

Action Research Fellow: KC Walsh	
Title:	Project Boxsand
Context:	Physics 201 (Algebra-based)– 550/600 enrollment – “flipped” classroom where most content delivery is online
Short Description:	Students in this class interact with content and ideas online, and use class time for problem solving and critical thinking. The primary goal of this research is to understand more about how students interact with online physics content.
Research Questions:	The guiding research questions are (a) what content is accessed, (b) what order it is accessed in, and (c) how does that interaction correlate with performance on exams and concept inventory gains.
Proposed Data Collection	Fall 2015 Tracking – how students access course information on the website (videos, links, assignments, etc.) Concept inventory – pre and post Performance on exams Survey about experience with online learning tools
Questions and Concerns	For Melissa Dancy: Q1: To understand how students engage with content, and what they would like to see about accessing content in the future, should I use a questionnaire or a focus group? Q2: I've seen examples of parts of my project, i.e. repositories of clicker questions, example problems, content, simulations, etc., but I've never seen these all together in one place, with resources for learners and educators, complete with tracking what content and in what order the content is presented works best. Why? This seems like something someone has done before. Q3: How can I work to expand this model to other departments/institutions? What barriers do you foresee?

## Appendix: Survey questions

Exit survey (Qualtrics – On-line survey)

\*\*\*\*This is a rough draft of the questions. My hope is to give IRB a feel for the type of questions and turn the final draft in for review as an addendum before the survey is released. \*\*\*

### Role of the Textbook (T)

(Q.T.1) What percentage of your out-of-class access to content came from the BoxSand website as opposed to from the *Knight College Physics* textbook?

80 – 100 %

60 – 80 %

40 – 60 %

20 – 40 %

0 – 20 %

(Q.T.2) Do you feel the class textbook, *Knight College Physics*, is a necessary tool in your learning process if open source online resources like those found on the BoxSand website are available?

Strongly agree

Agree

Indifferent

Disagree

Strongly Disagree

### Online Content Sources (C)

(Q.C.1) Rank the common online resources (listed below) found on the BoxSand website, based on their usefulness in your learning. Start with the least useful.

KC's videos

Hyperphysics

OpenStax Open Source Textbook

Phet Interactive Simulations

Other: \_\_\_\_\_

(Q.C.2) Consider the online resource you found most useful and choose why you found it the most useful. Select all that apply.

Short and sweet

Long and verbose, and thus more thorough

Interactive

Simple text (not interactive)

I prefer videos over text

(Q.C.3) When learning about a topic (e.g. 2<sup>nd</sup> law, friction, UCM), which of the pages with links/content did you find most useful.

Specific learning objectives/goals

Content

Concept Map

Algorithm/recipe/checklist/procedure

Multiple representations

Common misconceptions

Going between representations

Key terms

Problem examples

In class engagement activities (e.g. clicker questions)

Out of class engagement activities (e.g. simulations)

(Q.C.4) Each topic has a page called *Content*. An example would be that from inclined-planes (<https://boxsand.physics.oregonstate.edu/PH201/Mechanics/Special-Case-Studies/inclined-plane/content>) Rank the usefulness of each of the resources found on that page (not specific to inclined planes but in general) in your learning.

Short description/introductions

KC's content

Key terms

Primary external resource

Secondary external resource

Additional studying/review

### **Feelings towards the site (F)**

(Q.F.1) Overall what is your feeling towards the organization (not the content) of the BoxSand site?

Very well organized

Well organized

Sufficient organization

Not very well organized

Completely unorganized

(Q.F.2) Overall what is your feeling towards the content on the BoxSand site?

Very good content

Good content

Some useful content

Not very useful content

Very poor and unusable content

(Q.F.3) How do you feel about the correlation with the content on the BoxSand site with the class overall.

All the content is directly relatable and useful in the course

For the most part the content is related to what's covered in class

Some of the content was relevant to the overall course

Very little of the content appeared to be about stuff covered in the class

None of the content appeared to have anything to do with the class

**Path to Mastery Variance (V)**

(Q.V.1) How often did you follow the Daily Learning Guide?

Always

Often

Sometimes

Not very often

Never

(Q.V.2) How often did you click around links not directly suggested on the Daily Learning Guide?

Always

Often

Sometimes

Not very often

Never

(Q.V.3) Do you think the Daily Learning Guide presents a clear path to mastery?

Yes

For the most part

Somewhat

Not very much

Not at all