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Overcoming Installation Procrastination: The SPSS Early Adopter Program

Scott A. Wowra, Ph.D.
Capella University

Christina Etchison, Ph.D.
Capella University

Brianna McCartney, Ph.D.
Capella University

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Abstract

Software installation is an early barrier to success for graduate students in our online statistics class. To help them overcome this potential barrier, our instructional team created the SPSS Early Adopter Program (SEAP). The SEAP gamified the installation task with a discussion badge and bonus point; these external motivators encouraged students to avoid procrastinating on their SPSS installation. To document student experiences with the SEAP, we conducted a nonexperimental, descriptive study of 475 students enrolled in an online statistics course. Data collection and analysis consisted of descriptive statistics of the SEAP completion rate and a reflexive thematic analysis of students' spontaneous reactions to the installation process. Results showed that 205 of 475 students (43%) completed the SEAP challenge. In their unsolicited responses, 14 SEAP completers (7%) spontaneously expressed confusion and uncertainty; we coded this as a theme of academic vulnerability. Another 27 SEAP completers (13%) spontaneously expressed comments like, "I finally figured it out!" We coded these responses as a theme of academic resilience. For academically resilient students, the SPSS Early Adopter Program transformed a success barrier into a rewarding challenge.

Overcoming Installation Procrastination: The SPSS Early Adopter Program

Learning basic statistics is an essential skill for graduate students in the social sciences. Statistics courses can be quite challenging for graduate learners in both brick-and-mortar programs and online programs. However, online students may experience additional barriers to success due to the unfamiliarity of the online learning environment and the need to unlearn previous habits from their face-to-face learning experiences (Abdous, 2019). As a result, students who take an online statistics course may not perform as well as those who enroll in a traditional face-to-face course (Lu & Lemonde, 2013).

It is common for students to experience anxiety in courses that are not directly related to their area of study, such as research methods (Rapp-McCall & Anyikwa, 2016) and statistics (Hedges, 2017). In fact, statistics courses have been found to induce the most anxiety among students (Barcelona et al., 2023; Chew & Dillon, 2014). This type of anxiety, known as "statistics anxiety," is characterized by negative emotions when faced with statistics in personal and educational contexts (Cook & Catanzaro, 2023). Graduate students often attribute their statistics anxiety to a lack of math skills, concerns over exams, and the mandatory nature of the course (Tutkun, 2019). Additionally, social science statistics courses typically require proficiency with statistical software like SPSS, which may further exacerbate anxiety for students who are less confident with computers (Tutkun, 2019).

Many students who experience statistics anxiety and feel like they lack technical skills may put off installing the software required for the course until the last minute, a behavior that our instructional team has dubbed "installation procrastination." While this phenomenon has not

been studied in the context of statistics courses, research suggests that there is a correlation between statistics anxiety and procrastination in such classes (Lalande et al., 2019; Onwuegbuzie, 2004).

As instructors teaching an online statistics course, we have noticed a concerning trend among some of our students. Roughly 5% of learners have reached out to us in the first two weeks of the semester expressing frustration and concerns over software installation. What's more, some of these emails are received just hours before the deadline of the first statistics assignment. Most of the emails describe issues with SPSS installation, causing a common pattern of procrastination and frustration followed by an extension request. This early technological barrier poses a risk to the learners' retention and engagement, potentially leading to early withdrawal or low performance. Regrettably, we have observed some students who have dropped the course before even attempting to learn statistics.

To address the additional challenges of online learning, including a lack of humanization and social connection, prior research has established the importance of increasing engagement, understanding, and peer support (Czerkawski & Schmidt, 2017; Li et al., 2022). As part of our instructional approach, our team hosts weekly live group video conferences to foster these connections. Our students actively support and encourage one another by sharing tips and tricks on how to effectively navigate and resolve potential computer issues and other technical issues. We also host an "SPSS Install Party" during the first week of class, which allows students and instructors to share helpful resources and troubleshoot any installation issues. According to student evaluations, over 30% of learners reported that these group sessions helped alleviate feelings of anxiety, isolation, or frustration. It is clear that real-time interactions that promote

peer and instructor support play a crucial role in boosting engagement and alleviating anxiety in our course.

Statistics Anxiety and Gamification

Despite these efforts, we have noticed that some students continue to struggle with software installation, which we believe leads to frustration and potential disengagement from the course. To address this issue, we developed a new installation strategy with a gamification element called the "SPSS Early Adopter Program" (SEAP). This program was designed to improve students' initial experiences with installing statistical analysis software and reduce anxiety and procrastination.

Research has shown that small challenges can support anxious students and build intrinsic motivation (Dunn & Dunn, 2014; Paechter et al., 2017). By implementing SEAP, we hoped to provide students with a fun and engaging way to learn how to install SPSS software. The SEAP included small skill challenges to help students build their confidence in navigating technical issues, which we designed to help them avoid last-minute panic emails. In other words, we viewed the SEAP as a means of building students' academic self-efficacy in our course. Academic self-efficacy is defined as a student's belief that they can fulfill academic tasks (Hayat et al., 2020). The idea was that a SEAP completer would receive a boost of confidence in their belief that they could meet the challenges of a statistics course that would help them maintain their motivation and engagement when the actual statistics assignments were assigned later in class.

In addition to differences in academic self-efficacy, we believe that procrastination plays a significant role in statistics anxiety (e.g., Trassi et al., 2022), and implementing SEAP would give students a sense of ownership over their learning experience. Our goal was to promote

engagement and alleviate feelings of frustration, isolation, and anxiety for our students. Through the use of gamification and peer support, we hoped to create a positive and supportive learning environment that encouraged students to succeed.

Gamification involves integrating game design elements like badges and achievements into non-game contexts such as education (Rodrigues, et al., 2019). Previous studies have shown the positive outcomes of gamification in online learning, including increased student interest (Pechenkina et al., 2017), and engagement (Ahmad et al., 2021; Yin, 2018;). With these findings in mind, the purpose of this project was to explore whether gamification would support our students' efforts to install SPSS earlier in the course.

Our research question was, "What happens when online graduate students enrolled in a statistics course are challenged with a 'software installation game' that rewards successful installation by a deadline?" The goal of SEAP was to help students overcome their first major hurdle—SPSS installation—and increase their confidence before they attempted their actual statistics homework.

The SPSS Early Adopter Program

In the Fall of 2020, we designed the SPSS Early Adopter Program (SEAP) using Doodly and Yellowdig. Doodly is a software program that allows instructors to create engaging videos with graphics, music, and animations. Yellowdig is a course discussion platform that looks and feels like a traditional social media forum. Learners post videos and memes, react to one another's posts with emojis, and generally engage in a less formal discussion of statistics. Although we could not find any published studies exploring the relationship between Yellowdig activity and statistics anxiety, we believe that the flexibility and informal nature of Yellowdig may alleviate some students' apprehensions about studying statistics.

Another feature of Yellowdig includes a gamification element called "badging." An administrator can award a student with a "rare but attainable" accolade (Miron, 2023, para. 1) such as an "Insightful!" badge for submitting a particularly perceptive post to the discussion board. We decided to use badging as an extrinsic motivator for SPSS installation. In the context of gamification, an extrinsic motivator is defined as a source outside of the individual that initiates goal-oriented activity, such as rewards, money, accolades, or social recognition (Wei, 2023). We hoped that if we could create a Yellowdig thread that asked learners to visually share a successful installation of SPSS for a badge, not only would they find that experience personally motivating, but other students in Yellowdig would see those posts and be inspired to do the same.

Initial SEAP Advertisement

The first step was creating a brief, 1-minute and 6-second Doodly video to advertise the SPSS Early Adopter Program. The first Doodly slide announced the SEAP title with the "writing hand" that included some engaging, upbeat music to create a relaxed but energetic tone.

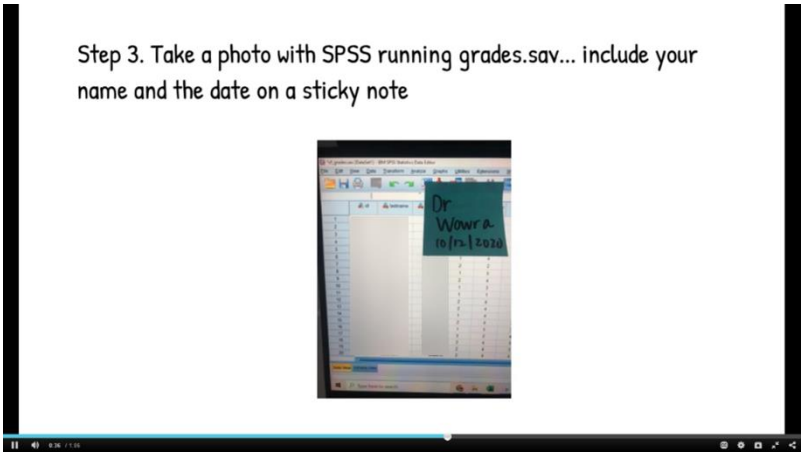
In the second Doodly slide, we provided a reason—other than extra credit—that students should consider for completing the SEAP. The slide mentioned that it would help them "avoid stress in Week 2…"

The third Doodly slide illustrated the first step of SEAP completion: successfully installing SPSS. Many online students assume that, when they have installed SPSS, they have everything they need to complete an SPSS assignment. They sometimes do not understand that SPSS requires a .sav data file, so we created Doodly slides to reinforce the second step of SEAP completion. This step required them to open the course .sav file in SPSS.

To maintain the integrity of the SEAP challenge shown in Figure 1 below, a Doodly slide showed students how to provide a photo of SPSS running the .sav file with a sticky note on the computer screen displaying their name and date of installation. The next Doodly slide encouraged students to upload their picture to the "SPSS Early Adopter" Yellowdig thread that would appear on Sunday of Week 1. The final Doodly slides showed students the badge and reward for early adoption of SPSS and encouraged them to reach out to the instructional team if they had questions.

Figure 1

SEAP Instructions



SEAP in Yellowdig

The Doodly advertisement was sent to all students as a link in an email encouraging them to post their picture in Yellowdig for credit. The advertisement was played 610 times (309 times on the first day and fewer views on subsequent days); 235 plays resulted in a 100% play-through. On Sunday of Week 1, in Yellowdig we created a post called "SPSS Early Adopter Program" and pinned it to the top of the thread. We created a SEAP logo and set a calendar deadline for "early" adoption, which was the second Wednesday of class. We asked students to press "Reply"

and not “Create” so that all the images (i.e., screenshots of completed installation) would be housed in one thread. We also created the “SPSS Early Adopter” topic, which allowed learners to search for the thread at a later date.

The final step was creating the SEAP badge. The badge added one bonus point to a student’s weekly Discussion grade when it was applied to their post. Given that students needed 1,000 points by the end of the course to earn a 100% Discussion grade, we considered 1 bonus point to be a relatively minor incentive for completion of the SEAP challenge.

Figure 2

SEAP Yellowdig Post with a Badge

SEAP Results

Data collection. In the Fall of 2020, 205 out of 475 students (43%) enrolled in an online statistics course completed the SEAP by the deadline. Students provided evidence by responding to the SPSS Early Adopter Program thread on YellowDig. Students earned a badge by merely

posting their proof of completion as a screenshot. A majority of the SEAP completers posted the completion image without comment (n = 124; 60%). However, 81 SEAP completers (40%) added unsolicited, spontaneous comments like, "I figured out how to download and activate my SPSS program. Yay!!" We obtained an informed consent waiver from our Institutional Review Board to retrieve these YellowDig responses for analysis.

Data analysis. After the semester ended, our third author de-identified the YellowDig data and shared it as a password-protected Excel spreadsheet with the first author and second author. We then independently analyzed the responses using reflexive thematic analysis (TA; Braun & Clarke, 2020). TA is a method for analyzing qualitative data that is useful in a constructivist paradigm that searches for latent, deeper themes from initial codes (Kiger & Varpio, 2020). We coded responses based on our understanding of the literature showing that procrastination and self-efficacy are important mediators of statistics anxiety (Trassi et al., 2022).

Thematic analysis consists of a six-step process, and the first step is familiarization with the data (Kiger & Varpio, 2020). Prior to initial coding, we read and reread all 81 responses to better understand the entire data set. The goal was to obtain a holistic understanding of student experiences.

The second step of TA is the generation of initial codes (Kiger & Varpio, 2020). Forty-two responses were reiterations of the SEAP such as "SPSS Early Adopter" or "SPSS Installation," and these comments were coded as "completed." We used the code "accomplishment" for statements like, "I did it!" or "Done!" that included exclamation points. Another initial code emerged from the word "finally," such as "Finally figured it out" and "Finally… I was driving myself crazy!" These responses were coded as "perseverance."

Additional codes that reflected positive experiences included "relief," such as "Well, that wasn't so bad!" and "gratitude," like, "Thank you!!!"

Two students specifically used the word "struggling" in their response, which became a code, and two other students wrote "hope I did this right," which was coded as "uncertainty." A variety of other responses along these lines were coded as "confusion" over whether the student had installed SPSS or completed the SEAP.

After independently coding all 81 responses, we then set out to group codes into themes, which is the third step in reflexive thematic analysis (Braun & Clarke, 2020). We met to complete the third step and ultimately worked together on the fourth step (reviewing themes) and the fifth step of defining and naming themes (Kiger & Varpio, 2020). During step 3, we categorized all of our initial codes into three thematic "buckets" along a continuum ranging from positive experiences, neutral experiences, and negative experiences. Step four of TA involves making sure that there are sufficient codes to support a theme and that the codes within a theme are coherent. Step five of TA involves defining and naming the themes (Kiger & Varpio, 2020). These themes and supporting codes are shown in Table 1 below.

Table 1. *Themes with Supporting Codes*

Theme	Code	Number of occurrences
Neutral		**164**
	Statement of completion	42
	Picture of completion (no code)	122
Academic resiliency		**27**
	Accomplishment	12
	Perseverance	9
	Relief	4
	Gratitude	2
Academic vulnerability		**14**
	Confusion	9
	Uncertainty	3
	Struggling	2

Neutral experiences. Most students' posts suggested a neutral experience (*n* = 164; 80%). They posted either a picture of completion without comment (*n* = 122), which was not coded, or they posted a picture with a brief statement reiterating the name of the program such as "#spssearlyadopter" or "SPSS Early Adopter" (*n* = 42).

Academic resiliency. Twenty-seven of the SEAP completers (13%) expressed a positive experience with the SEAP. Most students in this category (*n* = 12) expressed a sense of accomplishment (e.g., "I did it!"). Another common code within this theme was perseverance (*n* = 9) with six students explicitly using the word "finally" to communicate overcoming a challenge. Two students expressed gratitude, and another two students expressed pride over completing the SEAP. Finally, four students expressed relief. Some of the positive responses were:

> I DID IT! I hope this is correct because this wasn't the easiest task however I really want to earn that badge (and the extra point…??). Shout out to everyone in the comments for the tips because I didn't find the video too helpful
>
> So, no lie, I was terrified of this program, but the more I play with it… the more I kind of like it…
>
> I FINALLY FIGURED IT OUT!
>
> After a long day of panicking and more #statsstress I finally figured it out. So not ready for what's next but cheers ??

Reflecting on the codes in the positive experiences set, we believe the theme relates to academic resilience, which is significantly predicted by differences in academic self-efficacy (e.g., Cassidy, 2015). "Resilient students… maintain high motivational achievement and performance even when faced with stressful events and conditions that place them at risk of poor

performance" (Cassidy, 2015, p. 2). A student who is academically resilient sees situations as challenges and will keep trying to achieve their goals despite obstacles and setbacks. Statements like, "I finally figured it out!" represent academic resiliency.

Academic vulnerability. In contrast to students who had completed the SEAP assignment, fourteen SEAP completers (7%) expressed ongoing difficulties with SPSS installation. Students in this category were confused about the installation process (n = 9), uncertain that they had completed the SEAP (n = 3), and/or explicitly mentioned that they were "struggling" (n = 2). Some examples of negative comments were:

> I did it!?? I tried multiple times this is the Best pic I could get?? I hope I can survive this class I really need a tutor?? anyone else struggling?
>
> I am really struggling to download SPSS on my computer. Can you please give me any more tips that I can have to download this? I have been trying for [a] day and it is still giving me issues.
>
> I was unable to find the "grades.sav" data. This is what comes up right when I open the SPSS program, so I'm not sure what else I need to do to find the "grades" data."

The codes of confusion, uncertainty, and struggling reflect a negative experience related to SPSS installation. In short, we believe these students were experiencing a state of low academic self-efficacy in our course. That is, they were struggling with assignment directions and expressing uncertainty that they could complete the assigned tasks for class, which we then labeled "academic vulnerability."

In conclusion, the data showed that four out of five SEAP completers (80%) completed the challenge as a means of earning an additional Discussion point, and it is unclear how these students felt about the challenge. Another 13% of SEAP completers expressed positive

experiences associated with academic resilience. These students persisted in the face of an early challenge, and future research may show whether a gamified installation challenge does lead to changes in students' perceptions of academic self-efficacy and academic resilience. Finally, 7% of the SEAP completers expressed a variety of negative emotional experiences and thoughts that were labeled as a state of academic vulnerability. These students could be targeted with additional support efforts to help them overcome this temporary state of vulnerability as well as guiding them towards higher levels of academic self-efficacy.

Conclusion

Installation procrastination may be an early barrier to success for some graduate students enrolled in an online statistics course. Specifically, some graduate students express statistics anxiety as concerns over their computer skills (Tutkun, 2019). These concerns may lead to behavioral delays over statistical software installation, which we have referred to as "installation procrastination." To address this possibility, the SPSS Early Adopter Program incorporated game-like design elements that encouraged learners to avoid installation procrastination.

Yellowdig activity showed that the SEAP was ostensibly a success, although we did not track installation rates in previous courses to serve as a comparison. Future research could compare a class with a SEAP to a class without a SEAP. We are also curious to know if levels of statistics anxiety, procrastination, academic self-efficacy, and academic resiliency are at all affected by early adoption programs. We also assume that an early adoption program would work with other statistical software programs such as R and Jamovi as well as qualitative software programs like NVivo and Atlas.ti.

There were additional benefits to the SEAP program. In addition to SEAP completers who posted for the bonus point, the public SEAP thread helped other learners who could not get

SPSS installed. Noncompleters mentioned their challenges and received additional support from classmates and instructors. SEAP completers also congratulated one another and appeared to feel more at ease about going into their first SPSS assignment. For at least 13% of the SEAP completers, the possible frustration of installing SPSS appeared to be transformed by gamification elements into a fun challenge. However, future experimental research is necessary to show a causal connection between installation gamification and statistics anxiety.

For our part, the creation of the SEAP was a fun, creative exercise for our instructional team. The SEAP fused a variety of technologies, including Doodly and Yellowdig, to create an early experience for learners that was not too labor intensive. Including an innovative program like the SPSS Early Adopter Program showed learners that we cared about their success.

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