

# **Use of marketing and gamification to promote participation in extracurricular experiences focused on transferable skill development**

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## **Abstract**

The DegreePlus program at Western Carolina University is a newly developed initiative to help students develop transferable skills, including professionalism, cultural responsiveness, leadership and teamwork, by attendance at specific extracurricular events. The program was first implemented in the 2017-2018 academic year as a pilot with Honors College students, conditionally admitted students and students in specific living-learning communities. Participation by these student groups was encouraged through targeted marketing, transition courses, required attendance at DegreePlus events, and gamification. This research addresses how these methods impacted student participation. We concluded that requiring early participation influenced some students to continue their involvement in DegreePlus, and gamification helped students get interested in the program, but students also recognized the intrinsic value of the program and planned to continue their involvement. Targeted marketing helped to increase awareness and understanding of the program and how it works.

## Introduction

### *Background and motivation*

Western Carolina University (WCU) is a regional, comprehensive university located in rural western North Carolina. WCU is a member of the University of North Carolina system and is accredited by the Southern Association of Colleges and Schools Commission on Colleges (SACSCOC). Undergraduate student enrollment in fall 2018 was 10,027. As part of the recent SACSCOC reaffirmation of accreditation, WCU has created and implemented an institutional program to develop transferable skills in high achieving and at risk students. The program utilizes an applied learning approach to bridge classroom and extracurricular experiences and aims to provide students with the tools necessary to understand and articulate their learning in and out of the classroom. WCU named the new effort DegreePlus to emphasize that the program will augment students' academic experience with a meaningful extracurricular focus.

Rather than simply mandate student participation, DegreePlus provides a gamified mechanism for acquiring skills in the areas of professionalism, cultural responsiveness, leadership and teamwork. Students participate in extracurricular activities that emphasize learning outcomes associated with these skills and earn points and prizes as they progress through three levels of mastery: (1) experience and exposure, (2) reflection and articulation, and (3) integration and application. Preliminary impacts of the program on student development have recently been published (Huffman, Tallant, & Young, 2019).

One of the goals of DegreePlus is to increase participation in these types of activities or events on campus. Several strategies were used to promote participation, including the gamification of the program. Extensive research has shown that there is a connection between gamification and student motivation (Buckley & Doyle, 2016; Lister, 2015; Muntean, 2011). Another strength of the gamification of learning is a connected learning environment in which "a young person is able to pursue a personal interest or passion with the support of friends and caring adults, and is in turn able to link this learning and interest to academic achievement, career success or civic engagement" (Ito et al., 2013, p. 4).

Although some postsecondary institutions use gamification, such as digital badges, to help students gain skills that aren't self-evident on an academic transcript (Gibson, Ostashewski, Flintoff, Grant, & Knight, 2015; Fain, 2016; Casilli & Hickey, 2016), many implementations focus on social networking (de-Marcos, Domínguez, Saenz-de-Navarrete, & Pagés, 2014), e-learning (Osipov, Nikulchev, Volinsky, & Prasikova, 2015) or computer game (Hamari et al., 2016) contexts. A recent review by Dichev and Dicheva (2017) suggests that in higher education, many reports of gamification are tied to individual classroom activities or projects associated with a single course. The current study shares both qualitative and quantitative findings about student motivation as it relates to gamification of DegreePlus, an institutionalized, applied learning program that crosses disciplinary boundaries. Our study also examines gamification of extracurricular activities in higher education rather than more commonly studied curricular gamification.

In addition to gamification of DegreePlus, participation in the program was promoted using a marketing strategy that included presentation of the program at orientation sessions for students and parents, targeted marketing materials (brochures, ground stickers, signage, etc.) in specific locations, such as residence halls where participants live, emphasis of the program in university studies (USI) courses, and mandatory attendance of events. The goal of this study is to examine what (or if any) of these strategies, including gamification, may have successfully incentivized student participation in DegreePlus.

### *Gamification of DegreePlus*

The DegreePlus program is a tiered program and, mimicking Bloom's taxonomy (Bloom, 1956), is designed to scaffold student learning from experience to reflection to application. In Level 1, students are required to attend extracurricular events or activities, designated as DegreePlus events, aimed at exposing students to a specific transferable skill. Students earn points for attending DegreePlus events. Students complete Level 1 once they have earned at least five points in a particular skill area.

Level 2 requires students to attend DegreePlus Day, a central event on campus designed for students to celebrate their progress through the program. Students attend a formal (free) dinner with a keynote speaker and receive rewards, prizes and giveaways. Most importantly they

reflect on the impact of their DegreePlus experiences. Trained faculty and staff mentors meet with students in small groups to lead them in a reflection session. After the session, students write a reflection that is evaluated by the mentor.

Finally, once a student has successfully completed a reflection, the student is promoted to Level 3. In Level 3, students submit a proposal for a capstone experience in which the skill is implemented. This experience can be curricular or extracurricular and must show integration and application of the skill or skills they are demonstrating. Examples include a capstone in their academic discipline, an internship, a service-learning project, a study abroad experience, or other significant experience selected by the student as evidence of skill application. The student is invited back to DegreePlus Day the following year to share the capstone with students at Level 2. Level 3 presentations are evaluated by mentors. Both Level 2 and Level 3 artifacts (reflection and presentation) are assessed using a rubric that aligns with the student learning outcomes for each skill.

In many gamification models, the students' ability to track their progress is a central component (Dickey, 2005; Glover, 2013). Unfortunately, due to technical limitations, students were unable to independently monitor their progress during the pilot year. In most cases, students were periodically updated by email of their points/level status by DegreePlus administrators.

### *Pilot*

To test DegreePlus in its initial year (2017-2018) on a small scale, the program was piloted with a small population including (1) first time, first year undergraduates and transfer students in the Honors College, (2) first time, first year undergraduates in the Academic Success Program (ASP), which is a conditional admission program offered to students whose grades or standardized test scores indicate the potential for academic success but who can benefit from a structured college access program, and (3) first time, first year students enrolled in leadership-related living-learning communities (LEAD). The leadership team for each of the three pilot groups selected different approaches to the implementation of the DegreePlus, which included few, some or all of the promotional strategies identified above, with the exception of gamification, which was built into the program for all students. In ad-

dition to those strategies, two pilot groups required a minimum amount of attendance at DegreePlus events. The Honors College required attendance at a DegreePlus event and consistently marketed the program to new students during orientation sessions and throughout the fall semester, particularly in their university transition (USI) courses. ASP embedded DegreePlus as a requirement during their five-week pre-matriculation summer experience and, like the Honors College, required attendance at a selected fall event, requiring participation at a total of two events. Students in the fall leadership living-learning communities were encouraged through their USI courses to attend DegreePlus events, but were not required to participate.

DegreePlus leadership opted to pilot with the professionalism skill in the fall and, in the spring, cultural responsiveness activities were added. All events were open to the entire student population, so students outside the pilot group also attended DegreePlus events. As part of this study, these students were designated “non-pilot” students.

### **Methods**

Research suggests that focus groups are an effective way for developing programs to reach student participants (Morgan, 1996). This approach was used mid-way through the pilot year (Jan/Feb 2018) to gain an initial understanding of what motivated student participation in DegreePlus. In addition, a survey of participants toward the end of the academic year (April 2018) was used to more quantitatively assess students’ reasons for participating. This research was exempt by WCU’s institutional review board. All focus group participants and survey respondents were WCU students age 18 or older who volunteered to participate and gave consent to use their responses for research by either signing a consent form or giving permission via a survey question. Event participation data was provided by DegreePlus administrators as de-identified data. No demographic information about the participants was included except for whether they were part of one of the pilot groups or not.

### *Measurement of participation*

Attendance of all participants was tracked via student ID card swipe or student sign-in. Data was collected at each DegreePlus tagged event by DegreePlus administrators or program hosts. Attendance records for each DegreePlus tagged event were organized in Microsoft Excel for Mac (version 16.16.3) using a pivot table to determine the number of events each student attended in the fall semester, the spring semester, and throughout the pilot program. The participation data contained event attendance records for 354 students in the Honors College, 133 students in LEAD, and 179 students in ASP (a total of 666 pilot participants), and 2,170 students who were not in any of the three pilot groups (non-pilot). Using IBM SPSS (version 25), the count data was fit using the Generalized Estimating Equations with a Poisson log link (Proudfoot, Lin, Wang, & Tu, 2018) to examine the differences between participation in fall 2017 and spring 2018 and between the pilot groups and the non-pilot students.

### *Focus group*

The Associate Director of DegreePlus provided contact information for a subset of participants who had previously given consent to share their participation data. These students were classified into two separate groups: a low participation group, which included students who attended less than three DegreePlus events, and a high participation group, which included students who attended three or more DegreePlus events. These students were separately invited to participate in the focus group study so that each focus group would be aligned according to students' level of participation in the DegreePlus program. Five students participated in the low participation focus group and three participated in the high participation focus group.

Researchers developed eleven open-ended questions designed to lead a discussion about students' DegreePlus experiences. Seven questions were linked to how students learned about DegreePlus and what drove them to (or not to) participate:

- How did you first learn about DegreePlus?
- What do you know about DegreePlus?
- To what extent have you participated in DegreePlus?

- How was your involvement in DegreePlus encouraged? (What motivated/caused you to participate?)
- What prevented you from participating in DegreePlus?
- What might have encouraged you to participate in more DegreePlus activities?
- Would you have participated in DegreePlus without encouragement (points)?

Five focus group sessions were conducted during January and February 2018, each lasting 30-45 minutes. All but one session were audio recorded. On two occasions, only one student was present, but the same questions were used for one-on-one conversations as for group sessions. Sessions were moderated by 1-3 members of the research team, each taking notes. One researcher recorded verbatim and two recorded summarized notes. One researcher compiled all notes. All three researchers met and reviewed compiled notes and identified themes from responses.

### *Survey*

A list of all students who attended at least one DegreePlus event and any other students that were designated as pilot participants but did not attend any events was compiled by the Associate Director of DegreePlus. These students were invited by the research team via email to complete an electronic survey about their DegreePlus experience. There were 86 responses to the survey. One response was omitted because the respondent was under 18 years old, and 43 responses were omitted from the study because the student did not identify him/herself, so participation in the program could not be verified. Two additional responses were eliminated because a student completed the survey twice with conflicting responses. Of the remaining respondents, seven had not participated in the program, and only one student from each of the ASP and LEAD groups responded, so these responses were not included in the analysis of the program participation factors. Since the research aims to distinguish effective motivational practices, two respondents who were enrolled in both the Honors College and LEAD, and therefore likely received mixed marketing strategies, were discounted as well. A total of 29 responses were analyzed, 12 from non-pilot students and 17 from Honors College students. In comparisons of

pilot and non-pilot participation, the survey results rely only on Honors College students as the pilot group. We recognize that it would have been preferable to compare the responses of all of the pilot populations with the non-pilot group, as the Honors College population is not a representative sample of students. Such students are a highly motivated and curious population with a passion for learning (Achterberg, 2015). One would expect these students to recognize the value of a program like DegreePlus. This bias in the data, as well as the small sample size, limited our ability to draw generalizable conclusions.

The survey was comprised of eleven questions in both single and multiple answer multiple-choice format and Likert scale format. Survey questions that related to how students learned about the program and factors that influenced participation are presented in the results and discussion.

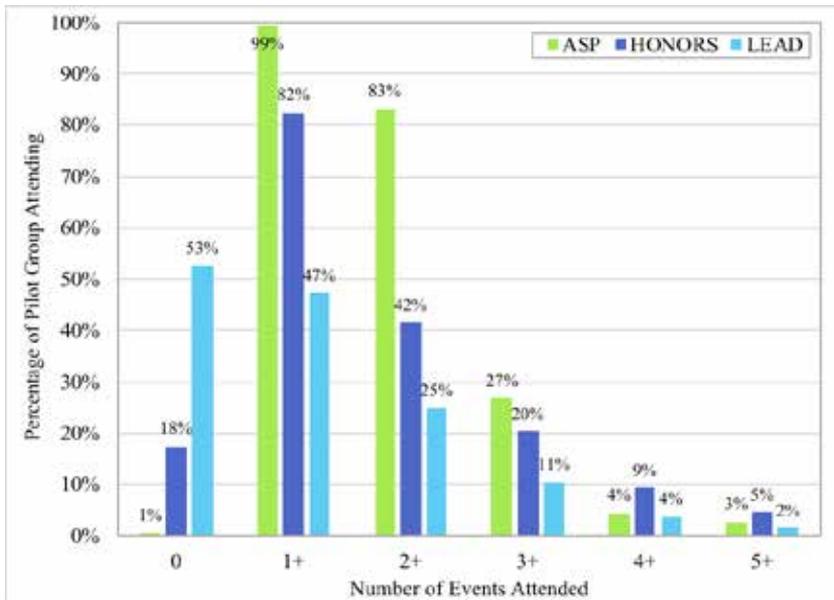
## **Results and discussion**

### *Trends in participation*

Participation in DegreePlus events by the Honors College students and the ASP students was the highest, which was expected given that these groups received focused marketing and were required to attend events. As shown in Figure 1, we observe that 82% of the Honors College students attended at least one event, and 83% of the ASP students attended at least two events, fulfilling the requirements of their respective programs. Almost half of the students in the LEAD program attended at least one event, which is remarkable considering the minimal direct marketing this group received. However most of the attendance occurred in the spring, which will be discussed later. Although attendance at more than the required events tapers for both Honors College students and ASP students, 27% of ASP students still attended at least three events and 42% of Honors College students attended at least two. This persistence suggests that a substantial number of students valued the program and continued to participate beyond the requirements of their respective programs.

Table 1 lists the average and median number of events attended for each pilot group and the non-pilot participants for fall 2017 and spring 2018. Likewise, Figure 2 shows the distribution of number of events attended by these groups. Overall, total pilot group participation drops

off in the spring relative to the fall semester. (See Figure 2.) This is consistent with a decrease in the average number of events attended for Honors and ASP students from fall to spring. In spring 2018, without the mandatory event participation, the average attendance of the Honors College students and ASP students dropped significantly from 1.01 (fall) to 0.66 (spring) and from 1.99 (fall) to 0.21 (spring), respectively. Both decreases are statistically significant ( $p < .001$ ). The higher fall attendance is most likely attributed to the mandatory event participation for Honors College and ASP students in that term. In contrast, the majority of LEAD and non-pilot students did not attend any DegreePlus events in the fall. (The average number of events was 0.08 and 0.26, respectively). This is likely because non-pilot students were not overly aware of the program and LEAD students were only encouraged, not required, to attend.

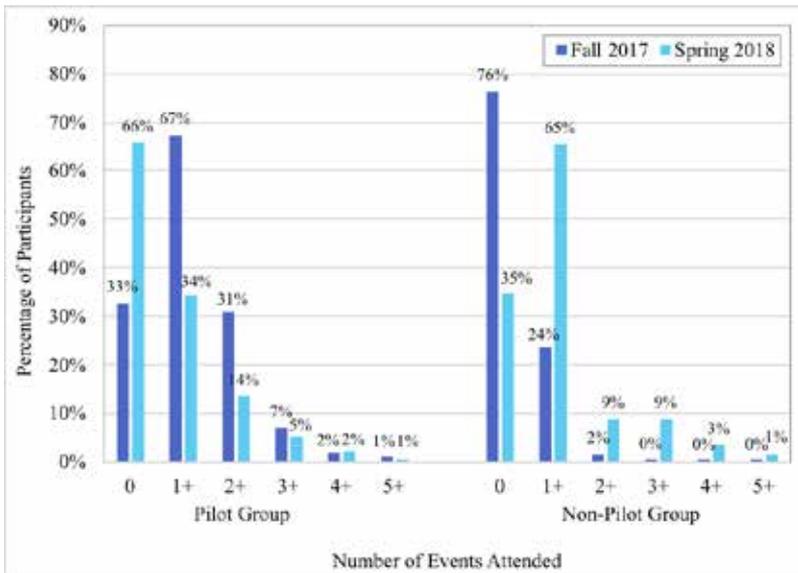


**Figure 1** Percentage of students in each pilot group attending a certain number of events (+ is “or more”) throughout the pilot year (2017-2018). For ASP, Honors and LEAD, N = 179, 354, and 133, respectively.

**Table 1** Average and median number of events attended by pilot and non-pilot groups for fall and spring. Statistical values are based on a Poisson regression model.

	N	Fall 2017			Spring 2018		
		Mean	Median	SD	Mean	Median	SD
ASP	179	1.99	2	0.793	0.21	0	0.516
Honors College	354	1.01	1	0.926	0.66	0	1.101
LEAD	133	0.08	0	0.303	0.80	0	1.138
Non-pilot	2,170	0.26	0	0.498	1.26	1	1.001

Although the combined pilot group attendance decreased from fall to spring, the average number of attended events increased for the LEAD pilot group from 0.08 to 0.8 while event attendance of the non-pilot students increased to more than one event at 1.26, a statistically significant increase in both cases ( $p < .001$ ). Despite the lack of mandatory attendance for Honors College and ASP students in spring, the average number of events attended for the total population (regardless of group, including non-pilot students) significantly ( $p = .002$ ) increased from fall (0.45) to spring (0.61). The increase in participation may be due to an increased number of events being offered in the spring (76 in the spring vs. 19 in the fall). In addition, events related to cultural responsiveness were added for spring. According to DegreePlus administrators, these events tended to have greater appeal to students than the events related to professionalism. One can speculate that the types of programs and events related to cultural responsiveness are seen as more immediately relevant and interesting to students than events related to professionalism.

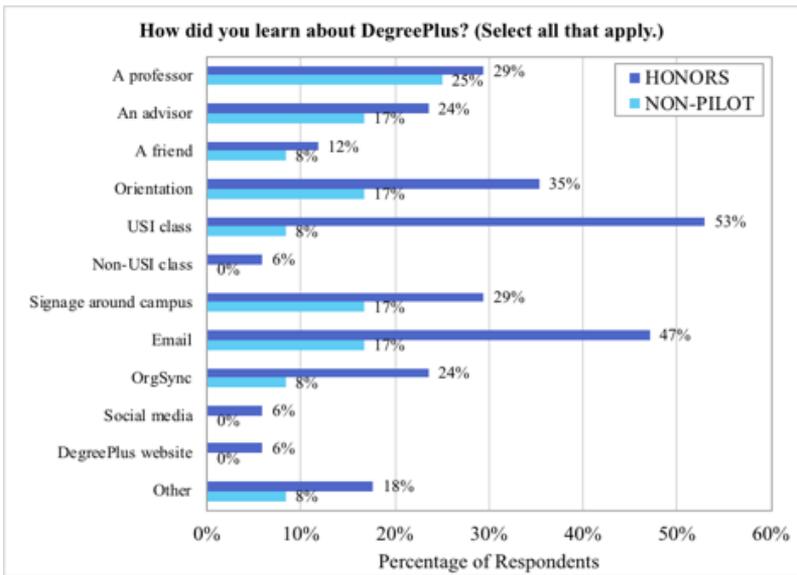


**Figure 2** Percentage of pilot (N = 666) and non-pilot (N = 2,170) groups attending a certain number of events (+ is “or more”) during fall and spring.

To investigate the effects of the various marketing strategies, we compared the relative attendance of individual pilot groups to the non-pilot group. In the fall, Honors College students were almost four times more likely to attend a DegreePlus event than the non-pilot group and ASP students were close to eight times more likely than those not in the pilot groups to attend an event ( $p < .001$ ). This was expected since Honors College and ASP students had required attendance. However, LEAD students had a less than one-third chance to attend an event compared to the non-pilot students ( $p < .001$ ), which was surprising since LEAD students were encouraged to participate, but the non-pilot students were not. In the spring, the non-pilot students were 1.9, 1.6, and 6.1 times more likely to attend an event than the Honors College, the LEAD, and the ASP groups, respectively ( $p < .001$ ). This suggests that external driving forces prompted attendance for non-pilot students, such as the increased number of events as a whole as well as the types of events.

### *Effectiveness of marketing strategies*

Our survey addressed how students learned about DegreePlus. Results for the non-pilot and Honors College pilot respondents are shown in Figure 3. For the non-pilot group, responses are fairly evenly distributed across the different methods, suggesting there was not a clear message sent through a single outlet. However, Honors College students, who received directed marketing, identified USI classes, email correspondence, orientation, and signage around campus as mechanisms that played a large role in informing them about the program. Since these were the primary modes of advertising for the pilot group, we were pleased to see that DegreePlus marketing was effective.



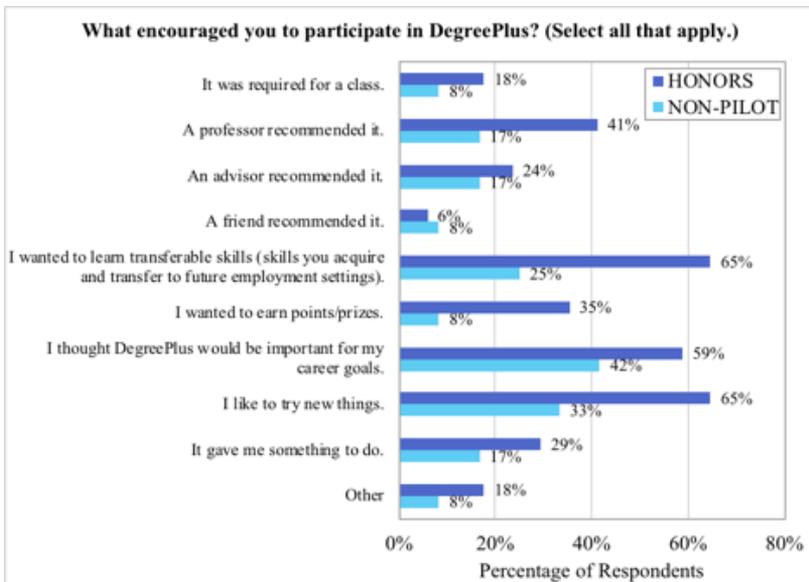
**Figure 3** Non-pilot (N = 12) and Honors College pilot (N = 17) perceptions of how they learned about the DegreePlus program.

Conversations with the focus groups indicated that flyers, posters, and sidewalk stickers created awareness for the program, but students who did not receive direct marketing found this method of marketing ineffective at conveying an understanding of the program. Students who had participated and received direct marketing seemed to have a better understanding of how the program worked, but only a few students

could describe the program clearly and accurately. As the program continues to develop, more consistent messaging and language will convey a clearer picture of DegreePlus and how it works.

*Motivation for participation*

The survey directly asked what drove students to participate in DegreePlus. Two questions, with results shown in Figures 4 and 5, examined motivation to participate and a third question probed the role of gamification in encouraging participation. Interestingly, for both non-pilot and Honors College pilot students, motivations are similar. As shown in Figure 4, participants like to try new things; they recognize the value of DegreePlus for their career goals and learning transferable skills; and they rely on recommendations from faculty.

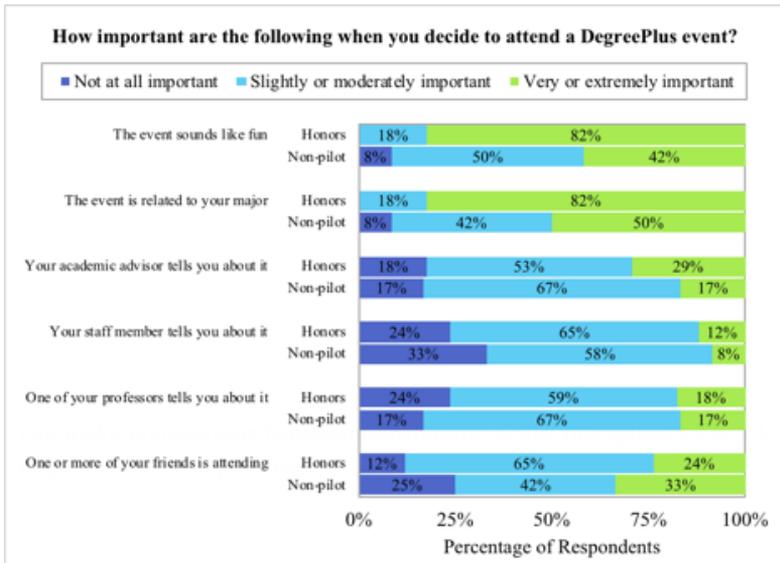


**Figure 4** Non-pilot (N = 12) and Honors College pilot (N = 17) perceptions of what encouraged their participation in the DegreePlus program.

In the focus group sessions, we learned that gamification was a driving force for students with high participation rates. It was less of a driving force for the low participation students, but this may be because they

didn't really understand how the program worked. A similar result from the survey is shown in Figure 4. Gamification ("I wanted to earn points/prizes") was a much bigger driving force for the pilot group (35% of respondents) than for the non-pilot group (8% of respondents). The non-pilot group and some of the low participating focus group members may not have received marketing that explained the gamification aspects of DegreePlus. This may account for the response to a survey question that asked, "Would you have participated in DegreePlus without incentives like points or prizes?" Fifty percent of the non-pilot population responded that they did not know that points or prizes could be earned by participating. Oddly, 29% of Honors College pilot participants were also unaware of the gamification aspect. Nonetheless, 41% of Honors College pilot students and 42% of non-pilot students responded that they would probably or definitely participate even without the gamification aspect. This suggests that the gamification may be an initial draw to participate, but as students come to understand the value of the program, they may participate for its intrinsic value.

Figure 5 shows how important certain aspects are for students deciding whether or not to attend an event. Responses are broken out by Honors College pilot participants and non-pilot participants as well as the percentage of respondents in each group that selected "not at all important," "slightly or moderately important," or "very or extremely important." We used multiple pairwise tests on this single data set to interpret whether certain aspects of an event were more important than another. As such, we used the Bonferroni adjustment to determine p-values to avoid Type I errors (Dunnett, 1955). Regardless of whether students were in the pilot group or not, how fun an event is perceived to be was a statistically more important factor in deciding to attend than whether a friend is attending ( $p = .008$ ) or recommendations from faculty ( $p = .001$ ), advisors ( $p = .019$ ) or staff ( $p < .001$ ). This resonates with what was learned in the focus groups. Students specifically indicated that they would participate more if events were interactive or hands-on. Another important consideration for students is whether or not the event is related to their major. This aspect was significantly more important than whether a friend is attending ( $p = .003$ ) or recommendations from university personnel ( $0 < p < .009$ ). DegreePlus is specifically designed to be non-disciplinary since the intended transferable skills are considered appropriate for all students, regardless of their major. However, students may be more inclined to participate if they



**Figure 5** Non-pilot (N = 12) and Honors College pilot (N = 17) perceptions of what impacts their decision to participate in the DegreePlus program. In this stacked bar chart, a larger colored segment indicates a greater percentage of responses in a particular importance category and vice versa.

Finally, participants were asked about how they envision their participation in the upcoming year. The vast majority of participants claimed their participation would be the same or higher. Fifty-nine percent of Honors College pilot respondents claimed their participation would remain the same, probably because their participation was already high compared to the non-pilot group. In contrast, 75% of the non-pilot group respondents claimed they would increase their participation, likely because their participation was initially low and the program was new to them.

**Conclusions and future directions**

DegreePlus was piloted with three distinct academic groups. Each group received different modes of marketing, but all were allowed to experience the gamification of the program. Their participation and motivation for being involved was examined and compared to a non-pilot group that received no direct marketing. We found that pilot

groups that were required to participate had high attendance rates, but that their attendance dropped after the requirement was filled. Students not required to participate had an increase in attendance, likely due to the addition of more DegreePlus events in the spring in a subject students found interesting, cultural responsiveness. Students in the pilot group picked up on the directed marketing strategies, and both pilot and non-pilot participants seem to attend for some of the same reasons: they like to try new things; they value the program's ability to teach transferable skills and help them meet their career goals; and because faculty promoted the program. Students are more likely to participate if the event sounds fun or it's related to their major. Lastly, students who understood the gamification aspects of the program were interested in earning points or prizes, but this was less important to students who did not comprehend how the program worked. Many participants, even in the pilot group, did not know that points or prizes could be earned. An identified challenge for gamification of institutionalized, extracurricular programs is how to convey the complexities of the "game" (points/levels/prizes) when the audience is not captive in a classroom.

These conclusions should be taken in light of limitations. Our study uses pilot data from a small sample, collected from a single institution. The small sample size made it difficult to identify any demographic differences in a largely homogenous sample. Therefore, we were unable to draw any conclusions about how demographics may influence students' participation. Additionally, many of the survey responses were from Honors College students, which may impose a bias when comparing results to responses of the non-pilot group. It will be important to explore the expectations and experience of ASP and LEAD students in future studies. Despite these limitations, our research contributes to the literature about motivation and gamification in higher education in both institution-wide and extracurricular contexts.

Future research should employ more rigorous research designs that examine the nuances of motivation to participate in extracurricular activities among various groups of students. For example, determining gender differences in motivation may be useful to design targeted marketing to specific groups. Also, other student populations, such as transfer students, underrepresented students, commuters and those with undeclared versus declared majors may require different, targeted marketing tactics. Future research should also examine the motivation

of faculty and staff to support DegreePlus. For the long-term sustainability of the program, motivation of faculty and staff to offer and align their applied learning experiences with DegreePlus learning outcomes is vital.

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### References

- Achterberg, C. (2005). What is an honors student? *Journal of the National Collegiate Honors Council*, 6(1), 75–84. Retrieved from <http://digitalcommons.unl.edu/nhcjournal/170>
- Bloom, B. S. (1956). *Taxonomy of Educational Objectives, Handbook I: The Cognitive Domain*. New York: David McKay Co., Inc.
- Buckley, P., & Doyle, E. (2016). Gamification and student motivation. *Interactive Learning Environments*, 24(6), 1162–1175. <https://doi.org/10.1080/10494820.2014.964263>
- Casilli, C., & Hickey, D. (2016). Transcending conventional credentialing and assessment paradigms with information-rich digital badges. *The Information Society*, 32(2), 117–129. <https://doi.org/10.1080/01972243.2016.1130500>
- de-Marcos, L., Domínguez, A., Saenz-de-Navarrete, J., & Pagés, C. (2014). An empirical study comparing gamification and social networking on e-learning. *Computers & Education*, 75, 82–91. <https://doi.org/10.1016/J.COMPEDU.2014.01.012>
- Dichev, C., & Dicheva, D. (2017). Gamifying education: what is known, what is believed and what remains uncertain: a critical review. *International Journal of Educational Technology in Higher Education*, 14(1), 9. <https://doi.org/10.1186/s41239-017-0042-5>
- Dickey, M. D. (2005). Engaging by design: How engagement strategies in popular computer and video games can inform instructional design. *Educational Technology Research and Development*, 53(2), 67–83. <https://doi.org/10.1007/BF02504866>
- Dunnnett, C. W. (1955). A multiple comparison procedure for comparing several treatments with a control. *Journal of the American Statistical Association*, 50(272), 1096–1121. <https://doi.org/10.1080/01621459.1955.10501294>
- Fain, P. (2016, August 9). Digital badging spreads as more colleges use vendors to create alternative credentials. *Inside Higher Ed*. Retrieved from <http://connectingcredentials.org/digital-badging-spreads-colleges-use-vendors-create-alternative-credentials/>
- Gibson, D., Ostaszewski, N., Flintoff, K., Grant, S., & Knight, E. (2015). Digital badges in education. *Education and Information Technologies*, 20(2), 403–410. <https://doi.org/10.1007/s10639-013-9291-7>
- Glover, I. (2013). Play As You Learn: Gamification as a Technique for Motivating Learners. In J. Herrington, A. Couros, & V. Irvine (Eds.), *World conference on educational multimedia, hypermedia and telecommunications* (pp. 1999–2008). Chesapeake, VA. AACE, <https://doi.org/10.1109/IOLTS.2008.53>

- Hamari, J., Shernoff, D. J., Rowe, E., Coller, B., Asbell-Clarke, J., & Edwards, T. (2016). Challenging games help students learn: An empirical study on engagement, flow and immersion in game-based learning. *Computers in Human Behavior, 54*, 170–179. <https://doi.org/10.1016/j.chb.2015.07.045>
- Huffman, C. L., Tallant, A. C., & Young, S. C. (2019). Preliminary impact of DegreePlus: An institutional program to provide transferable skill development through extra-curricular activities. A Practice Report. *Student Success, 10*(1), 131-139. <https://doi.org/10.5204/ssj.v10i1.1094>
- Ito, M., Gutiérrez, K., Livingstone, S., Penuel, B., Rhodes, J., Salen, K., ... Watkins, S. C. (2013). *Connected learning: An agenda for research and design*. Irvine, CA: Digital Media and Learning Research Hub.
- Lister, M. (2015). Gamification: The effect on student motivation and performance at the post-secondary level. *Issues and Trends in Educational Technology, 3*(2). [https://doi.org/10.2458/azu\\_itet\\_v3i2\\_Lister](https://doi.org/10.2458/azu_itet_v3i2_Lister)
- Morgan, D. L. (1996). Focus groups. *Annual Review of Sociology, 22*(1), 129–152. <https://doi.org/10.1146/annurev.soc.22.1.129>
- Muntean, C. I. (2011, October 28). *Raising engagement in e-learning through gamification*. Proceedings of the 6th International Conference on Virtual Learning, Cluj-Napoca, Romania. Retrieved from [http://icvl.eu/2011/disc/icvl/documente/pdf/met/ICVL\\_ModelsAndMethodologies\\_paper42.pdf](http://icvl.eu/2011/disc/icvl/documente/pdf/met/ICVL_ModelsAndMethodologies_paper42.pdf)
- Osipov, I. V., Nikulchev, E., Volinsky, A. A., & Prasikova, A. Y. (2015). Study of Gamification Effectiveness in Online e-Learning Systems. *International Journal of Advanced Computer Science and Applications, 6*(2), 71–77. <https://doi.org/10.14569/IJACSA.2015.060211>
- Proudfoot, J. A., Lin, T., Wang, B., & Tu, X. M. (2018). Tests for paired count outcomes. *General Psychiatry, 31*(1), 46-51. <https://doi.org/10.1136/gpsych-2018-100004>