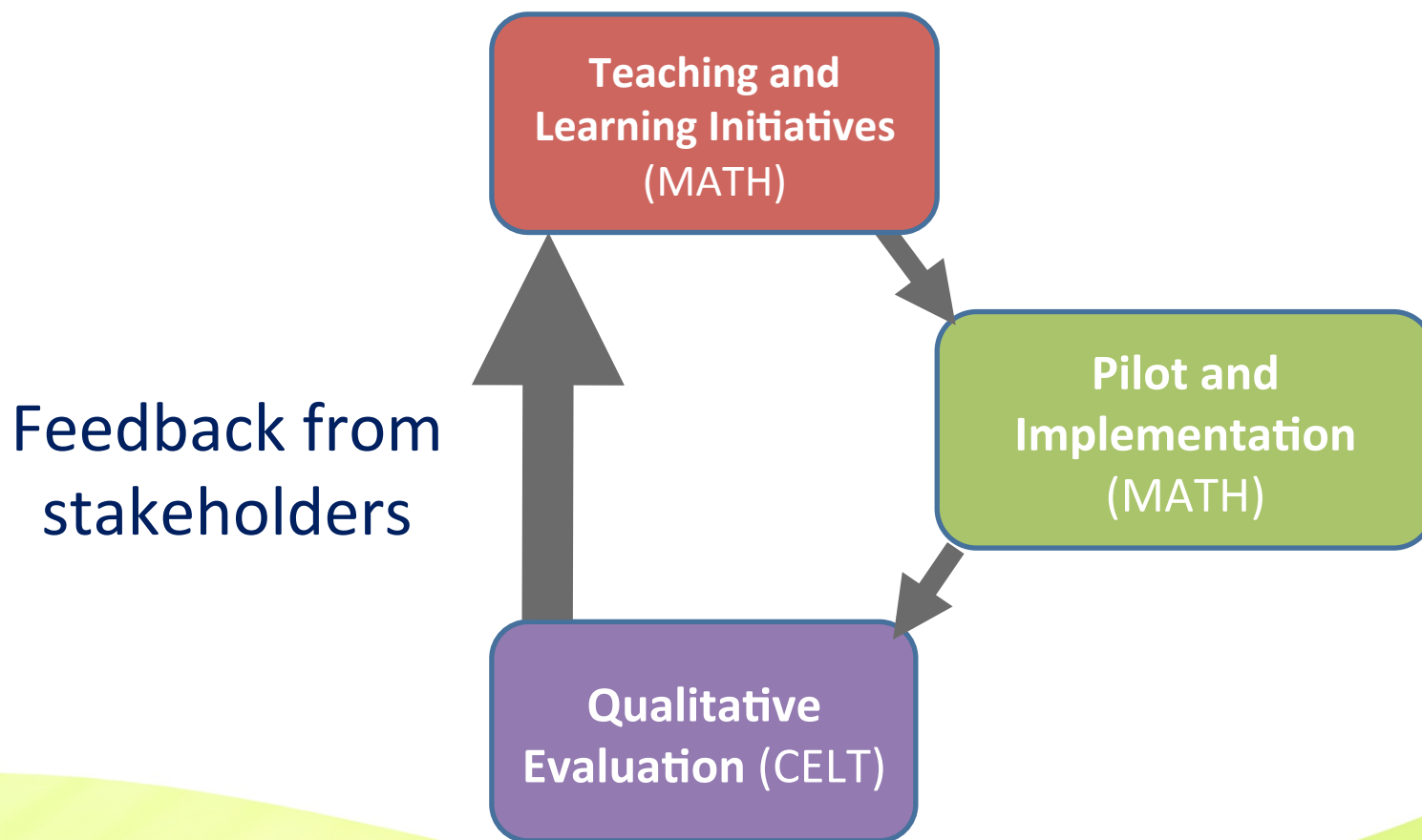
11 June 2014



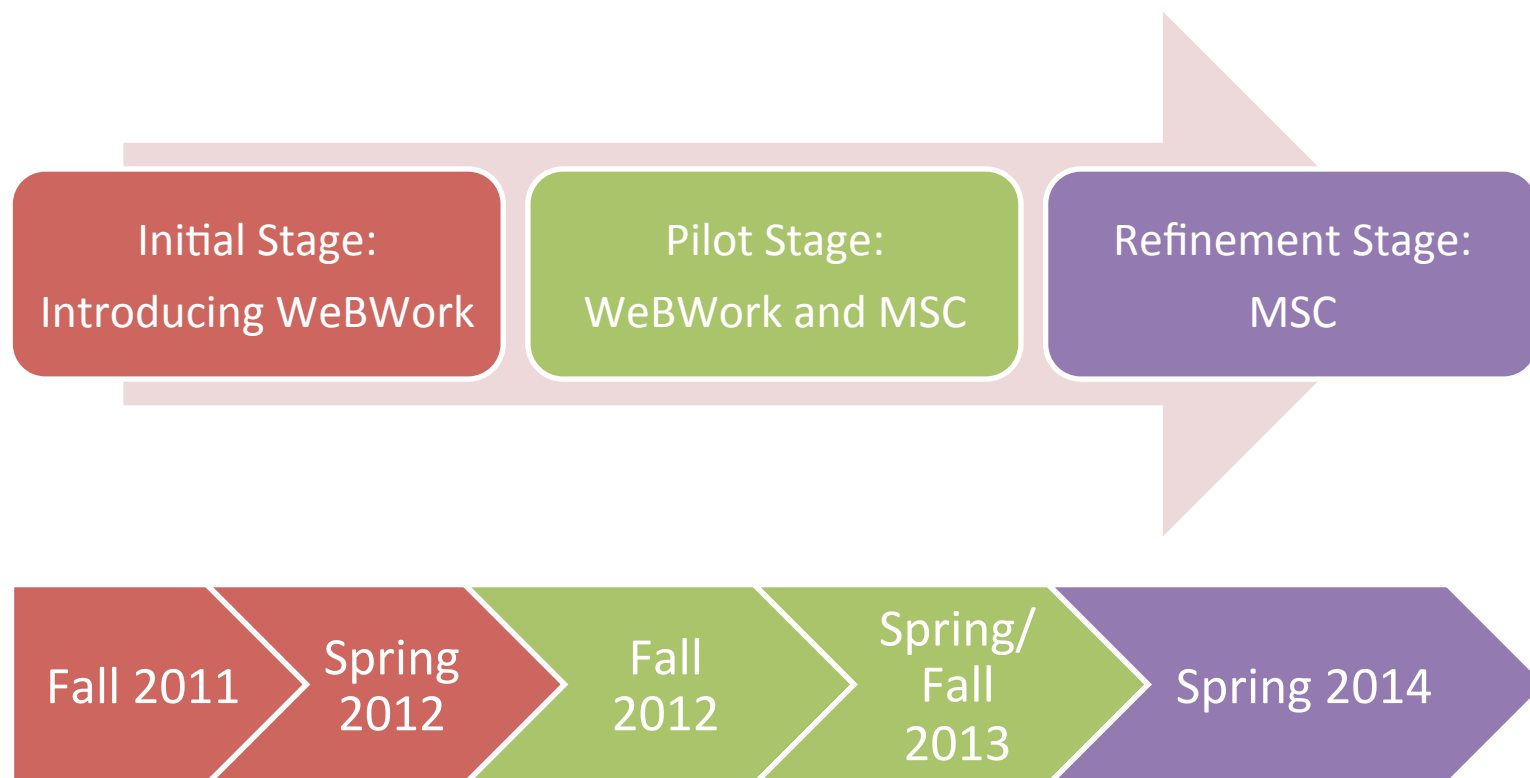
# Roles of CELT

- We support faculty/dept/school/institution to realize teaching and learning ideas that can enhance student's learning experience at HKUST

# Evaluation Cycle



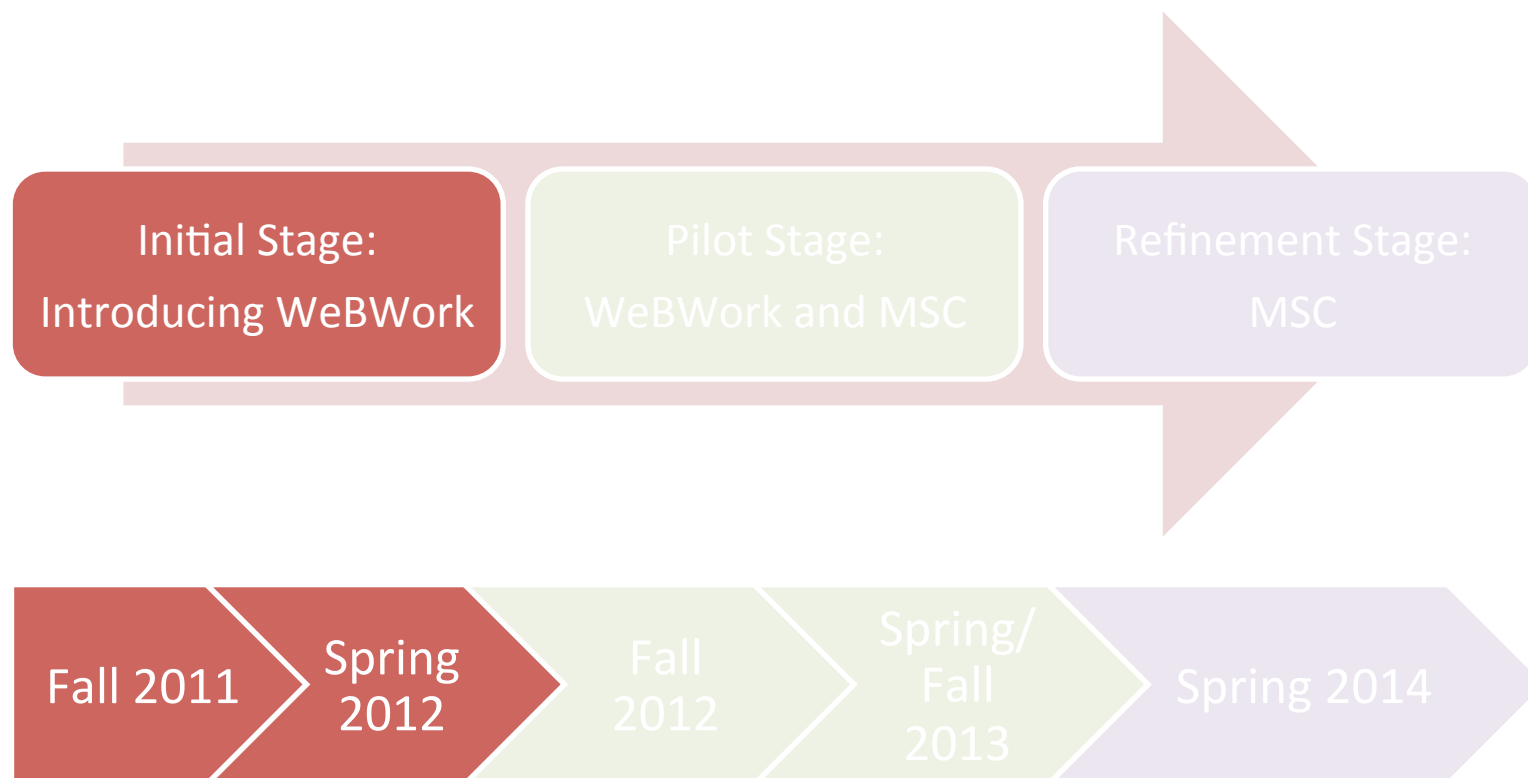
# Evaluation Timeline



Stage	Time	Response Rate	Focus
Initial (QS)	Fall 2011	43% (200/464) Mid 33% (155/464) End	<ul style="list-style-type: none"> <li>Usefulness, user-friendliness, and impact on student learning of WeBWork</li> </ul>
	Spring 2012	17% (65/383)	<ul style="list-style-type: none"> <li>Usage of the MSC</li> <li>Impact on student learning</li> </ul>
Pilot (QS)	Fall 2012	33% (1448/4368)	<ul style="list-style-type: none"> <li>Usefulness, user-friendliness, and impact on student learning of WeBWork (Fall 2012 only)</li> <li>Students' usage on the MSC and their satisfaction on the support provided</li> </ul>
	Spring 2013	29% (322/1124)	
	Fall 2013	33% (1032/3084)	
Refinement (FG)	Spring 2014	8 (invited from students visited the MSC)	<ul style="list-style-type: none"> <li>Operation of and support given to students by the MSC</li> <li>How the MSC help and facilitate student learning</li> <li>Good and bad of the MSC</li> </ul>

QS – Questionnaire Survey; FG – Focus Group Discussion

# Evaluation: Initial Stage





# Sample Questions – Initial Stage

## Usage

- How much **time** on average did you spend on each online homework?
- How many **hours** have you spent per visit to the Math support session?
- What is/are your **purpose(s)** in visiting the Math support sessions?

## Learning impact

- What is your initial opinion on the usefulness of WeBWork in assisting your learning?
- Rating scale:
  - WeBWork homework has enhanced my **confidence** in studying Math.
  - Doing online homework can **consolidate** what I have learnt.

## Support provided

- Did you find the **text-based guidelines** about using WeBWork to be useful?
- Did you receive sufficient **instructions** for using WeBWork in class?
- Rating scale:
  - The tutoring **staff** at the Math support sessions is helpful.

## User-friendliness

- How would you describe the **user-friendliness** of WeBWork – the Online Homework System?
- How would you rate **the level of difficulty** of the online homework?

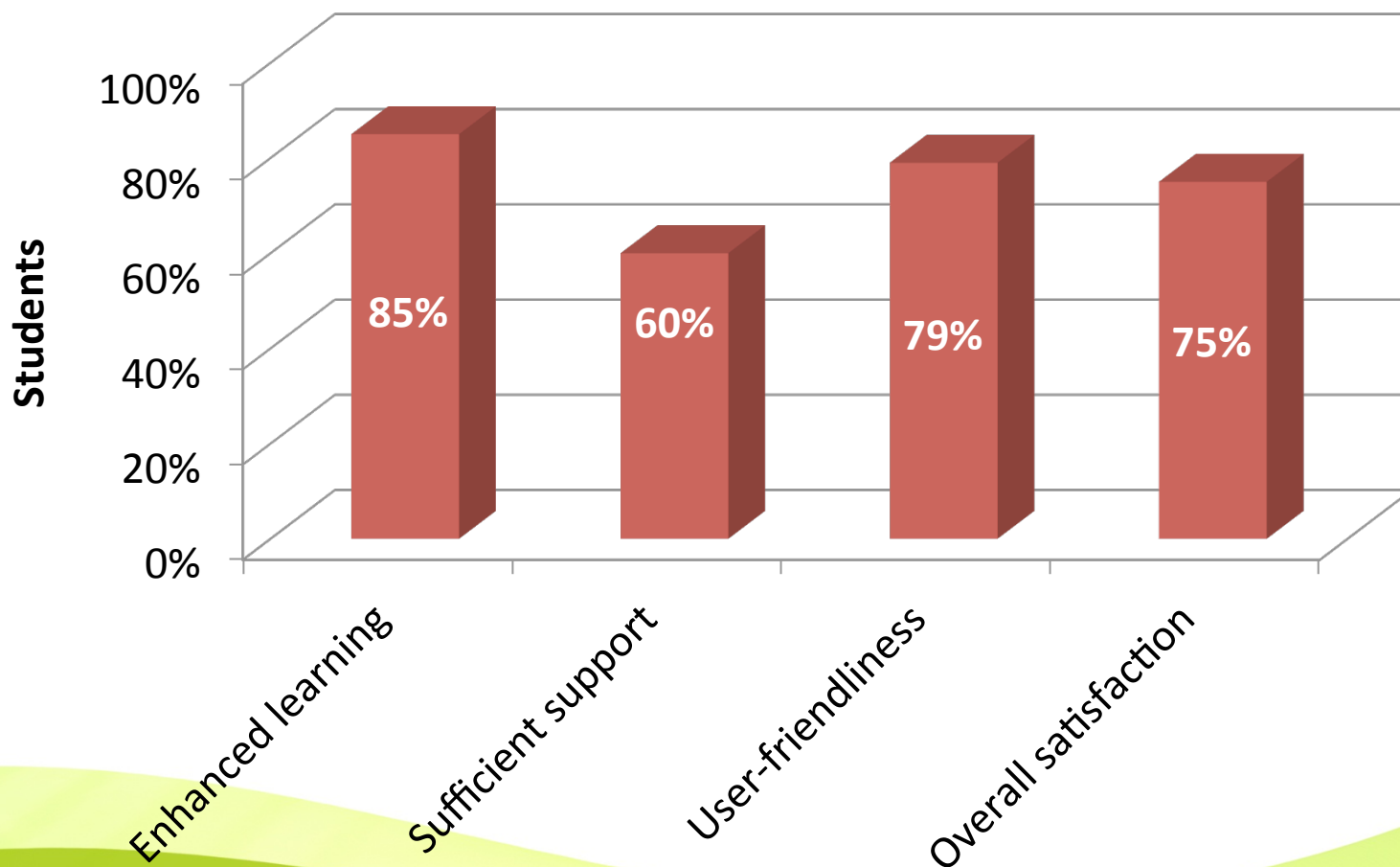
# Responses: Initial Stage

Technical issues	Percentage
WeBWork was user-friendly	Near 80%
Useful text-based guidelines / Could learn on one's own	45% / 43%
Sufficient instructions given in class	70%
Students' preference	Percentage
Preference towards online assignments	About 80%
Also used WeBWork to prepare for tests/exams	Near 60%

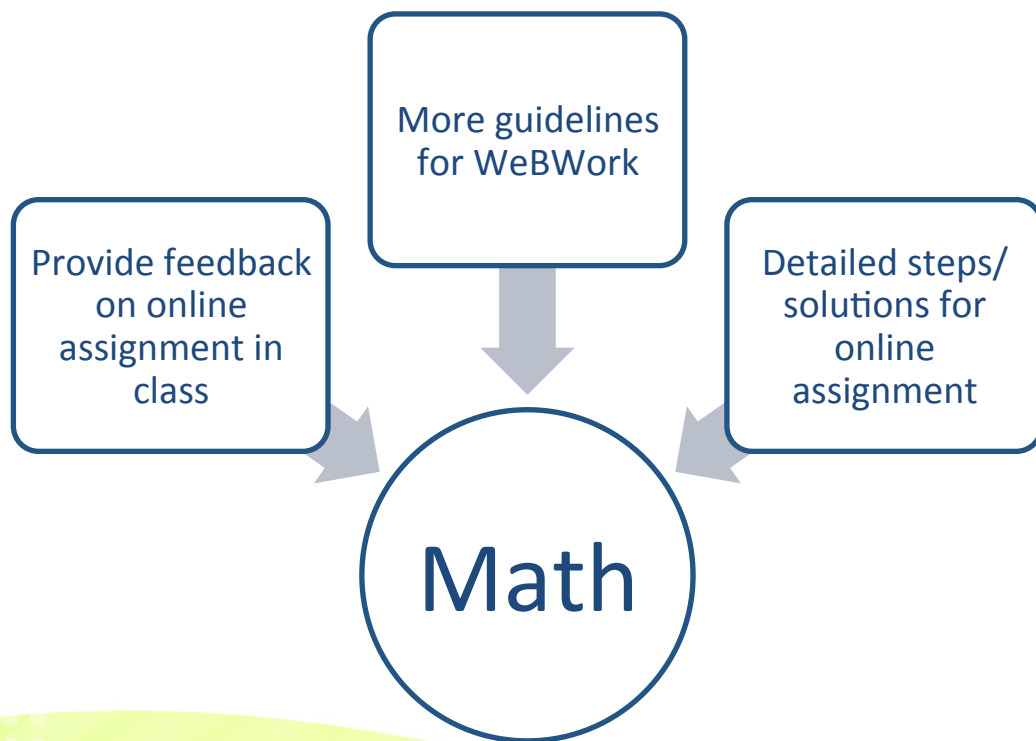


Impact on student learning	Percentage
More interaction with staff	Over 50%
Assisted learning (Mid-term → End-term)	55% → 80%
Informed learning + instant feedback helped learning	About 80%
Subject knowledge was enhanced and consolidated	About 90%
Enhanced computational and problem solving skills	About 70%
MSC	Percentage
To work on and get help for online assignments	About 70%
Helped students work through the online assignments	About 50%
Increased confidence in working on the assignment	About 50%
Enhanced interaction with staff	About 50%

# Key Findings – Initial Stage



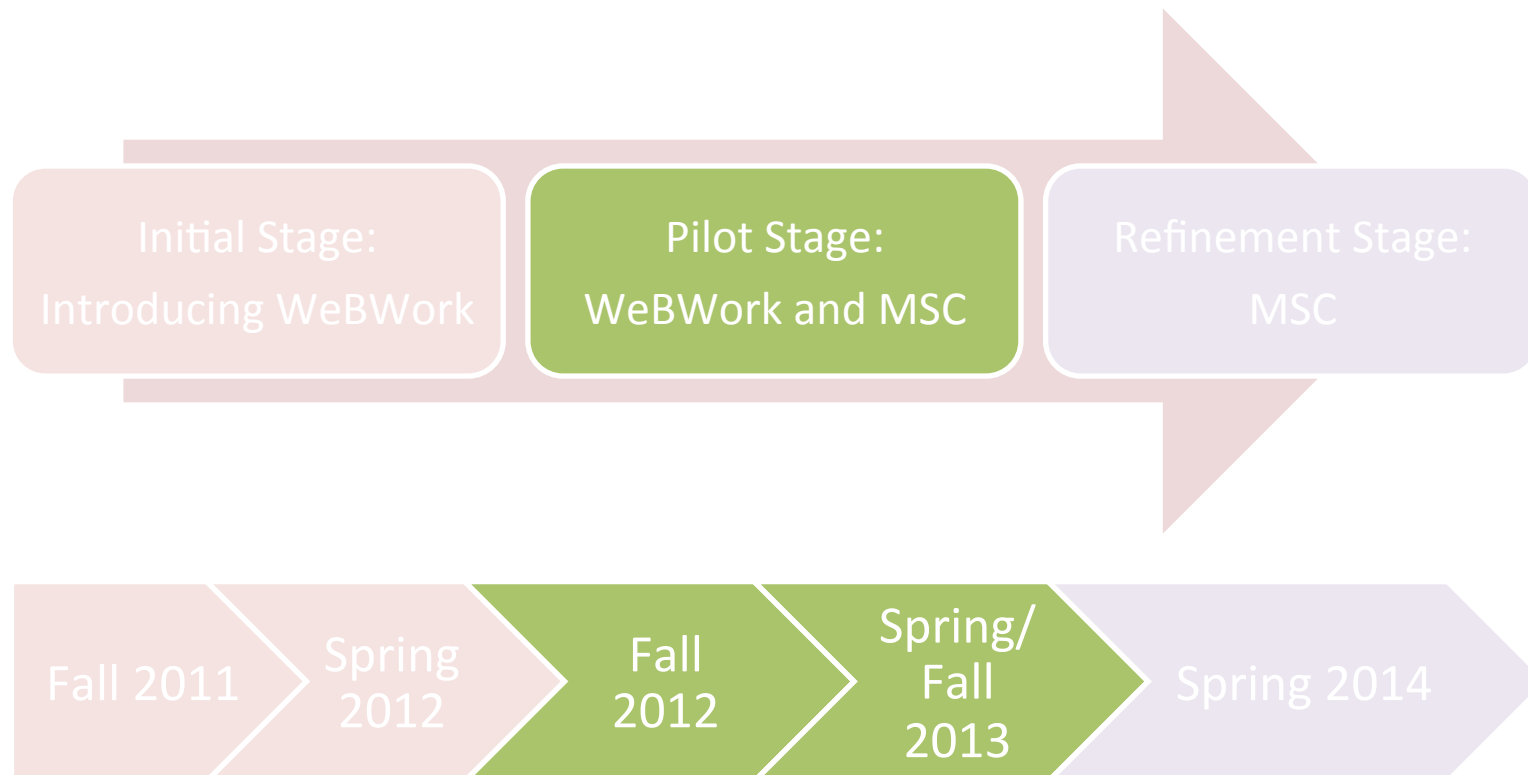
# Feed Forward to Math



## Establish the MSC

- Established at library's learning commons in Feb 2012
- Traditional tutorials and tutorials given in the MSC in alternative weeks
- Tutorials were on voluntary basis

# Evaluation: Pilot Stage



# Sample Questions – Pilot Stage

## Usage

- On average, how **long** did you stay in the MSC per visit?
- What is/are your **purpose(s)** in visiting the MSC?

## Learning impact

- Do you think your Math **attainment** has been improved by visiting the MSC?
- Rating scale:
  - I think my **competence** in Math has been improved by visiting the MSC.

## Support provided

- Rating scale:
  - The **staff** in the MSC is friendly and welcoming.
  - The tutoring **staff** at the MSC is helpful.

## User-friendliness

- How would you describe the **user-friendliness** of WeBWork – the Online Homework System?
- Have you received sufficient **instructions** for using WeBWork?

# Responses – Pilot Stage

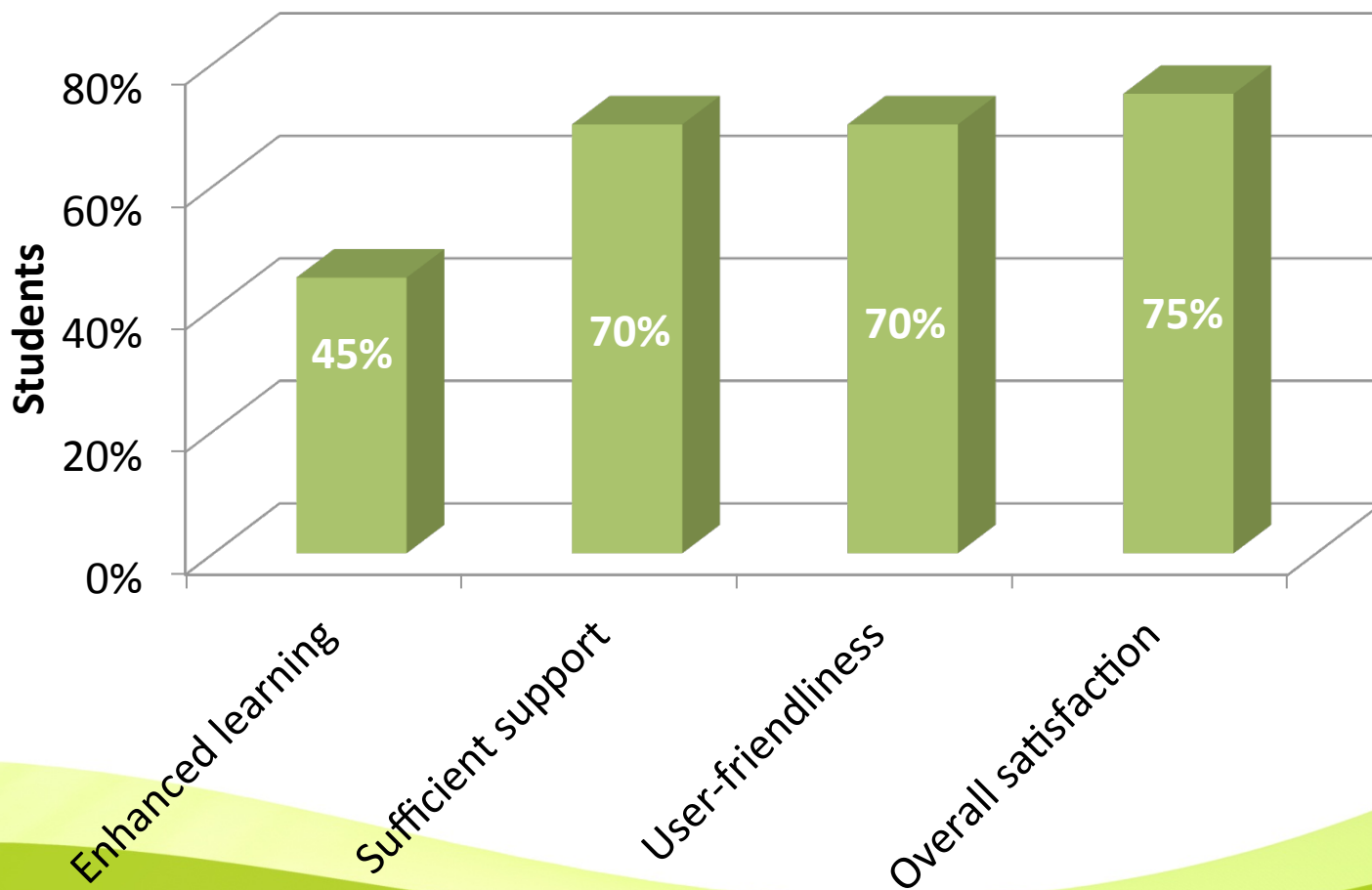
Usage of the MSC (Fall 2012, Spring and Fall 2013)	Percentage
Never visited the MSC	50% - 70%
<ul style="list-style-type: none"> <li>• lack of time</li> </ul>	45% - 60%
<ul style="list-style-type: none"> <li>• unaware of the provision of Math support in the MSC</li> </ul>	25% - 35%
<ul style="list-style-type: none"> <li>• lack of needs on Math support</li> </ul>	18% - 25%
Stayed in the MSC for < 2hours	77% - 90%
<ul style="list-style-type: none"> <li>• To work through and get help on Math assignments</li> </ul>	50% - 75%
<ul style="list-style-type: none"> <li>• To get one-on-one help from staff</li> </ul>	Over 80%
<ul style="list-style-type: none"> <li>• To get help from peers</li> </ul>	15% - 30%
<ul style="list-style-type: none"> <li>• To have small group tutoring</li> </ul>	Around 10%



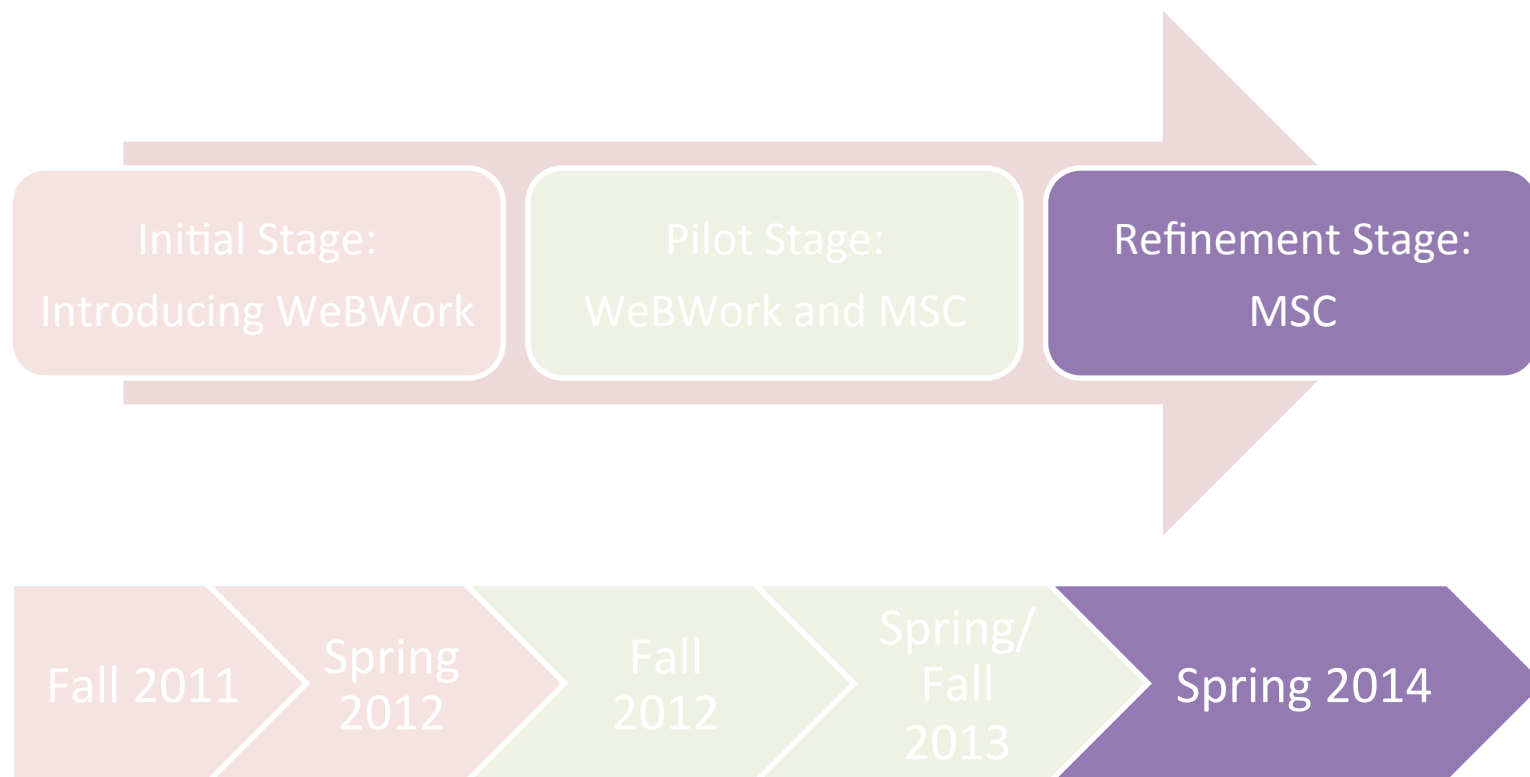
Satisfaction on the support provided	Percentage
No questions unanswered or just a few times	Over 90%
MSC staff was helpful and friendly	70% - 80%
Improvement of Math attainment	30% - 37%
Satisfied with the support provided	Over 70%

Note. More positive responses were collected in Spring 2013.

# Key Findings – Pilot Stage



# Evaluation: Refinement



# Focus Group Discussion

- *Visited regularly for revision*
- *Prior to assignment submissions/mid-term and final examinations*
- *Sought help from staff*
- *Helped them to better understand the Math concepts taught in class*
- *Became more proactive*
- *More interested in Math*
- *Nice, helpful, approachable and patient staff*
- *Proactive to offer help to students*
- *Suitable opening hours and physical setting*
- *Sufficient number of staff for each time slot*
- *Love to have one-on-one / small group tutorial*

## Location & opening hours

- In Spring 2014, the MSC has been relocated to Rm2612AB
- Opening hours: Mon to Fri, 11am – 7pm

## Staff

- 5 – 6 staff on duty for each hour

## Services

- Hold irregular and informal small group tutoring
- More seats available

## Promotion

- Signage, e-board, in-class promotion, on Math Departmental website, on WeBWork website

# Training for IAs and Student Helpers

- To recognize students' learning approaches and the implications underlying them
- To identify teaching approaches that bring about a positive impact on students
- To equip MSC staff with effective instructional skills and the ability to vary their instruction under different circumstances



# Evaluation Data – looking ahead

- Need improved learning analytics - individual students and courses
- Leverage integration with LMS for improved analytics – interoperability using IMS LTI standard to facilitate (Prof Gage mentioned work on interoperability)
- Triangulate quantitative data on mathematics learning with qualitative student perception data from surveys and focus groups

# Thank you!

A poster with an orange background and a white border. It features the Greek letter pi ( $\pi$ ) at the top, followed by the text "KEEP CALM AND LOVE MATH" in white, bold, sans-serif capital letters.

$\pi$   
KEEP  
CALM  
AND  
LOVE  
MATH