

# Introducing Screencasts to Sport and Exercise Undergraduate Students Conducting Statistical Analysis: *How Useful Are They Anyway?*

## 1. Background

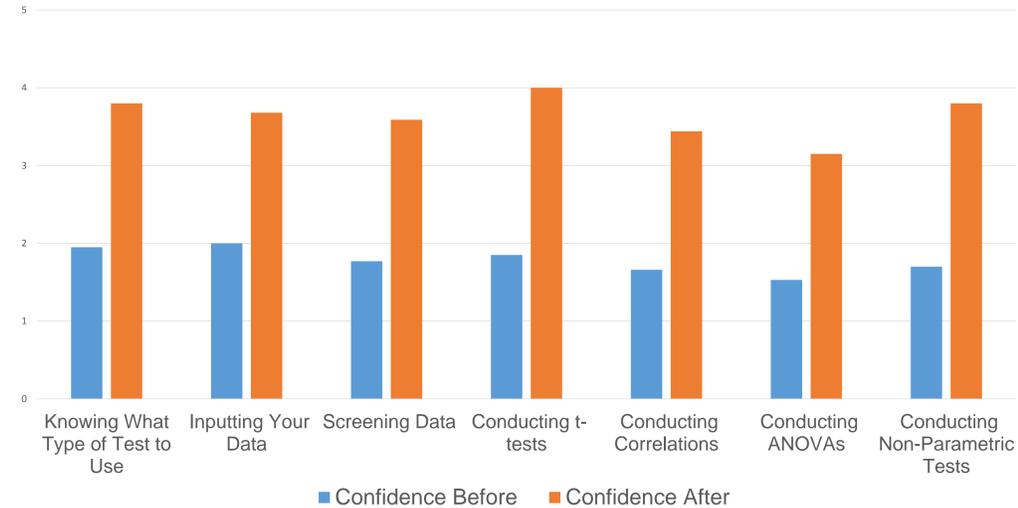
- Students 'expect to be able to access information on demand and arrive on campuses ready to engage with information in new ways'<sup>1</sup>.
- Screencasting is increasingly being implemented into teaching at higher education<sup>2</sup>. A screencast is a video recording of a computer screen including audio to explain what is happening on the screen.
- Screencasts have found to be a useful tool for students<sup>3</sup>, are beneficial to learning<sup>4</sup>, and increase perceived understanding<sup>5</sup> and student engagement<sup>6</sup>. However little is known about the impact of this pedagogical design on students' confidence.
- Sport and Exercise students are taught research methods at Level 5 through completion of a workbook. At Level 6, dissertation support sessions are often required as students struggle to retain information and lack confidence when analysing data.
- We hypothesized that screencasts may provide a reasonable solution to this problem.
- Aim:** To evaluate the usefulness and effectiveness of supplementary screencasts designed to improve student's confidence in conducting and analysing statistical data.

## 2. Methodology

- Seven screencasts guiding students on how to complete statistical analysis were developed.
- 28 undergraduate students participated (17 males, mean age 21.79).
- Level 6 students who attended dissertation support sessions were asked to engage with the screencasts if they were seeking help with data analysis and Level 5 students were asked to watch the screencasts during a research seminar session.
- Data was collected via a questionnaire which asked a series of questions about the usefulness and effectiveness of screencasts and if the addition of these improved students' confidence to carry out and analyse statistical tests. Data was then screened and analysed using a series of t-tests to determine any changes in confidence.



Student's Self-Reported Mean Confidence Before and After Watching Screencasts for Conducting Statistical Analysis



## 3. Results

- On a scale of 1 (extremely disagree) to 5 (extremely agree), students thought the screencasts were easy to follow (M = 4.21), extremely useful (M = 4.07) and effective (M = 4), provided good tips to aid understanding (M = 4.17), explained the content well (M = 4.25) helped students to better understand stats (M = 4.03), and preferred them over the workbook currently used in the module (M = 4.1).
- Paired samples t-tests showed there was a **significant difference** between student's confidence before and after watching the screencasts (Type of test, inputting data, screening data and conducting t-tests;  $p=.001$ ). T-tests were not conducted on all screencasts due to lack of student viewing.
- The majority of students suggested they would like to see the addition of screencasts used in teaching. However the majority of students recommended using the screencasts alongside the workbook currently used as opposed to using the screencasts alone.

## 4. Discussion

- Students perceptions of the screencasts were extremely positive in line with previous research<sup>3,5</sup>, and students' confidence in completing statistical analysis increased as a result.
  - Multimodal learning environments are environments that use two different modes to represent content knowledge: verbal and non-verbal<sup>7</sup>. According to modality of instructional design<sup>8</sup>, the most effective learning environments are those that combine both representations of knowledge; an advantage of screencasts.
  - Some students struggle with comprehending statistics. Therefore directing students' attention to essential information using the screencasts can be an effective way to keep students from focusing on extraneous material<sup>9</sup>.
  - Screencasts can provide learners with a student-centered and engaging learning experience.
- Limitations:**
- Students were asked to report their confidence pre and post viewing screencasts at the same time.
  - Impact of screencasts on student performance was not measured (e.g., assessment).

## 5. Implications for Practice

- By using innovative pedagogical tools students were more positive when engaging with the module content and were able to work more independently.
- The use of screencasts allowed the students to visualize the written instructions in the workbook they are recommended to refer to at Level 6; enhancing their learning experience and increasing their confidence when working through the module content.
- Students preferred the screencasts over the workbook currently used in the module, suggesting the addition of screencasts are warranted.
- Further research that objectively measures the impact of screencasts on student performance is recommended.



## References

M= Mean; <sup>1</sup>Ford, M.B., Burns, C.E., Mitch, N., & Gomez, M.M. (2012). The effectiveness of classroom capture technology. *Active learning in higher education*, 13(3), 191-201. <sup>2</sup>Lloyd, S.A. & Robertson, C.L. (2012). Screencast tutorials enhance student learning of statistics. *Teaching of Psychology*, 39(1), 67-71. <sup>3</sup>Green, K.R., Pinder-Grover, T., & Millunchick, J.M. (2012). Impact of screencast technology: connecting the perception of usefulness and the reality of performance. *Journal of Engineering Education*, 101(4), 717-737. <sup>4</sup>Evans, D.J. (2011). Using embryology screencasts: A useful addition to the student learning experience?. *Anatomical sciences education*, 4(2), 57-63. <sup>5</sup>Pinder-Grover, T., Green, K.R. & Millunchick, J.M. (2011). The efficacy of screencasts to address the diverse academic needs of students in a large lecture course. *Advances in Engineering Education*, 2(3), 1-28. <sup>6</sup>Snyder, C., Paska, L. M., & Besozzi, D. (2014). Cast from the Past: Using Screencasting in the Social Studies Classroom. *The Social Studies*, 105(6), 310-314. <sup>7</sup>Paivio, A. (1986). *Mental representations: A dual-coding approach*. New York: Oxford Univ Press. <sup>8</sup>Moreno, R., & Mayer, R. E. (1999). Cognitive principles of multimedia learning: The role of modality and contiguity. *Journal of educational psychology*, 91(2), 358. <sup>9</sup>Mayer, R.E., & Moreno, R. (2003). Nine ways to reduce cognitive load in multimedia learning. *Educational psychologist*, 38(1), 43-52.

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