Large TLEF Project Completion Report

Report Completion Date: (2016/02/17)

1. PROJECT OVERVIEW

1.1. General Information

Project Title:	*2013FL1_ARTS_PSYC_Barnes*		
Principal Investigator:	*Steven Barnes*		
Project Initiation:	*July 2013*	**Project Completion:**	*October 2015*

1.2. Project Summary *There are two elements to this project: A) Lecture annotation and B) Online modules*

A) The goal with this approach is for students to have more control over their learning and the contents of the course by: 1) Encouraging them to raise questions while they work through the modules and in class, 2) to choose topical directions in class, 3) to annotate class slides as they listen to lecture materials or presentations, and 4) annotating and extending the contents of the online course modules.

B) The goal here is for students to access and interact with comprehensive learning resources that will prepare them for in-class learning activities. Online modules will provide self-guided learning resources that will prepare students for in-class discussion and collaborative activity.

1.3. Team Members - *(Please fill in the following table and include **students**, undergraduate or graduate, who participated in your project).*

Name	Title/Affiliation	Responsibilities/Roles
Chandra Jade	UBC Graduate student	Video Editing of all chalkboard-based stop-motion animations
Soma Barsen	UBC Undergraduate student	Animation and direction of https://www.youtube.com/watch?v=SIp_CTEfiR4
Linnea Ritland	UBC Undergraduate student	Video Editing of https://www.youtube.com/watch?v=SIp_CTEfiR4

1.4. Student Impact - *Please fill in the following table with **past**, **current** and **future** courses that have been or will be impacted by your project, including any courses not included in your original proposal. [Note: Adapt this section to the context of your project as necessary].*

Course	Section	Enrolment	Term
PSYC 304	901	153	2014-2015 Winter 1-2
PSYC 304	921	60	2015 Summer 1-2

PSYC 360	001	~60	2014-2015 Winter 1-2
PSYC 360	001	64	2015-2016 Winter 1-2
PSYC 306A	002	~120	2015 Winter 2
PSYC 306A	002	120	2016 Winter 2
BIOL 112	(all)	~800	2014-2015 Winter 1/2
BIOL 112	(all)	~800	2015-2016 Winter 1/2
BIOL 200	(all)	~1100	2014-2015 Winter 1/2
BIOL 200	(all)	~1100	2015-2016 Winter 1/2

2. PRODUCTS AND ACHIEVEMENTS

2.1. Products and Achievements - *Please **update** project products and achievements as necessary. Indicate the current location of such products and provide an URL if applicable.*

Product(s)/Achievement(s):	Location:
6 open access course modules	psyc304.metaplasticity.com (see 'Learning Modules'); https://www.youtube.com/channel/UCtmSOy9CN_Y6psG4UysNwUw;
Implementation of CLAS for video annotation	Not implemented (see below)
Chalkboard-based stop-motion animations to support the online modules	https://www.youtube.com/channel/UCtmSOy9CN_Y6psG4UysNwUw;
One long hand-drawn animation on the topics of Donald Hebb and Long-Term Potentiation	https://www.youtube.com/watch?v=SIp_CTEfiR4
Javascript animation	http://psyc304.metaplasticity.com/learning-modules/divisions-nervous-system/
On-slide live lecture comments and polling using Poll Everywhere.	n/a

2.2. Item(s) not Met - *Please list intended project products and achievements that were not attained and the reason(s) for this.*

Item(s) Not Met:	Reason:
Implementation of CLAS for video annotation	No longer seemed relevant once the decision to use chalkboard-based stop-motion animations was chosen as the medium. Moreover, because the videos were housed on Youtube and embedded in a personal course website, it did not seem practical or feasible to implement this feature.

3. PROJECT EVALUATION

3.1. Project Outcomes - *Please list the intended outcomes or benefits of the project for students, TAs and/or instructors.*

1. A series of videos that use innovative and engaging chalkboard-based stop-motion animations to simplify complex biological and/or psychological topics.

2. Learning modules that the videos are embedded in that contain self-test questions for students.

3. An experimental javascript-based interactive module, that incorporates chalkboard-based stop-motion animation, that allows students to explore the overall structure of the nervous system.

3.2. Findings – *Please describe the findings of your project evaluation effort: to what extent were intended project outcomes achieved or not achieved? You are encouraged to include both graphical representations of data as well as scenarios or quotes to represent key themes.*

The videos have been a great success, as illustrated by their rapid adoption by other instructors in the Departments of Psychology and Biology. Feedback from students about the videos has been positive--most students just want to see more of them to better support their learning. However, it should be noted that some instructors are not using them to support a flexible learning approach, but are rather showing the videos in class as part of their lectures (I know this from personal communications with individual UBC instructors who have chosen to use my videos).

The videos were profiled on the psychology department website and on ubc.ca. The video that was promoted on the psych.ubc.ca website (i.e., https://www.youtube.com/watch?v=CcMHED902AQ) has seen a steady growth in number of views (see data in section 3.3, below).

The video production process itself was profiled on the CTLT website (i.e., https://www.youtube.com/watch?v=WcZCplZi6o8). Analytics for that promotional video can be found in section 3.3, below.

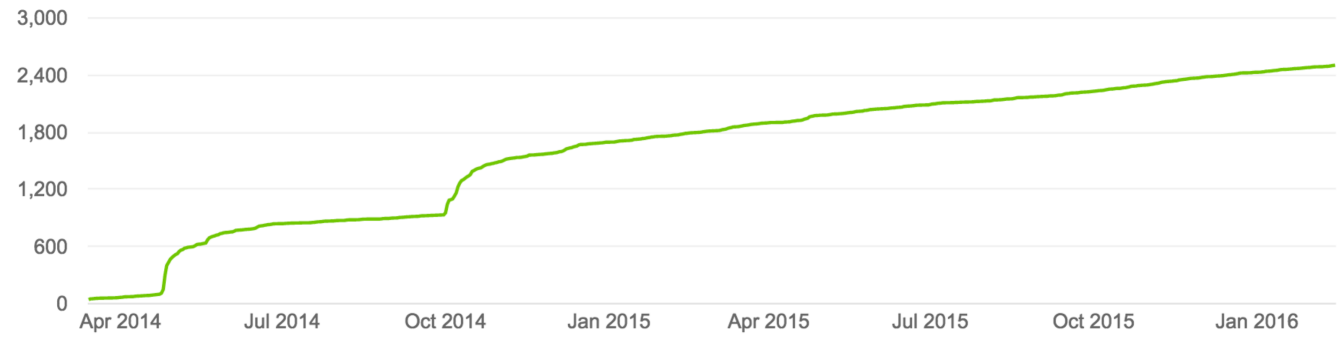
Moreover, I have noticed an improvement in performance on the first exam in PSYC 304, which, in part, covers the materials contained in the learning modules that were developed as part of this project.

3.3. Data Collection and Evaluation Methods - *Please describe the data collection strategies used, how the data was analyzed, and perceived limitations.* ***Note: Please attach copies of data collection tools (e.g., surveys and interview protocols), any additional data or other relevant items.***

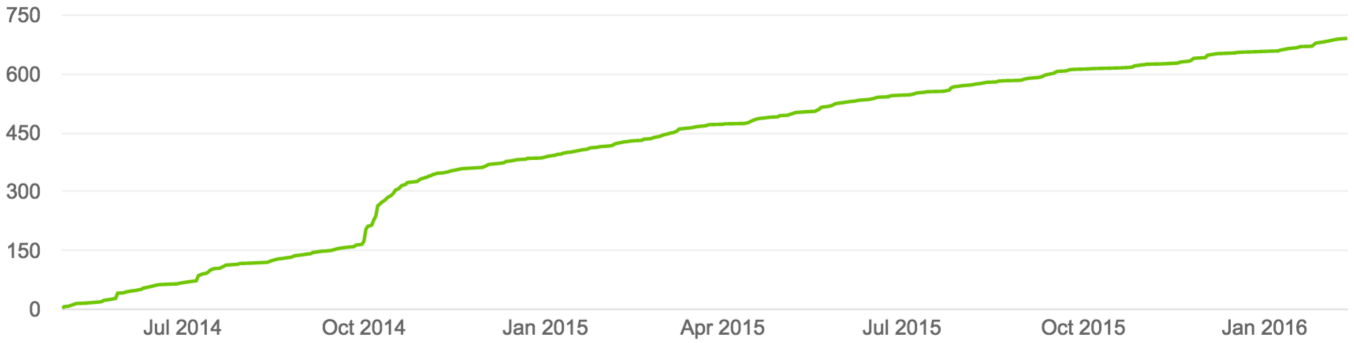
My plan had been to give exit surveys to students in my 2015-2016 offering of PSYC 304, but since I was given a teaching release for the development of a MOOC for edX that plan was curtailed. So, my current plan is to offer an exit survey to students when I offer PSYC 304 in 2016-2017. The survey questions had already been constructed (see Appendix 1).

Anecdotally, the feedback from students about the learning modules and videos has been extremely positive. Moreover, as noted earlier, I have noticed an improvement in performance on the first exam in PSYC 304, which covers the materials covered in the learning modules.

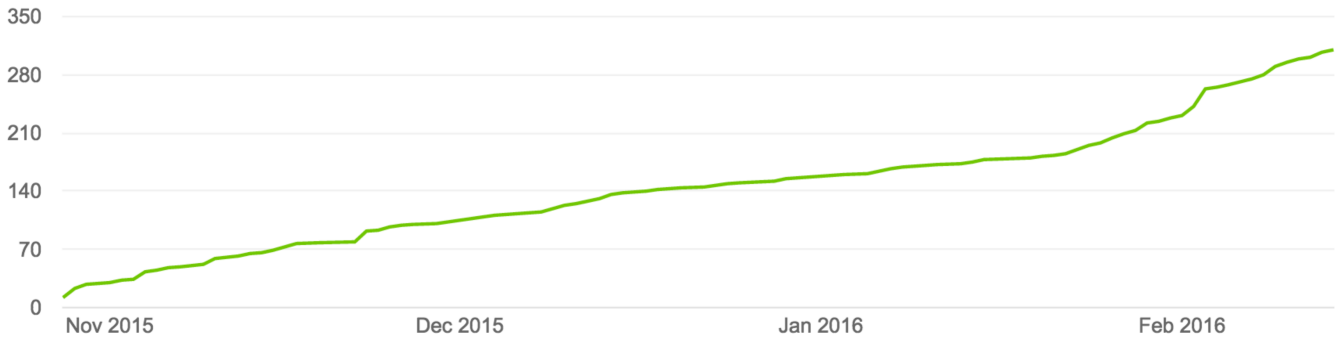
Web analytics has been another source of information about the success of the videos, in particular. For example, below is a graph of the growth in views of the one video that was promoted on the psych.ubc.ca website



The video about the chalkboard-based stop-motion animation production process, that was profiled on the CTLT website (i.e., https://www.youtube.com/watch?v=WcZCplZi6o8), has shown a steady increase in the number of views (see graph below), indicating that people are interested in the production process for making these chalkboard-based stop-motion animations.



The hand-drawn animation that was produced with the help of Soma Barsen, UBC undergraduate student, has shown a steady increase in viewership since it's presentation at the annual Society for Neuroscience conference in Chicago in November 2015, as shown in the graph below.



Below is a table of all views of videos on the YouTube channel hosting the videos produced as part of this flexible learning initiative grant from January 2014 to January 2016. As you can see, there has been global viewership of these videos, with the majority of views coming from the United States. This table indicates that the videos are being viewed outside of the UBC community by a wide variety of individuals from diverse backgrounds.

Geography	Watch time (minutes)	Views	Average view duration
United States	6,122 (39%)	2,988 (37%)	2:02
Canada	3,617 (23%)	1,919 (24%)	1:53
United Kingdom	691 (4.4%)	361 (4.5%)	1:54
India	396 (2.5%)	222 (2.8%)	1:47
Australia	355 (2.3%)	171 (2.1%)	2:04
Portugal	276 (1.8%)	103 (1.3%)	2:40
Malaysia	256 (1.6%)	135 (1.7%)	1:53
Egypt	238 (1.5%)	133 (1.7%)	1:47
Philippines	202 (1.3%)	104 (1.3%)	1:56
South Africa	198 (1.3%)	92 (1.2%)	2:09
Germany	182 (1.2%)	121 (1.5%)	1:30
France	170 (1.1%)	103 (1.3%)	1:39
Qatar	165 (1.1%)	62 (0.8%)	2:39
Netherlands	150 (1.0%)	78 (1.0%)	1:55
Israel	147 (0.9%)	75 (0.9%)	1:57
Saudi Arabia	110 (0.7%)	55 (0.7%)	2:00
New Zealand	103 (0.7%)	42 (0.5%)	2:27
Italy	98 (0.6%)	67 (0.8%)	1:27
Algeria	88 (0.6%)	43 (0.5%)	2:02
Ireland	79 (0.5%)	34 (0.4%)	2:19
Iraq	76 (0.5%)	39 (0.5%)	1:56
Turkey	75 (0.5%)	45 (0.6%)	1:40
Hong Kong	70 (0.5%)	39 (0.5%)	1:47
Brazil	69 (0.4%)	34 (0.4%)	2:01
South Korea	68 (0.4%)	49 (0.6%)	1:23

3.4. Dissemination – *Please provide a list of **past** and **future** scholarly activities (e.g., publications, presentations, invited talks, etc.) in which you or anyone from your team have or intend to disseminate the outcomes of this project.*

Barnes, S. J., Chandra, J. (June 19, 2014). Chalkboard animations for Psyc 304. *Flexible Learning Open House, University of British Columbia*. Vancouver, Canada.

Barnes, S. J. (July 25, 2015). Chalkboard Animations for Behavioural Neuroscience. *Vancouver International Conference on the Teaching of Psychology.* Vancouver, Canada.

Barsen, S., & Barnes, S. J. (October 18, 2015). Animating Hebb's three postulates. *Society for Neuroscience 45th Annual Meeting*, Chicago, USA.

4. TEACHING PRACTICES – *Please indicate if **your** teaching practices or those of **others** have changed as a result of your project. If so, in what ways? Do you see these changes as sustainable over time? Why or why not?*

In my course, PSYC 304, I have used the learning modules in their entirety for two sections of the course since the completion of this project. Students complete the learning modules on their own, and then we discuss and dig deeper into the issues raised in those videos in class. This has allowed for better student understanding of biological concepts in a population of students that doesn't necessarily have any background in biology.

The success of the chalkboard-based stop-motion animations I produced inspired my publisher, Pearson Education, to commission the production of 18 stop-motion animations (9 of which are now complete, and 3 of which are in various stages of post-production) for the forthcoming text, *Biopsychology 10th Edition*, for which I am an author.

In my course, PSYC 304, I used Poll Everywhere (https://www.polleverywhere.com/) as a learning tool for the last two sections of the course. At first, I used the live question capabilities of Poll Everywhere (i.e., questions from students would appear on my slides as I was presenting them), but I found that this was too distracting for me and the students. Moreover, sometimes inappropriate comments would appear on the screen. If this were to be re-implemented in the future, it would require the use of a TA in class to moderate the questions and comments, and to answer questions as they come up. Instead, I have come to use Poll Everywhere as a class polling tool—usually only in the first half of the course when students are struggling with the biological nature of the course materials and I am need of an online assessment of student understanding of the ideas being presented in class.

However, during the last section of my course (i.e., summer 2015) I realized that Poll Everywhere poses an accessibility issue to students who do not have smart phones (because I teach my course at night I often have seniors enrolled in my course who in many cases do not own a smart phone). Accordingly, in future sections of the course, I plan to resort to the use of iClickers in place of Poll Everywhere—even though there is a cost associated with student use of these devices (unlike Poll Everywhere), every student has a fair chance of participating in the in-class polls and questions if they so desire.

Many other instructors, both at UBC and at other institutions have taken up use of the videos I produced, but not necessarily the learning modules. Most use the videos in class to support their lectures or other activities. For example, Sunita Chowrira, the director of the combined major in science and senior instructor in the Department of Biology has required the use of some of those videos in all of the sections of BIOL 112 and BIOL 200 courses that she oversees. In future, she plans on including some of them in the course website that is common to all sections, and will assign it as required course material.

The success of the videos produced as part of this TLEF project have led to a second small TLEF project application that was just recently funded. In collaboration with Sunita Chowrira from Biology, we received funding ($22k) for a TLEF grant entitled 'Stop-motion Animations as Learning Objects for Flexible Learning in

Biology and Psychology Courses' which will make use of chalkboard-based stop-motion animations as 'Learning Objects' in supporting the existing 'Learning Path' model of the Flexible Learning Initiative in Biology (BioFlex) project. The primary objectives of this project are to create and investigate the effectiveness of narrated stop-motion animations (using the technique I developed) as Learning Objects for flexible learning in introductory biology (i.e., BIOL 112, 200, and 201) and behavioural neuroscience (i.e., PSYC 304, 360) courses. Specifically, Sunita and myself will produce ten stop-motion animations that deal with biological topics that students struggle with and/or are difficult to teach using traditional instructional methods.

In general, I believe the videos have been the greatest success of this project. The development of the technique that I use to produce these videos has also been a very positive outcome as it has led to the commissioning of additional videos for a textbook and the success of a recent Small TLEF grant application.

5. **PROJECT SUSTAINMENT** - *Please describe the sustainment strategy for the project components. How will this be sustained and potentially expanded (e.g., over the next five years). What challenges do you foresee for achieving the expected long-term impacts listed above?*

As mentioned in the previous section, the success of the chalkboard-based stop-motion animations has led to another successful TLEF application that will see the production of additional videos that will add to the collection of potential videos that can be used by instructors. I believe that, ultimately, it is the production of the videos as learning objects which matters the most, as any instructor can embed the videos in their Connect shell for their course or on their personal course website. Accordingly, from the standpoint of the videos at least, I believe this project will be self-sustaining.

Appendix 1: Psyc 304 Learning Modules – Exit Survey

1. Which of the learning modules was your favourite?
    a. Divisions of the Nervous System
    b. Epigenetic Mechanisms
    c. Postsynaptic Potentials
    d. Resting Membrane Potential
    e. Summation of Postsynaptic Potentials
    f. Transgenerational Epigenetics

2. Which learning module did you find the most useful for understanding difficult concepts? (or ask them to rank them?)
    a. Divisions of the Nervous System
    b. Epigenetic Mechanisms
    c. Postsynaptic Potentials
    d. Resting Membrane Potential
    e. Summation of Postsynaptic Potentials
    f. Transgenerational Epigenetics

3. Which learning module did you find the least useful for understanding difficult concepts?
    a. Divisions of the Nervous System
    b. Epigenetic Mechanisms
    c. Postsynaptic Potentials
    d. Resting Membrane Potential
    e. Summation of Postsynaptic Potentials
    f. Transgenerational Epigenetics

4. Did you find the learning modules easy to understand?
    a. Yes.
    b. No.
    c. For some concepts, but not for others.

5. Did you find it helpful to have both the learning modules and textbook for understanding difficult concepts?
    a. Yes.
    b. No.
    c. Undecided.

6. Did you find the learning modules more helpful for learning difficult concepts than the textbook?
    a. Yes.
    b. No.
    c. For some concepts, but not for others.
    d. Undecided.

7. Did you find any of the learning modules confusing? (select all that apply)
    a. Divisions of the Nervous System
    b. Epigenetic Mechanisms
    c. Postsynaptic Potentials
    d. Resting Membrane Potential
    e. Summation of Postsynaptic Potentials
    f. Transgenerational Epigenetics

8. In preparation for exams, how many times did you view each learning module (on average)?
    a. Once
    b. 2-3 times
    c. 5-7 times
    d. More than 10 times

9. Are there any other learning modules you would like to see?