**Affordable Learning Georgia Textbook Transformation Grants**

**Final Report**

**Date: August 5, 2015**

**Grant Number: 83**

**Institution Name(s): Columbus State University**

**Team Members (Name, Title, Department, Institutions if different, and email address for each): Richard Stephens, Professor,** **stephens\_richard2@columbusstate.edu** **and Alin Stancu, Associate Professor,** **stancu\_alin1@columbusstate.edu****, Department of Mathematics and Philosophy, Columbus State University**

**Project Lead: Richard Stephens**

**Course Name(s) and Course Numbers: Introductory Statistics, STAT 1127**

**Semester Project Began: Spring 2015**

**Semester(s) of Implementation: Spring 2015 and Summer 2015**

**Average Number of Students Per Course Section: 24.5**

**Number of Course Sections Affected by Implementation: 4**

**Total Number of Students Affected by Implementation: 98**

**1. Narrative**

**During Spring 2015 at Columbus State University, three sections of STAT 1127 Introductory Statistics were taught by Dr. Stephens with no-cost textbook material developed from Collaborative Statistics, Illowsky and Dean, Connexions, Rice University. Two of these sections were taught using a semi-flipped format with 35% of the class time devoted to traditional lectures, 50% to helping the students with their assignments and 15% to reviewing and testing. One of these sections was an Honors section which was conducted as a flipped self-paced class which included additional in depth study and assignments beyond that of the regular sections.**

**Each of these classes were quite successful (See uploaded DATA). Students in the Honors section liked the no lecture format, while some students in the sections with regular lectures expressed a desire to have lectures each class meeting. We felt that the difference in attitudes towards utilization of class time was not solely due to the differences in the makeup of the classes, Honors vs. regular.**

**During the “Go Live” semester (Summer 2015), our belief was subjected to additional testing. Dr. Stephens was assigned to teach one section of regular STAT 1127 along with MAED 6505. These classes were held in a computer classroom. Each course required Webassign and utilized a flipped format, so students knew from the beginning that there would be no daily lectures. The STAT 1127 class used Collaborative Statistics, 2nd Edition and MAED 6505 used Introductory Statistics from OPENSTAX.**

**Webassign for these two courses cost $29.95 and $32.95, respectively. STAT 1127 covered the usual topics in that course and was assessed through weekly assignments and weekly exams. (See uploaded SYLLABUS) MAED 6505 was a graduate special topics course for Math Teachers that covered the entire OPENSTAX textbook through a sequence of lengthy self-paced assignments.**

**Collaborative Statistics is available at** <http://legacy.cnx.org/content/col10522/1.39/> **,** <http://legacy.cnx.org/content/col10522/1.40/> **and** <http://legacy.cnx.org/content/col10522/latest/>**. The condensed version prepared by Dr. Stephens is available in word format. We do not recommend any of these editions. We found the OPENSTAX Introductory Statistics to be a significant improvement.**

**Open Intro Statistics, 2nd edition, is available in PDF and LaTex at** [**https://www.openintro.org/stat/textbook.php?stat\_book=os**](https://www.openintro.org/stat/textbook.php?stat_book=os) **A colleague used this textbook in Spring 2015. Neither he nor his students were satisfied with the appropriateness of this material for our STAT 1127 course, thus we do not recommend this textbook.**

**The “Go Live” semester was so transformative that it led us to the recommendation that the OPENSTAX Introductory Statistics through Webassign be used for STAT 1127 courses. Even though Dr. Stephens has invested hundreds of hours over several semesters developing, field testing and improving his no-cost condensed version of Collaborative Statistics, we have concluded that the OPENSTAX Introductory Statistics with Webassign is far superior to all previous editions of the materials produced by Illowsky and Dean. In this case we are convinced that low-cost is better than no-cost. We believe that the increased interest, productivity and ability to learn on one’s own, shown by the students in STAT 1127, justifies the small cost of Webassign that supports this material. We have come to this conclusion after considering STAT 1127 student effort, performance and satisfaction with this material and delivery format. We also took into consideration the opinions of the experienced teachers in the MAED 6505 course. (See Quotes below)**

**2. Quotes**

**STAT 1127**

1. **What did you like about the textbook used in this course?**

**“Easy to access and had multiple examples and solutions to many of the different type of problems.”**

**“Very helpful. Plenty of details & examples.”**

**“Cost and access.”**

1. **What did you not like about the textbook used in this course?**

**“Nothing.”**

**“A bit wordy at times, but it was all for a good reason.”**

**“Difficult in finding it in the bookstore.”** (Note: This problem has been solved and in the future the students will have access to a printed copy through the bookstore.)

1. **What did you like about using Webassign in this course?**

**“That it had multiple attempts for each problem in the assignment.”**

**“Being able to “practice another version” on the homework assignments.”**

**“Ease of access and usability.”**

1. **What did you not like about using WebAssign in this course?**

**“Nothing.”**

**“None.”**

**“Functionality of enterface (sic).”**

1. **Which aspect(s) of the course contributed the most (or the least) to your educational experience?**

**“Textbook and instruction from the teacher.”**

**“The notes the system leaves under the correct answers. Works well w/ studying.”**

**“The instructor.”**

**MAED 6505**

1. **What did you like about the textbook used in this course?**

**“I liked that the text was in an electronic format. The ability to save the text for offline use, as well as the ability to search the text for various keywords, made it much easier to review various topics during study. Access to the text “on the go” via multiple devices made the option to study at various times and locations a reality, as I never found myself without the textbook. The text was well-written and easy to read.”**

**“The textbook was straightforward and provided numerous examples, which demonstrated various approaches to concepts. The textbook was easy to navigate and follow. The practice problems at the end of the chapter were beneficial.”**

**“This text book is informative and encountered in everyday life. Statistics can lend credibility to an argument. Using the text book “take control of your life." But what does this mean? Partly, it means being able to properly evaluate the data and claims that bombard you every day. If you cannot distinguish well from faulty reasoning, then you are vulnerable to manipulation and to decisions that are not in your best interest. Statistics provides tools that you need in order to react intelligently to information you hear or read. In this sense, statistics is one of the most important things that you can study.”**

1. **What did you not like about the textbook used in this course?**

**“Honesty, there was not much about the text that I did not like.”**

**“On the “Try It” sections, there were no solutions to check if I was doing the problem correctly. “**

**“This text book is good for introductory level but for higher level we need more informative.”**

1. **What did you like about using Webassign in this course?**

**“I appreciated the ability to have limited opportunities to revisit questions and refine answers. I also like the option on some questions to practice a similar question without penalty so that I could clarify my thinking and assess whether or not additional study and skill practice was necessary prior to answering the question for credit. Additionally, I liked the immediate feedback that was provided regarding all work, which is often difficult (if not impossible) in traditional classes which require the instructor time in which to grade paper-and-pencil responses.”**

**“It allowed to me work at my own pace, which was to complete the majority of assignments well in advance of the due date. It provided multiple opportunities to learn and provided examples to practice prior to the completion of the problem.”**

**“At a time we are thinking solving and interpreting the problem most of the information is available in text book, most questions in web-assign is from text book. The online questions are similar to textbook examples with minor differences in variable number or wordings. Each student have unique questions, and the grades are updated after due date “**

1. **What did you not like about using WebAssign in this course?**

**“Some errata in questions (however, this could be addressed during the scheduled seat-time with the instructor personally.)** **Occasionally, there would be questions in which the student needed to consider the type of response that was being requested. However, this is common in computer-graded responses, and I found it to be minimized by reviewing the “additional practice” problems to be sure that I was answering in the format that Webassign considered “correct.” It did a fairly good job at providing alternate forms for responses, especially if you carefully read the instructions in each question.”**

**“I have no dislikes about WebAssign.”**

**“I like web-assign it is truly self-directed learning we learn and we solve, no dislikes for me.”**

1. **Which aspect(s) of the course contributed the most (or the least) to your educational experience?**

**“I found that the option to self-pace the instruction was beneficial. I had the option to move as quickly as I wanted through the content, so I never felt as though I was dragging my feet. The deadlines provided ample time to complete the work assignments and prompted me to make sure to budget my study time appropriately to stay on track. The scheduled class time also provided me comfort and assurance knowing that additional help was available if needed as I worked through the course content.”**

**“Being able to work at my own pace and complete assignments quickly is how I prefer to work and this class afforded me the opportunity to do that. Webassign assignments did not punish students if they did not understand. It allowed several opportunities to continually work problems to achieve the correct solution and learn the proper process.”**

**“Technology plays a vital role in this course mostly we used graphing calculator for solving problems. This contributes the most in our educational experiences. And also it improves the abilities of reading summarizing identifying differentiating and understanding.”**

**3. Quantitative and Qualitative Measures**

**3a. Overall Measurements**

**Student Opinion of Materials in STAT 1127**

**Was the overall student opinion about the materials used in the course positive, neutral, or negative?**

Total number of students affected in this project (in the Go Live Semester): \_\_\_\_**11**\_\_\_\_\_\_

* Positive: \_\_\_**87.5**\_\_\_\_ % of \_\_\_**8**\_\_\_\_\_ number of respondents
* Neutral: \_\_\_**12.5**\_\_\_\_ % of \_\_\_\_**8**\_\_\_\_ number of respondents
* Negative: \_\_\_**0**\_\_\_\_ % of \_\_\_\_**8**\_\_\_\_ number of respondents

**Student Learning Outcomes and Grades in STAT 1127**

**Was the overall comparative impact on student performance in terms of learning outcomes and grades in the semester(s) of implementation over previous semesters positive, neutral, or negative?**

 Choose One:

* \_\_**x**\_ Positive: Higher performance outcomes measured over previous semester(s)
* \_\_\_ Neutral: Same performance outcomes over previous semester(s)
* \_\_\_ Negative: Lower performance outcomes over previous semester(s)

**Student Drop/Fail/Withdraw (DFW) Rates in STAT 1127**

**Was the overall comparative impact on Drop/Fail/Withdraw (DFW) rates in the semester(s) of implementation over previous semesters positive, neutral, or negative?**

**Drop/Fail/Withdraw Rate:**

\_\_\_**0**\_\_\_\_% of students, out of a total \_\_\_**11**\_\_\_\_ students affected, dropped/failed/withdrew from the course in the final semester of implementation.

Choose One:

* \_**X**\_\_ Positive: This is a lower percentage of students with D/F/W than previous semester(s)
* \_\_\_ Neutral: This is the same percentage of students with D/F/W than previous semester(s)
* \_\_\_ Negative: This is a higher percentage of students with D/F/W than previous semester(s)

**3b. Narrative**

**Grade distributions and Student Course Evaluations scores are provided. (See uploaded DATA) Sections of STAT 1127 utilizing OER material during Spring 2015 were compared with sections taught by the other faculty during the same semester. GPA’s for the two groups were almost the same. The DFW rate for the OER group was the same or better than that of the other group. Of note is the fact that there was no withdrawal (W) from the OER group during Spring or Summer. Also, with the utilization of Webassign during Summer 2015 the DFW rate was 0% and the GPA was 3.82. One co-factor that might have influenced this outcome is the fact that in general, Summer students tend to produce better results than that of students during the regular academic year. We view our results as positive and encouraging for the future.**

**Without common exams in STAT 1127, there is no statistical comparison available for student success in the course learning objectives across different groups.**

**The due date of this report occurs before Summer 2015 grades are final. So, grade distributions for other Summer STAT 1127 sections are not yet available. Likewise, Summer 2015 Student Course Evaluations are not available at this time.**

**4. Sustainability Plan**

**During Fall 2015, Dr. Stephens will teach two sections of STAT 1127 with a total of 98 students. He has adopted the Introductory Statistics from OPENSTAX and will offer incentives for utilizing Webassign with this text. The course will be delivered in a flipped format. The success rates of students who use Webassign and those who do not use Webassign will be compared. He anticipates a result that will prompt him to require that Webassign be used for his STAT 1127 course in all future terms.**

**5. Future Plans**

**Dr. Stephens has a substantial history of utilizing OER’s in a variety of courses at Columbus State University, but he has resisted using web based technologies and course delivery methods. This project along with the influence and expertise of Dr. Stancu have completely changed his thinking about these issues. For each future course taught, he will seek and compare appropriate OER’s and low-cost web based course materials such as older textbooks through Webassign.**

**6. Description of Photograph**

**(left-right) Dr. Alin Stancu, Webassign course design and latex expert; Dr. Richard Stephens, team lead and instructor of record.**