CS6460: A Study on Student Engagement and Learning Outcomes in Online Learning

Cleo Zhang

yzhang3761@gatech.edu

1 PRESENTATION

Please click here to view the presentation video.

2 APPENDIX

The slides used for the presentation is attached here.

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CS6460 Final Presentation

A Study on Student Engagement and
Learning Outcomes in Online Learning

Cleo Zhang
yzhang3761@gmail.com
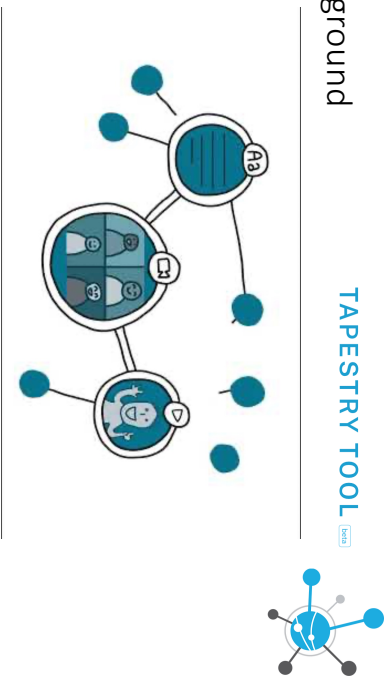

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Overview

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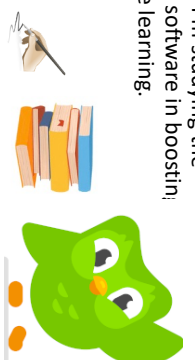**3**

Background

TAPESTRY TOOL beta

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Intro

My involvement with Tapestry sparked my interest in
the EdTech field.

In the CS6460 Research track, I'm studying the
important role of educational software in boosting
student engagement in online learning.

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Methodology - Activity Design

Project Overview

As a part of the CS660 Research track, I am undertaking a research endeavour to investigate the pivotal role of educational software in fostering student engagement within online learning. My research will investigate how technology can effectively stimulate students' curiosity and intrinsic motivation, ultimately leading to increased engagement and improved learning outcomes to what extent.

To participate, below are what you need to know:

- Platform: Duolingo
- Duration: October 16th - December 1st, 2023
- Communication: Emails + Ed Discussion
- Target Participants: 20 or more
- Learning focus: a new language not in your native language system!
  - For instance, if your mother tongue is Chinese, I might recommend delving into Portuguese. If Spanish is your native language, then Japanese could be an exciting challenge.

What you need to do

- Ideally, commit 30 minutes of learning daily. (No worries!) I will fire off daily email notifications for the first two weeks!)
- Send me weekly feedback about your learning state. Did you spend half an hour a day studying last week? Did you find it interesting to learn a new language? Did you feel confident about what you will learn after two months? And so on.
- By December 1st, 2023, let me know your overall feeling about the process.

How to participate

Give this post a thumbs up and leave your emails below! (Please share your native language with me!) By the end of the week, I'll send heartfelt greeting emails to all who participate. If you haven't already, install Duolingo, as we'll kick off our language-learning journey next Monday!
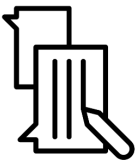

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Methodology – Experiment Design

- Controlled Experiments
- 18 Participants in total
- Goal: Student Engagement and Learning Outcomes in Online Learning context.
- Approach: Participants were randomly grouped into experimental and control groups

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Methodology - Data Collection

What I Collected:
- Participants' weekly feedback
- their final thoughts on the whole learning experience

How I Collected:
- Send reminder every Friday
- Receive Feedback via emails

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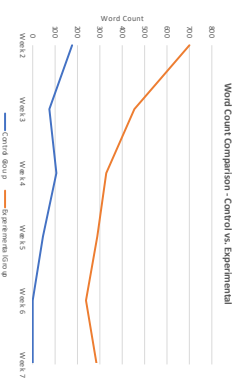# Methodology – Data Analysis Methods

Quantitatively Analysis

Qualitative Analysis

For analysis purposes, I will primarily use quantitative and qualitative analysis, as well as a combination of the two.

Data Analysis - Student Engagement 1

Word Count Comparison - Control vs. Experimental
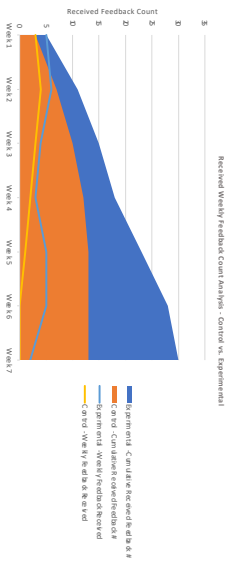

— Control Group — Experimental Group

This Double Line Chart shows the total number of words fed back by participants in the Experimental and Control groups.

It is clear that the experimental group sent feedback with more text each week than the control group, implying the participants who used Duolingo to learn the new language were more during the learning process than those who used the traditional method.

Data Analysis - Student Engagement 2

Received Weekly Feedback Count Analysis - Control vs. Experimental

Received Feedback Count

— Experimental - Cumulative Received Feedback #
— Control - Cumulative Received Feedback #
— Experimental - Weekly Feedback Received
— Control - Weekly Feedback Received

This Area-Line Combined Chart shows the cumulative amount of feedback from the experimental group has a steeper and more steady growth curve than the control one, which means that participants who used Duolingo had more stable learning behaviours and engagement levels throughout the learning activity, while the control group's engagement was decreasing.

Data Analysis – Learning Process

Word Cloud Generated for Duolingo Learning Experience

Word Cloud Generated for the Traditional Learning Experience

- The keyword "learning" appears more often in the feedback from the control group
- Descriptive words such as "challenged" and "struggled" appeared more often in the control group than in the experimental group
- From the participants' feedback, it seems that the two groups of participants have a different focus on learning languages through different learning approaches

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Data Analysis – Learning Outcomes Evaluation

Since I have not received any feedback from the control group participants in the final week and infeasibility of online language testing for both groups, the outcomes are evaluated through existing research and previous quantitative analysis.

Richardson and Swan (2003) and Garrison and Vaughan's (2008)'s research supports the positive correlation between learning engagement and final outcomes.

Since analysis has shown that the experimental group using Duolingo had a higher engagement level compared to the control group, the experimental group is supposed to have better outcomes in learning the new language than the control group.

Conclusion

Learning Engagement:
- Duolingo users consistently displayed higher feedback and word counts, indicating sustained engagement.
- Cumulative feedback for Duolingo users exhibited a steady growth curve, contrasting with declining engagement in the control group.

Learning Process:
- Duolingo users emphasized sensory experiences.
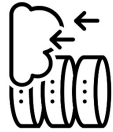- Control group focused on vocabulary and grammar.

Learning Outcomes:
The Experimental Group is expected to have better learning outcomes than the control Group

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Discussion – Critique

The data collected is limited regarding the time frame and number of participants, resulting in a Limited Scope for Generalization and Sampling Bias.

Participants are learning different languages, which have different learning curves – hard to assess participants' learning behaviors under the same standard.

Mechanical intervention by the researcher and the external makes the data hardly reflect reality

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Discussion – Future Work

The impact of the researcher's intervention on the study participants, regarding the data collection and the analysis results - Findings in this track help researchers revisit their experimentation flow in educational technology to obtain more reliable results.

Implicit assessment of online learning outcomes - Research on implicit assessment of online learning outcomes can benefit educational technology by providing nuanced insights into learners' subconscious knowledge retention and skill acquisition.

Effects of repetitive behaviours on learning - it is meaningful to discuss how the form and frequency of repetitive behaviours affect learners' learning status and outcomes.

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THE END

If you have any questions, please email me at
yzhang3761@gmail.com

Thanks for your time!

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