**Experiment PowerPoint Transcript**

# Slide One

This Power Point offers an overview of the research project entitled, “The Impact of Closed Caption Use on Learning Outcomes in Fully Online Classrooms.” This research was conducted by Dr. Katie Linder through the Oregon State University Ecampus Research Unit and was supported through the DETA Research Center thanks to a FIPSE grant from the U.S. Department of Education.

# Slide Two

The first section of this presentation will provide background into the DETA grant.

# Slide Three

The DETA Research Center’s goal is to conduct research on distance education – including online, blended, hybrid, and flipped courses and programs – to better understand the effectiveness of educational interventions across institutions. Competency-based distance education is also an instructional mode of interest that is examined as part of the cross-institutional research efforts and a competitive preference in the FIPSE grant.

The DETA Research Center developed the DETA Research Toolkit

* + to develop research models guiding the rigor of studies developed from an interdisciplinary lens and
  + to provide standardized research designs, variables and measures, shared definitions, and instrumentation,

The DETA Research Center supported several institutions in collecting data as part of this effort through subgrant awards.

# Slide Four

Through this research, the DETA Research Center wants to identify key factors that are impacting our desired outcomes for distance education, including access, learning effectiveness, instructional effectiveness, and satisfaction. In particular, the findings will lead the DETA Research Center to identify effective use practices at the instructional and institutional levels.

Instructional practices, such as content, assessment, interactivity, and learner support influencing student success, are being identified to improve desired outcomes. Also, institutional practices in diffusing different instructional approaches and student support mechanisms for these instructional approaches are being examined.

Some of these practices being researched include close captioned video (like the project that will be described here), student created video, adaptive learning, competency-based education, and academic success coaches.

# Slide Five

Currently, DETA has 9 institutional partners.

# Slide Six

This next section will share a little more about Oregon State University.

Oregon State University, founded in 1868, is a land grant institution located in Corvallis, Oregon. OSU is one of only two land grant universities in the United States to also hold sea grant, space grant, and sun grant designations. Oregon State University is classified as a research institution by the Carnegie Foundation and has also earned the Carnegie Community Engagement classification. OSU houses 11 colleges, 15 Agricultural Experiment Stations, 35 county Extension offices, the Hatfield Marine Sciences Center in Newport and OSU-Cascades in Bend. The university has a presence in every one of Oregon’s 36 counties.

Enrolling approximately 29,000 students (with 22% students of color and 11% international students) from all 50 states and more than 100 countries, OSU has nationally recognized programs in areas such as conservation biology, agricultural sciences, nuclear engineering, forestry, fisheries and wildlife management, community health, pharmacy and zoology. OSU students can choose from more than 200 undergraduate and more than 80 graduate degree programs, including over 40 online degrees offered through Oregon State Ecampus.

# Slide Seven

Regarding distance education enrollments at OSU, it is important to note that Oregon State has been creating distance education opportunities since 1998. Ecampus, which offers over 1000 credit courses in more than 90 subjects, served more than 19,000 students in 2015-16. In partnership with 10 OSU colleges and over 600 faculty members, Ecampus currently offers 21 undergraduate degree programs, 24 undergraduate minors, and 25 graduate programs.

# Since 2002, more than 3,000 Ecampus students have earned an Oregon State degree online.

# Slide Eight

We define enrollments at our Ecampus in two main categories: students who only take distance courses and students who take a combination of distance and on campus courses. Approximately 40% of students in Ecampus courses are distance students who take 100% of their courses online. The remaining 60% are located at one of our campuses and take courses both online and face-to-face.

OSU Ecampus students are diverse. Distance students who enroll with Ecampus are from all 50 states and nearly 40 countries. Approximately 52% of OSU’s distance students are women and 25% of distance students live in Oregon. Of all Ecampus students, including distance and campus-based, 4% are veterans, 21% are racial minorities, and 42% are over the age of 24.

# Slide Nine

# Distance education at Oregon State University is primarily online and asynchronous. While there are a few programs that are exceptions and operate on a hybrid model, the vast majority of our courses and programs are fully online and asynchronous, to better meet the needs of distance students.

# Slide Ten

A rigorous and funded course development process is used for quality assurance. Individual courses are proposed by academic units for development and delivery via Ecampus. Once accepted, a two-term development process begins. An instructional designer is assigned to partner with the faculty course developers, and the development of the online course is a partnership between the two, with the Ecampus instructional designer bringing expertise in online pedagogy and educational technology, and the faculty member bringing discipline specific knowledge and teaching experience that may or may not include prior experience teaching online.

The instructional designer pulls other Ecampus staff members into the development as needed to assist with factors such as media development and copyright permissions. Media development includes 3-D animation, videography, custom learning objects, voice-over lectures in several formats, and virtual and augmented reality.

# Slide Eleven

The training process begins with the faculty member participating in a six-week online course development workshop. Offered every term and introducing fundamentals of online course design and facilitation, the main project of the workshop is to produce a complete unit or module for the online course in development. The instructional designer is a co-facilitator of the workshop, so the primary Instructional Designer: Faculty Member relationship is maintained.

A full complement of professional development opportunities is available, and instructors of online courses are indeed expected to complete ongoing training. Other trainings offered include an advanced Redeveloping an Online Course Workshop, a facilitation workshop called Actively Engaging Students in Online Courses, and a self-paced Teaching an Online Course training. Topical one-time trainings are offered routinely in topics relating to academic technologies (such as the learning management system, plagiarism prevention tools) and relating to perennial challenges in facilitating online courses (such as managing discussion boards and group projects). Trainings are offered in multiple modalities, including fully online and asynchronous, webinars, and face-to-face. Ecampus also hosts an annual one-day conference about online teaching called the Faculty Forum. Approximately 200-250 faculty, advisors, and administrators attend each year.

# Slide Twelve

Each online course development is unique, with designs and learning materials created to suit the discipline and the learning outcomes for the course. Enrollment caps are also taken into account in the course design; a course with 25 students has different design needs as compared to one with 200.

Most courses are organized in weekly modules. Content presentation varies widely and can include readings, voice-over screen lectures, custom video from the field or of the instructor speaking with discipline or industry experts, interactive tutorials, open educational resources, and animated or virtual reality simulations. In some courses, students are asked to research and report back for content presentation and sharing.

Discussion forums are used in virtually all online courses in a myriad of ways. Many are full class discussions, but there are also many small group discussions, peer review discussions, and discussions used as work areas or presentation spaces.

Assessments are both formative and summative. Faculty course developers are encouraged to grade early and often in online courses. Assessments may include exams, papers, projects, presentations, homework assignments, lab reports, field trip observations, and reflective writing. Exams may or may not be proctored.

# Slide Thirteen

The pedagogical model used most often is the social-constructivist model, with the instructor as a guide and facilitator, guiding students to build on prior learning, to engage in active learning experiences and to practice reflection, and to apply knowledge to the real world.

Some courses use a cognitive-behaviorist pedagogical model, following Gagne’s nine events of instruction as a framework. The instructor’s role here is to provide a framework in selecting course materials and designing assignments, in providing formative feedback, and finally, summative assessment.

A few courses use a connectivist pedagogy, with instructors guiding students through the creation of artifacts and learning objects, such as websites or books. Here, the instructor’s role is more collaborative in nature, sharing responsibility for learning and creating content with students.

# Slide Fourteen

Ecampus subscribes to Quality Matters, a nonprofit organization that publishes research-based design standards for online and hybrid courses. Quality Matters also offers certification through a rigorous peer review process including at least one reviewer from an external institution.

All instructional designers complete several QM trainings and participate in ongoing training as needed, such as when the standards are updated to reflect the most current research (which is approximately every two years).

Ecampus uses a template that meets approximately half of the 40+ QM design standards. Some of these are met by the inclusion of standard information about learner services offered by the university and Ecampus, such as disability services and tutoring.

Instructional designers work with faculty in the development of the course to meet most or all of the remaining standards in the development process. (Some standards are independent of content and are met the same way in all courses; others relating to the alignment of outcomes, assessments, and course materials are specific to the course content and learning materials.)

Instructors can opt to have their course QM certified once it has been taught at least once and is considered stable in terms of its design. Certifications are good for five years or until more than 15% of the course is changed, whichever is first.

Other quality standards are spelled out in two rubrics, Ecampus Essentials and Best Practices in Online Education. “Ecampus Essentials” spells out the bare minimum requirements for online courses; these standards must be in place for the course development to be funded. The Best Practices document expands on these standards.

# Slide Fifteen

A high level overview of the standards is the following:

* Course designs should demonstrate alignment between learning outcomes, formative and summative assessments, learning activities, and course materials.
* Courses should be designed in a student-centered navigation (usually weekly or unit-by-unit modules).
* Course materials should be designed and produced for an online audience. (We don’t record campus-based lectures to post online, preferring instead to design lectures for the online medium, and for online students.)
* Courses should allow ample opportunity for three forms of learner engagement throughout the term:
  + Student/content, where the student has an opportunity for active learning, not just reading and viewing content.
  + Student/student, where students have the opportunity to be part of learning communities, such as group projects, paired problem solving, peer review, and online class discussions and
  + Student/instructor, where the instructor guides the learning, shares expertise beyond what the course text provides, and provides formative and summative feedback for learners.
* Course materials should be posted in an accessible format (for example, with documents designed to work with screenreaders, captions for video content, and alt text for images).
* Ecampus also offers a facilitation rubric to help instructors and academic units conduct peer reviews and teaching evaluations for online courses.

# Slide Sixteen

Currently OSU Ecampus captions new media as it is developed.  This can be for new or refreshed courses, Open Educational Resources, or marketing materials.  OSU’s Disability Access Services department handles copyrighted media and older media upon an accommodation request.  Once media is developed, Ecampus student workers pull the media to caption and then an Ecampus staff member adds the caption file to the media.

We started adding captions about 2 years ago, focusing on newly created media and courses up for Quality Matters review. Currently of the 9227 known media items, 2757 are captioned and 928 are in progress.  5541 are not captioned, but these are older media where courses may be due for updating soon.  Our Disability Access Services office will caption these if request comes in before updating.

# Slide Seventeen

The next section will provide more details about our study.

# Slide Eighteen

The research questions guiding this study are based on an original question posed by DETA that was developed by participants present at the DETA National Summit in 2015 at the ELI Annual Meeting. This original question was “What are the different design components that impact student learning?”

# Slide Nineteen

Based on this question, two additional research questions and four hypotheses were developed. The first research question and hypothesis is: To what extent do video closed captions help students learn in fully online environments? We hypothesized that students in fully online environments who use video closed captions will demonstrate greater learning than students working in fully online environments who use video that does not incorporate closed captions.

# Slide Twenty

The second research question is: To what extent are student sub-groups differentially impacted by video closed caption use? The hypotheses associated with this question were

* + ESL learners who use video and closed captions in fully online environments will demonstrate greater learning than ESL learners who do not use video closed captions in fully online environments.
  + Students with disabilities (SWD) who use video and closed captions in fully online environments will demonstrate greater learning than SWD who do not use video or closed captions in fully online environments.

# Slide Twenty-One

A final hypothesis for this research question is:

* + Adult learners who use video and closed captions in fully online environments will demonstrate greater learning than adult learners who do not use video closed captions in fully online environments.

# Slide Twenty-Two

We utilized the distance education research toolkit developed by the National Research Center for Distance Education and Technological Advancements (DETA) to guide the development of research plans for this study.

The DETA Center seeks to identify and evaluate effective course and institutional practices in online learning for underrepresented learners.

# Slide Twenty-Three

In this experimental study, a convenience population of 60 students in a 300-level biology course section were asked to consent to this study.

Of the original 60 student sample, 26 students consented to be included in the study. Of those consenting, three left the course, leaving 23 participants.

\*Notably, the small sample size of this study was a challenge, particularly for sub-group analysis. Additional data is currently being collected to increase the sample size for this data and aid in additional sub-group analyses.

# Slide Twenty-Four

Using the DETA Toolkit, which provided a list of variables and definitions, key variables were selected to help answer the research questions for this study.

Variables measured included quiz grades associated with the target videos, grade on final assessment of the learning objectives from all ten videos, overall course grade, and course completion. The following learner characteristic variables were also gathered: GPA, gender, ESL status, disability/impairment status, year in school, under 25/25 or over, income status, first-generation status, and racial/ethnic minority status. A pre-course survey targeting learner characteristics was administered to determine the extent of baseline differences between the groups.

# Slide Twenty-Five

The sixty students in the course targeted for this study were randomly assigned into one of two groups at the beginning of the term. A pre-course survey targeting learner characteristics was administered to determine the extent of baseline differences between the groups. At ten times during the term, each student group viewed a short video related to particular learning objectives for the course. Each group viewed each video in either the *captioned* condition or the *un-captioned* condition. Students who view the *captioned* condition for the first video then viewed the *un-captioned* condition for the second video, and vice-versa, alternating for all ten videos. Following each video, students were asked to take a short quiz and, at the end of the term, a final assessment of all of the learning objectives from all ten videos was conducted in order to measure longer-term retention. Mann-Whitney *U* tests were conducted to determine the statistical significance of learning differences between the captioned and uncaptioned groups.

# Slide Twenty- Six

This next section will discuss the results of this study.

# Slide Twenty-Seven

In this study, no statistically significant (*p*>.05) differences existed in baseline characteristics between the groups for the group as a whole. We also had enough data to perform sub-group analyses on two groups, so we measured for the sub-groups of adult learners & students of first-generation status and no difference existed within these groups.

# Slide Twenty-Eight

Regarding differences in learning outcomes, for the groups as a whole and for the adult learner and first-generation status subgroups, there were no statistically significant (*p*>.05) differences in any of the following: quiz grades, grades on the final assessment of all learning objectives, or overall course grades.

# Slide Twenty-Nine

In this section, I will describe recommendations based on this study.

# Slide Thirty

Given the small sample of this study, additional research is needed to learn more about whether the use of closed captions impacts learning outcomes for different groups of students, in different learning environments, and with different forms of closed captioning.

Although this study found no statistically significant difference, other research suggests that closed captions are an important component for some students learning.

For more information, please see a second project funded by DETA and completed by the Ecampus Research Unit at Oregon State University called “Student Use and Perceptions of Closed Captions in the Fully Online Classroom” which provides additional data on the subject of closed caption use among college students.

# Slide Thirty-One

I would like to thank the National Research Center for Distance Education and Technological Advancements for their support of this research.