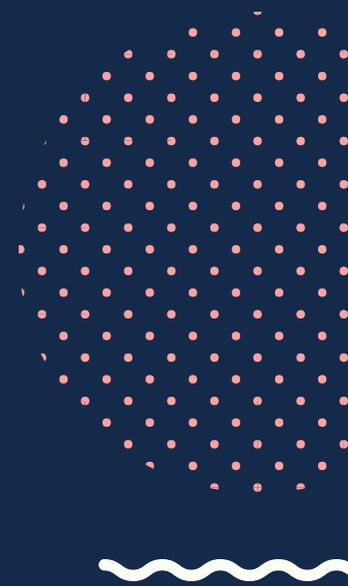




LU CHEN



A photograph of a workspace on a wooden desk. On the left, a silver laptop is partially visible, showing its keyboard and trackpad. To the right of the laptop is an open notebook with a grid pattern, and a black pen lies on its surface. The background is softly blurred, showing what appears to be a pair of glasses.

Project Overview

My team works with our client: Western Governors University (WGU), U.S., to help WGU students improve their career development fluency and learning fluency. We built an instructional online course module to teach career management skills. We prototyped a personalized online tool -- FastPass -- to help WGU students strategically solve their learning problems. The design process of FastPass is summarized in the following slides.

FastPass

A personalized learning tool designed to improve adult learners' meta-learning skills through practicing effective learning strategies to accelerate their learning.

Client: Western Governors University

My role: Research Lead (assigned)



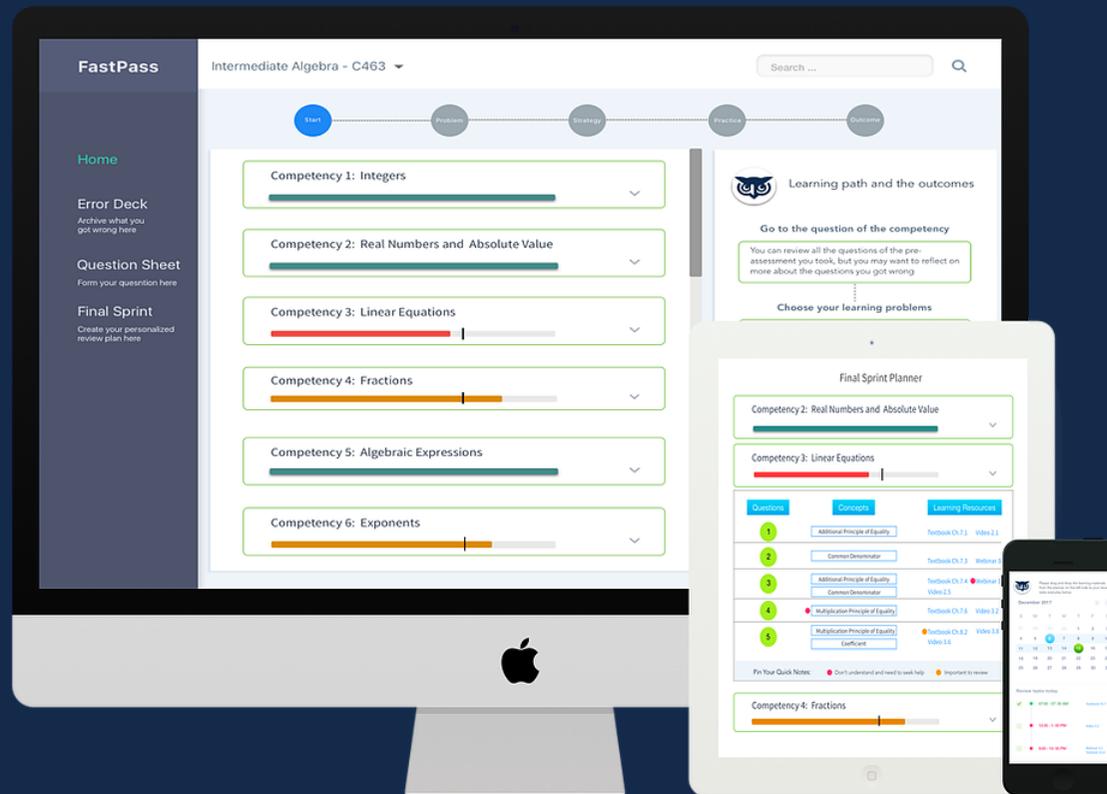
DESIGN PROBLEM:

WGU students don't strategically solve their learning problems while they expect to accelerate their learning to get the degree as soon as possible.

DESIGN SOLUTION:

Build a personalized learning tool to help WGU students solve the typical learning problems associated with the coaching report through scaffolding students to practice and use effective learning strategies.

Introducing FastPass



Feature 1

Guide the learners to use effective learning strategies to solve their learning problems

FastPass Intermediate Algebra - C463

Home
Error Deck
Question Sheet
Final Sprint

Competency 1: Integers
Competency 2: Real Numbers and Absolute Value
Competency 3: Linear Equations

1. Solve the linear equation using equivalent equations to isolate the variable. Express your solution as an integer, as a simplified fraction, or as a decimal number.

$y - 5 \frac{1}{3} = 7 \frac{2}{3}$

$y = 2$
 $y = \frac{1}{3}$
 $y = 4$
 $y = 2 \frac{2}{3}$

Your answer: 2
Correct answer: 4

Choose the problems

- I don't know why I got wrong
- I don't know how well I'm doing when reviewing the related learning materials
- I have questions to ask course mentor

Question: Competency 3, No.1
Problem: I don't know why I got wrong
Learning strategy recommended: Break it down

BREAK IT DOWN

To identify where you got stuck, you can think about the solution step by step, and identify which concepts are tested in each step. Click the "Next" button to use this strategy to figure out why you got wrong. The learning resources will be provided to help you improve the knowledge deficits.

Question: Competency 3, No.1
Problem: I have questions to ask course mentor
Learning strategy recommended: Formulate the question

FORMULATE THE QUESTION

To ask the good questions and get the feedback you want, you should carefully formulate the question. Click the "Next" button to use the question sheet to seek help from the course mentor. You will be guided to ask frame your question step by step and submit your question with one click.

The question the student got wrong in the pre-assessment. The questions are mapped with competencies and grouped under the correspondent competency.

The learning problems are generally categorized and the student is asked to choose the learning problem she or he has about this question.

Map the question, the learning problem and the effective learning strategy.

Explain in detail about what is this learning strategy, the value of this learning strategy and what to expect from the learning activities.

FastPass Intermediate Algebra - C463

Home
Error Deck
Question Sheet
Final Sprint

1. Solve the linear equation using equivalent equations to isolate the variable. Express your solution as an integer, as a simplified fraction, or as a decimal number.

$y - 5 \frac{1}{3} = 7 \frac{2}{3}$

Your answer: 2
Correct answer: 4

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The student is guided to solve the question step by step

FastPass chatbot is prompting the student to strategically think about the steps at the metacognitive level

Recaps the purpose of the learning activity

The student should think about the concepts needs to be used in each step first, and then compare the answer with the correct one. The student can directly review the concepts and worked examples with a single click without going out of FastPass

FastPass Intermediate Algebra - C463

Home
Error Deck
Question Sheet
Final Sprint

1. Solve the linear equation using equivalent equations to isolate the variable. Express your solution as an integer, as a simplified fraction, or as a decimal number.

$y - 5 \frac{1}{3} = 7 \frac{2}{3}$

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Choose the problems

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FORMULATE THE QUESTION

To ask the good questions and get the feedback you want, you should carefully formulate the question. Click the "Next" button to use the question sheet to seek help from the course mentor. You will be guided to ask frame your question step by step and submit your question with one click.

The student is guided step by step to frame the question

FastPass explains the value of doing each step

Recap on the purpose of the learning activity

Explains why setting the context of the question is important and how to ask specific question while the student is doing these activities.

Feature 2

Allow the learners to customize their own learning plans

FastPass Intermediate Algebra - C463

Home
Error Deck
Archive what you got wrong here
Question Sheet
Form your question here
Final Sprint
Create your personalized review plan here

Final Sprint Planner

Competency 2: Real Numbers and Absolute Value

Competency 3: Linear Equations

Questions	Concepts	Learning Resources
1	Additional Principle of Equality	Textbook Ch. 7.1 Video 2.1
2	Common Denominator	Textbook Ch. 7.3 Webinar 3.2
3	Additional Principle of Equality Common Denominator	Textbook Ch. 7.4 Webinar 3.2 Video 2.5
4	Multiplication Principle of Equality	Textbook Ch. 7.6 Video 3.2
5	Multiplication Principle of Equality Coefficient	Textbook Ch. 8.2 Video 3.6

Pin Your Quick Notes: ● Don't understand and need to seek help ● Important to review

Competency 4: Fractions

December 2017

S	M	T	W	T	F	S
27	28	29	30	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

Review tasks today

- 07:00 - 07:30 AM Textbook Ch.7.1
- 12:30 - 1:00 PM Video 3.2
- 9:00 - 10:00 PM Webinar 3.2 Textbook Ch.8.2

Please drag and drop the learning materials from the planner on the left side to your review tasks everyday below.

Prompts the student to drag and drop the concepts and the learning resources to the daily review tasks.

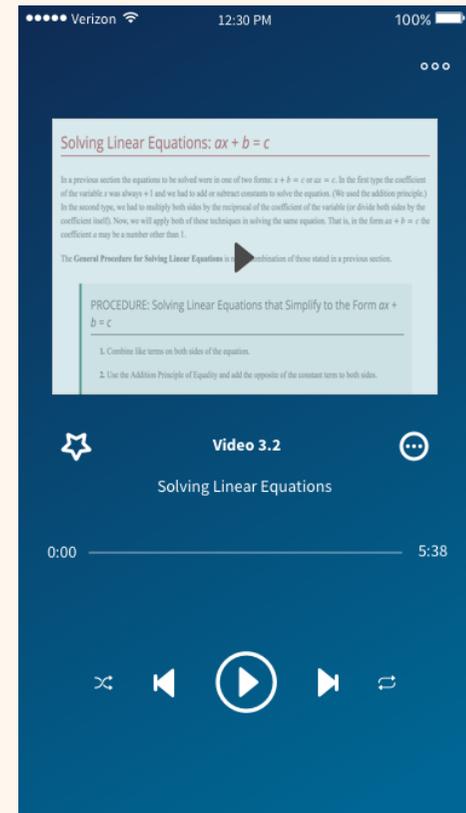
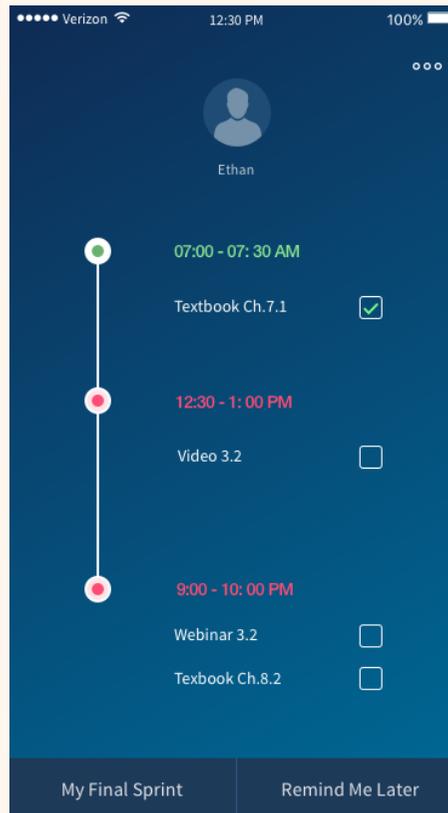
Visualizes the time to prepare for the final assessment

Visualizes how the review tasks are scheduled and if it is implemented as planned. The student can get the reminder from FastPass

The questions, concepts and the learning resources are mapped together, and are grouped based on the competency, which is the basic learning unit in WGU's learning system

Feature 3

Keep the learners on track





How we made it

The design process is not linear, but generally we went through four design stages:

Research Ideation Design Vision

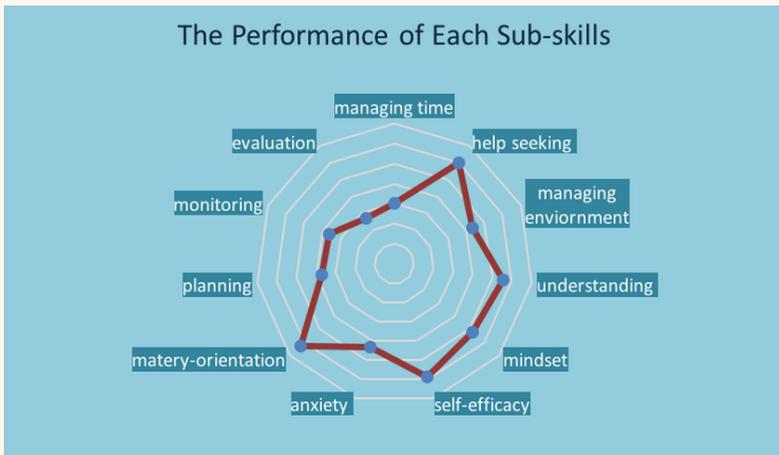
Research



- Literature Review → • Defined the Learning Fluency
- Learning Data Analytics → • Students' Strength and Weakness of learning skills
- User Interviews → • Students' learning goals, behavior, mindset and needs
- Cognitive Task Analysis → • Learning Goals Specification



RESEARCH



Learning Goals	Behavior Indicators	Instrucional Principles
What student will be able to do	How do we know student learn well or not	The instrucional strategies showed to be effective
Plan learning strategies based on needs	<ul style="list-style-type: none"> • Be able to articulate what they want to learn and the what resources they have; • Be able to articulate prior knowledge about the material to be studied; • Be able to choose the learning strategies according to the learning resources 	Feature-focusing Worked example
Use learning strategies to overcome learning challenges	<ul style="list-style-type: none"> • Be able to identify what they are having trouble with; • Be able to monitor what strategies worked well and what did not; • Be able to change the learning strategies correspondingly to solve the problem 	Worked example Self-explanation Spacing and testing
Self-evaluate the effectiveness learning strategies	<ul style="list-style-type: none"> • Be able to identify the areas for improvements; • Be able to summarize the effective strategies according to the learning resources; • Be able to use resources (e.g., ask a teacher, read the textbook) to clarify confusions before attempting another assignment of this type 	Worked example Self-explanation Accountable talk

Ideation



- Affinity Diagramming



- User Journey Map
- Persona

- Brainstorming



- Sketching
- Wireframing

- Learning Science



- Mapping the learning problems, needs and strategies



IDEATION



"I like online learning because I can learn at my own pace. But I realize how challenging it could be. I often got off the track due to my busy work schedule and family life. I also need to be very good at using supplementary learning resources to learn more holistically."

Ivy Rice

Age: 36

WGU Major: Business Management

Employment: Full-time

Occupation: HR Manager

Status: Married

Enrollment: Three Terms

Ivy's goal is

To get a Bachelor's degree to get a higher paying job and expand her career opportunities.

Ivy's frustrations are

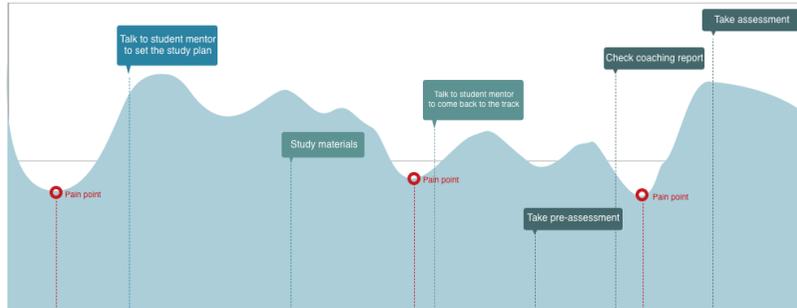
Has to constantly change her study plan due to busy schedule; Usually spent lots of time on navigating and searching the useful learning resources.

Ivy's study pattern:

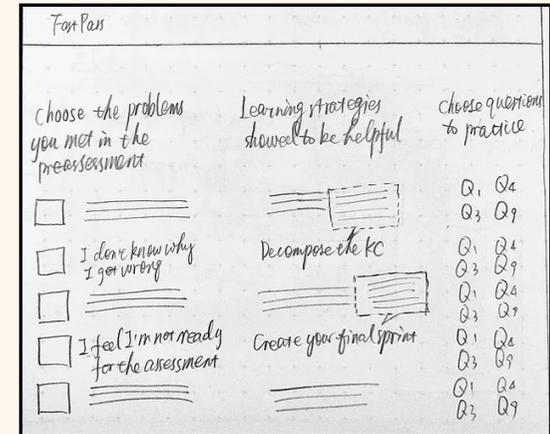
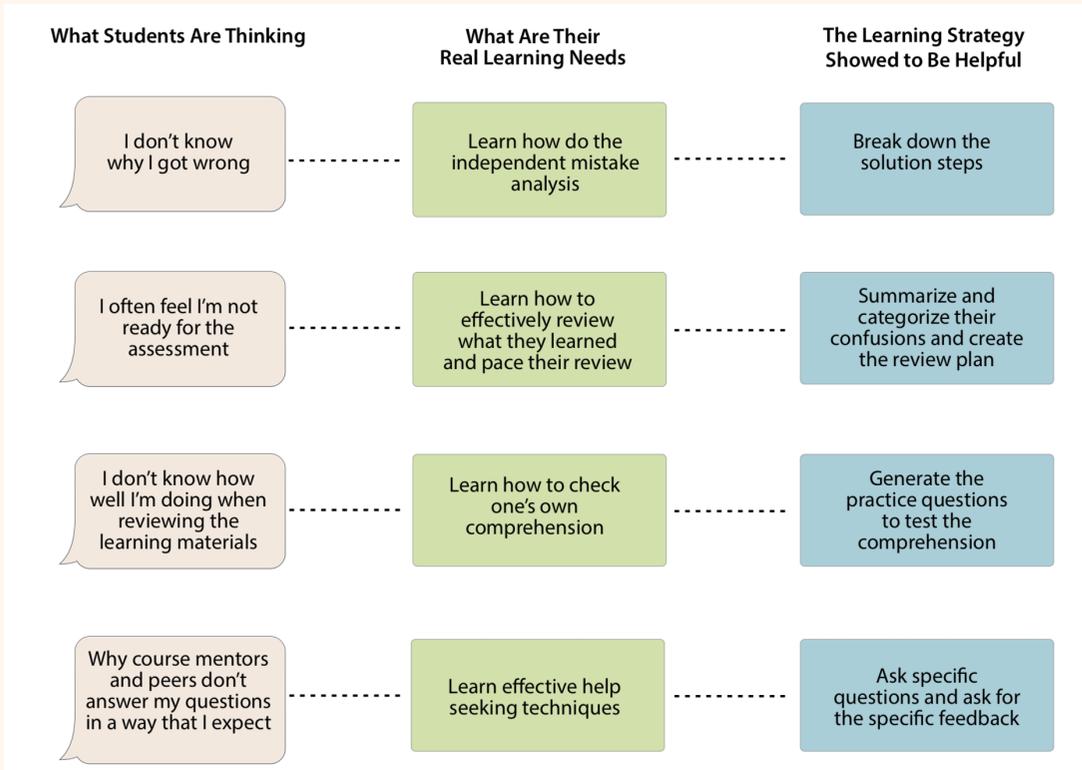


WGU Students Learning Experience Journey Map

(Within One Course)

Guiding Principles	Students go to WGU because they can learn at their own pace	Students constantly adjust their study plans to balance their work, study and family	Students want to accelerate their learning in WGU to get the degree as soon as possible
Stages	Planning	Monitoring	Evaluating
Actions	<p>"I don't have the micro level goal. I like how many hours I must spend on my study. I never find it is useful for me. But I do have the macro level goal. I work with my student mentor to plan when I should take the assessment."</p> <p>Students self-evaluate their prior knowledge, talk to student mentors, and click around the information and learning resources, to estimate when they would be able to take the pre-assessment and assessment.</p>	<p>"I work with my student mentors to set my study plan, but it is hard to follow the plan. I often got off the track due to my work and family, and I have to turn to my student mentor again and again to figure out how to come back to the track. I don't really know how to effectively check my comprehension during studying."</p> <p>To pass the assessment as planned, students implement their study plan that is either created with their student mentors or by themselves. They study the learning materials and use various learning resources to comprehend the required competencies (knowledge components).</p>	<p>"If I didn't pass the 'cut score' of the pre-assessment, I would check the coaching report and go back to the competencies. I wouldn't go back to the textbook because I already read them. I would go to other learning resources."</p> <p>Students usually take pre-assessment after studying the learning materials. They adopt almost the same approach that is used during studying when they review the competencies if they didn't pass the "cut score".</p>
Emotional Experience			
Opportunities	<p>Pain points: Students are scared of taking pre-assessment even if they know the pre-assessment may help them to assess their prior knowledge. They feel demotivated if they couldn't pass the "cut score".</p>	<p>Pain points: Students often miss their micro level study goals. Many of them can't guarantee the time and energy spent on their study every day. They feel frustrated when they found they are off the track. If it happens too often, students will tend to drop out.</p>	<p>Pain points: If students fail the "cut score" of the pre-assessment, they can only get limited information from the coaching report. They struggle both academically and emotionally about how to quickly identify which knowledge components they need to improve and how to improve them.</p>

IDEATION



Final Sprint

May
27

Planned Assessment Date

May 2016

Mo	Tu	We	Th	Fr	Sa	Su
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

Question	Concepts	Learning Resources
Q3	<div style="display: flex; gap: 5px;"> <div style="background-color: #333; color: white; padding: 2px 5px; font-size: 8px;">Concept</div> <div style="border: 1px solid gray; border-radius: 50%; width: 15px; height: 15px; display: flex; align-items: center; justify-content: center;">●</div> </div>	<div style="display: flex; gap: 5px;"> <div style="border: 1px solid gray; padding: 2px 5px; font-size: 8px;">E1</div> <div style="border: 1px solid gray; padding: 2px 5px; font-size: 8px;">E2</div> </div>
Q7	<div style="display: flex; gap: 5px;"> <div style="background-color: #333; color: white; padding: 2px 5px; font-size: 8px;">Concept</div> <div style="border: 1px solid gray; border-radius: 50%; width: 15px; height: 15px; display: flex; align-items: center; justify-content: center;">●</div> </div>	<div style="display: flex; gap: 5px;"> <div style="border: 1px solid gray; padding: 2px 5px; font-size: 8px;">E1</div> <div style="border: 1px solid gray; padding: 2px 5px; font-size: 8px;">E2</div> </div>
Q9	<div style="display: flex; gap: 5px;"> <div style="background-color: #333; color: white; padding: 2px 5px; font-size: 8px;">Concept</div> <div style="border: 1px solid gray; border-radius: 50%; width: 15px; height: 15px; display: flex; align-items: center; justify-content: center;">●</div> </div>	<div style="display: flex; gap: 5px;"> <div style="border: 1px solid gray; padding: 2px 5px; font-size: 8px;">E1</div> <div style="border: 1px solid gray; padding: 2px 5px; font-size: 8px;">E2</div> </div>

Manual Auto

Please drag and drop the concepts and learning resources to your review timeline

Remind me to review:

Every Morning

Every Night

Other Time

Review Tasks

Review Tasks

Review Tasks

Review Tasks

Assessment

May 23
May 24
May 25
May 26
May 27

Review Tasks

Review Tasks

Review Tasks

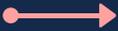
Review Tasks

Assessment

May 23
May 24
May 25
May 26
May 27

Design



- User Testing  • Validated the design assumptions and iterated the design
- Learning Design Experts Consulting  • Got suggestions of Learning experience design



DESIGN

Need:

Want to quickly find out which learning resources can be helpful when get stuck.

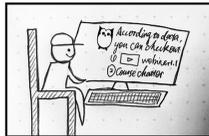
Lead Question:

When you get stuck during your learning, which learning resources you will turn to? How do you navigate them? How do you know they would be helpful?

Owl Assistant



Tony gets stuck on a algebra question and he is not sure if he should go back to re-read the textbook or ask course mentor.



He clicks the Owl Assistant and the Owl Assistant immediatly gives him suggestions in terms of which learning resources he can turn to based on the log data of other students stuck in the same/similar questions.



Need:

Want to be more prepared for the assessment by reviewing the learning materials more effectively and efficiently

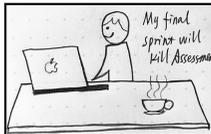
Lead Question:

When and how do you prepared for your assessment? Do you think your review effectively help you pass the assessment?

Final Sprint



Kim used to be very anxious about the assessment because he is not confident about his learning in that course and not sure how to prepare for the assessment.



Now he uses the final sprint to prepare for the assessment. The final sprint archived all the mistakes he made in the pre-assessment, the learning materials he needs to review, and set the review plan for him. He feels much more confident about the assessment now.



Need:

Want to quickly come back to the study track if get off the track because of the busy life schedule.

Lead Question:

What would you do if you find yourself get off the study track? How do you monitor your study progress?

SmartPlanner



Vincent has not been worked on WGU courses for two weeks due to his crazy busy full-time work schedule at the end of the fiscal year. He has to re-plan his study and hopes to catch up quickly.



He turns on the SmartPlanner. It helps him identify where he is now in the progress, automatically update a new study plan for him, and break down the plan in the daily base. Vincent quickly comes back to the track.

DESIGN

The screenshot shows the 'FastPass' interface for 'Intermediate Algebra - C463'. The main content area is divided into two sections. The left section, outlined in red, shows a problem: '1. Solve the linear equation using equivalent equations to isolate the variable. Express your solution as an integer, as a simplified fraction, or as a decimal number.' Below the problem, it says 'Your answer: 2' and 'Correct answer: 4'. The equation is $y = 5/3 - 7/3$. The user has entered '3' for the constant, and the correct answer is '5/3'. The right section, also outlined in red, shows a chatbot prompt: 'You are using: **ASK IT DOWN** to know why you got wrong'. Below this, it asks 'Please select the concept should be used in Step 2:' with three options: 'Additional Principle of Equality' (checked), 'Least Common Multiple', and 'Common Denominator'. A 'Next' button is at the bottom. A sidebar on the left contains navigation links: Home, Error Deck, Question Sheet, and Final Sprint.

Recaps the purpose of the learning activity

The student should think about the concepts needed to be used in each step first, and then compare the answer with the correct one. The student can directly review the concepts and worked examples with a single click without going out of FastPass

The student is guided to solve the question step by step

FastPass chatbot is prompting the student to strategically think about the steps at the metacognitive level

The screenshot shows the 'FastPass' interface for 'Intermediate Algebra - C463'. The main content area is divided into two sections. The left section, titled 'Final Sprint Planner', shows a progress bar for 'Competency 2: Real Numbers and Absolute Value' and 'Competency 3: Linear Equations'. Below this, there is a table with columns for 'Questions', 'Concepts', and 'Learning Resources'. The table lists five items, each with a number in a circle and corresponding resources. The right section shows a calendar for December 2017 with a grid of days. Below the calendar, there is a 'Review tasks today' section with three tasks: '07:00 - 07:30 AM' (Video 1.1), '12:30 - 1:00 PM' (Video 1.2), and '8:00 - 10:00 PM' (Webinar 1.2, Tables Ch.1.2). A sidebar on the left contains navigation links: Home, Error Deck, Question Sheet, and Final Sprint.

Prompts the student to drag and drop the concepts and the learning resources to the daily review tasks.

Visualizes the time to prepare for the final assessment

Visualizes how the review tasks are scheduled and if it is implemented as planned. The student can get the reminder from FastPass

The questions, concepts and the learning resources are mapped together, and are grouped based on the competency, which is the basic learning unit in WGU's learning system

Vision



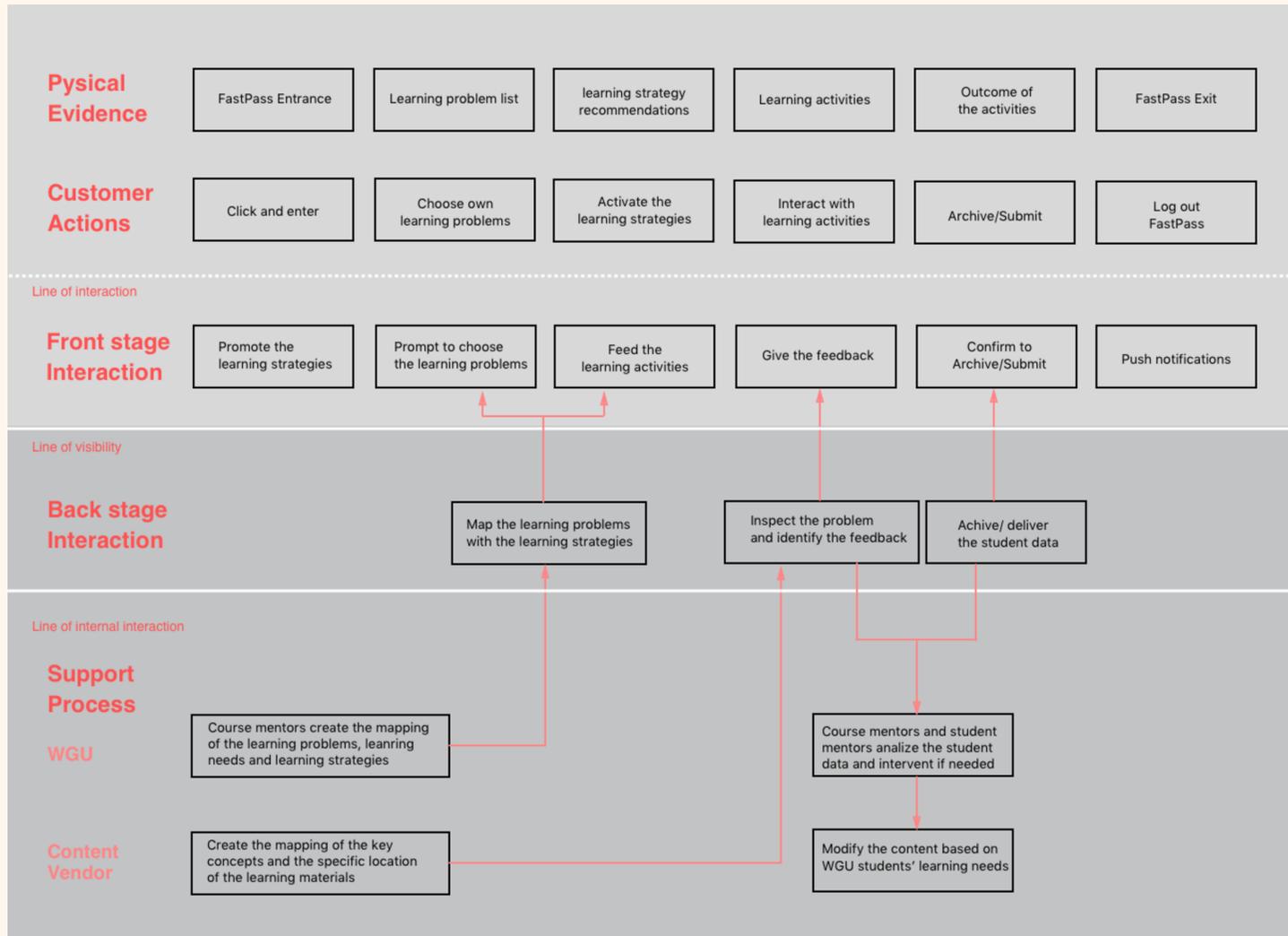
- Think for the whole WGU ecosystem



- Service Blueprint
- The immediate and long-term value of FastPass for WGU



Service Blueprint





Immediate Value:

- Be able to do the independent mistake analysis;
- Be able to better prepared for the assessment;
- Knows how to effectively seek help in the learning process.

Long-term Value:

- Improve their metacognitive level learning skills to better plan, monitor and evaluate their learning process, so that they become the effective learners of any circumstances.

Immediate Value:

- Better understanding of WGU students' learning behavior patterns;
- Improve the efficiency and effectiveness of learning service (e.g. the course mentors and the student mentors) based on the student data collected through FastPass;
- Gain insights for the curriculum design and content purchase.

Long-term Value:

- Stand out from competitors through not only giving students personalized learning experience, but also helping students become the effective learners.



What I Learned



The learning experience design and the learning content design should go hand in hand.

The learning experience can only be good when the learning content take into account the learners' characteristics, such as age, background, study environment and routine, to address their needs.



The learning design should fill the gap between the teaching objectives and the learning needs.

The educator's teaching objectives and the learner's learning needs are not always matched. It is the learning designer's job to explicitly connect the teaching objectives and the learning needs through design.



What should the learning design aim for? Knowledge delivery? Or effective learners?

We can't blame the students for only focusing on the knowledge itself or the assessments if the learning experience we created neglect to teach them how to better navigate, digest and utilize the knowledge to solve problems. The fundamental goal for the curriculum design or any learning design should be teaching students to become the effective learners.



**Please see more about my skills and experience at:
www.luchendesign.com**



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