

Hack Your Library: Engage Students in Information Literacy through a Technology-themed Competition

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Abstract

Hack Dibner is a library competition for engineering students focused on information literacy, technology, and user experience. The challenge statement was “To enhance user experience in the library through technology.” Students were allowed to participate as individuals or as teams, and were required to submit three deliverables throughout the semester: an initial concept, a written proposal, and a presentation. These deliverables required the students to perform a literature review to support their project ideas and to practice crafting and delivering effective presentations. To hold the students’ interest throughout the semester, the library scheduled five engagement activities. These ranged from librarian-hosted information literacy workshops to faculty research presentations. The written proposals and presentations were scored by a committee of judges to determine the contest winner. The success of the competition was evaluated through a focus group of student participants.

In this paper we present an overview of Hack Dibner, as well as a starter kit for other libraries. A timeline of the competition, marketing materials, and contest templates are presented to help librarians organize their own version of the contest.

Introduction

During the 2016-2017 school year Bern Dibner Library at the New York University (NYU) Tandon School of Engineering held Project Shhh!, a design competition. The competition focused on the noise and space problem specific to Bern Dibner Library and challenged students to find a solution. Although the competition was successful, it had limited appeal among the student population and could not be recreated in libraries lacking a noise problem. After the competition concluded, we (the librarians) conducted a focus group with the student contestants and learned which elements of the competition worked well and which needed to be revised. In this paper, we present a newly inspired library competition: Hack Dibner.

In designing Hack Dibner we had four specific goals in mind. (1) The competition needed to appeal to a large base of the student population, (2) create a triangle of engagement: student to library, library to faculty, and faculty to student, (3) be easily adaptable by other libraries, and (4) create opportunities to develop students’ information literacy skills. To achieve these goals, we started with a broad challenge statement, “To enhance user experience in the library through technology.” The challenge statement of Hack Dibner, which allowed for more avenues of entry than Project Shhh!, along with a well-planned marketing strategy, resulted in a 400% increase in registration from the previous competition. Students were allowed to participate as individuals or as teams, and were required to submit three deliverables throughout

the semester: an initial concept, a written proposal, and a presentation. These deliverables required the students to perform a literature review to support their project ideas and to practice crafting and delivering effective presentations. To hold the students' interest throughout the semester, we scheduled five engagement activities. These ranged from librarian-hosted information literacy workshops to faculty research presentations. The written proposals and presentations were scored by a committee of judges to determine the contest winner. The success of the competition was evaluated through surveys and a focus group of student participants.

With the success of Hack Dibner, we hope that other libraries will be inspired to host this competition as a way of introducing information literacy and research to engineering students. Our intent is to provide a starter kit for other libraries to host their own Hack [Your Library] competitions. A timeline of the competition, marketing materials, and suggested resources are presented to help librarians organize their own version of the contest. Also supplied are spreadsheet templates for tracking student participants and tabulating judges' scores and our judging rubric.

Literature Review

Engineers must continually renew their knowledge in the field to keep up with the newest technological developments. However, studies find that most engineering students struggle with basic concepts in information literacy, such as identifying high quality sources of information and appropriately citing these sources [1]. While the literature on engineering information literacy is growing, there is no consensus on the most effective method of teaching these skills to students [2]. One way that libraries have sought to engage students in learning research skills, which at first glance may not seem exciting or necessary, is to create outreach activities, including games and contests, which directly draw upon information literacy skills in order to win [3]. Presenting information literacy in the format of a game flips the model from passive learning (the student being told what to do) to active learning (the student has a motivation to seek information in order to win). This active learning model is actually much closer to "real world" motivations-- the engineer will need to seek information as part of his or her proposal to win the grant, the project, or the sponsor. Considering this, games and contests become a natural way for engineering students to engage in critical thinking, problem-solving, and information-seeking skills, which will all be of service to them in their future careers.

In an earlier library contest at NYU's Bern Dibner Library, called Project Shhh!, we learned that while students showed gains in information literacy skills and enjoyed the challenge of the competition, other factors contributed to whether students would participate in a library contest [4]. One of the biggest concerns was time: both the timing of the contest within the

semester, in regard to classes and exams, and the duration of the contest. In the focus group convened after the end of Project Shhh!, students expressed interest in hackathons-- a contest model which requires a lengthy commitment, but that commitment is compressed into one period of time rather than across the semester. While hackathons are intensely concentrated blocks of time, studies have found that students are compelled to apply learning strategies and knowledge and are actively “learning by doing” [5]. In recent years, libraries have sponsored hackathons as events that embody “the spirit” of libraries’ commitment to “community, innovation, and outreach” [6].

Hackathons, games, and contests are all forms of library outreach which focus on engaging patrons in problem-solving skills while requiring the practice of information literacy and research skills in order to win. Considering which form of outreach to pick is always dependent on the specific patron population and the information or skills the librarians hope to impart. While we learned from our previous contest that students were interested in a contest of shorter duration, like a hackathon, we still wanted to ensure they had time to conduct a literature review, develop methodologies for investigating user experience, and make connections with faculty. These considerations helped us to shrink the timeline of our contest from 19 weeks (spanning two semesters) to 10 weeks (within one semester). This feedback also influenced the name and broad challenge statement of our contest; the idea of “hacking” something to improve it was familiar to engineering students and the broad challenge statement allowed the freedom to select a problem of interest. When considering our goals in respect to our patrons, we invited faculty members to the initial event in order to inspire the students and to learn more about relevant faculty research at the outset. Studies have shown positive outcomes in librarian/faculty collaboration in engineering courses [7], but we assert it is just as important to see these partnerships operating outside of the classroom. The various categories of people involved in Hack Dibner-- librarians, faculty, staff, researchers, and students-- helps to reinforce the idea that people from different fields and backgrounds may all be part of one research team.

Hack Dibner Overview

Planning for Hack Dibner began a few weeks before the start of the fall semester. Based on the experience of our previous library competition and focus group, we knew that we wanted to keep the overall duration of the contest within one semester and that we wanted to time our kick-off event within the first few weeks of the semester, when students are most excited about enrolling in new activities. Our pre-semester planning involved setting the overall contest timeline, getting specific dates for contest events and workshops on the calendar, and booking a room on campus for our kick-off event. Figure 1 provides the overall competition timeline. We also reached out to faculty members and librarians who could present at the kick-off event and

workshops throughout the semester. Finally, we worked from our old contest libguide to create a new up-to-date guide for Hack Dibner.

Friday, September 21st	Kickoff event
Friday, September 28th	Team sign-up closes Initial concepts due
Friday, October 5th Thursday October 11th	Library tour
Thursday, October 18th Friday, October 19th	Workshop 1: Literature review
Tuesday, October 30th	Guest speaker (Data Science)
Friday, November 9th	Guest speaker (Digital Media) Written proposal draft due
Monday, November 12th	Guest speaker (Digital Media)
Sunday, November 25th	Final written proposal due
Wednesday, November 28th Friday, November 30th	Workshop 2: Presentation skills
Monday, December 3rd	Oral Presentations

Figure 1. Timeline of events during the competition. Bolded dates and events represent student deliverables.

We began promoting the competition on September 3, 2018 and the Hack Dibner kick-off was held on Friday, September 21, 2018 in our library conference room. The kick-off featured a faculty member, who spoke about how technology could improve accessibility in public spaces, including libraries, and a librarian from our cataloging department, who discussed the infrastructure of the current library catalog. After we presented an overview of the contest question, timeline, and libguide, we provided an opportunity for attendees to brainstorm questions such as “Where has technology failed or saved you in your daily life?” This was both a way for the students to actively engage in the competition question at a personal level before applying it specifically to the library, and an opportunity to talk to each other and identify potential teammates.

Seventy-two students completed the initial registration to be a part of the competition. Following the kick-off event, 24 teams (62 students, total) submitted initial concepts, which was how we counted official enrollment in the competition. This was a major improvement

compared to our first iteration of a library competition, in which only 6 teams enrolled. While we expected attrition at each deliverable deadline, we endeavored to keep teams engaged by offering workshops every other week and weekly librarian office hours. Teams earned bonus points by attending workshops, attending librarian office hours, or scheduling a research consultation with a librarian. Our workshop offerings included librarian-hosted topics such as building a literature review and presenting/pitching your research as well as guest speakers from outside the library. The guest speakers ranged from graduate students to faculty members, and they spoke about their research related to topics such as big data, augmented reality, and human centered design.

The first deliverable, the written proposal, which included a literature review, was due on November 9, 2018, six weeks after the initial concept due date. Nine teams (27 students, total) submitted written proposals. Following our feedback, students had the opportunity to submit revised, final proposals on November, 25th. These final proposals went to our panel of judges to score before the final presentations. Of those nine teams, seven submitted final proposals and two ultimately withdrew from the competition. All seven teams who submitted final proposals were in the running to present their final pitches to our panel of judges.

Our panel of judges included one faculty member in the Technology, Culture, and Society department, one library staff member, one data management librarian, one UX librarian, the manager of the engineering school's maker space, and one undergraduate student, who was also a library student worker. The judges committed to reading each team's full proposal before the final pitches and to scoring the written proposal based on a rubric we provided. In addition to the numerical score, they could also leave comments. Judges also had to be present for the entire two-hour final Hack Dibner event, in which each team had 10 minutes to pitch their ideas for how technology could improve library services. Judges were provided with a rubric we created for scoring in the following categories: impact, feasibility, contextual inquiry and user experience, creativity, and the delivery of the pitch. Judges entered these points, and any comments, into the spreadsheets we provided for them during and just after each presentation.

The first place and second place teams were announced at the end of the finals event. Teams filled out forms to win \$500 and \$250, respectively. We also had a writer and photographer from the school of engineering's Media Relations department on hand throughout the final pitches, to document the event and to write up a news article for the school's website [8]. There was also a writer on hand from our libraries' magazine, *Progressions*, who published a story about the Hack Dibner winners in the Winter 2019 issue [9]. This reporting was part of the prize package for the students. From our previous competition we learned that students wanted to be able to highlight their accomplishments in the competition on their resumes. Enlisting Media Relations to cover the competition was a good way to provide the winning teams with a link for their resumes.

Hack Dibner Assessment

A month and a half after the competition, we invited all students who had expressed any interest in Hack Dibner-- from merely attending the kick-off event to presenting in the finals-- to a lunchtime focus group held in the library. We had delayed our invitation to this focus group because we feared it would interfere with final exams. This was a mistake. Waiting until after the winter break to invite the students to chat with us resulted in a low turnout. Only two students attended the focus group, both of whom were members of the second-place team. While we were disappointed not to gather more diverse feedback, particularly from those students who dropped out before the Hack Dibner finals, we were greatly encouraged by our conversation with this limited sample of student participants.

We began the focus group by asking what attracted the students to Hack Dibner. In other words, why sign up for an extracurricular library contest? Student #1 replied, “The most attractive thing was that it was a long-term contest, but not too long... We had time to research our content and research our approach... I had always thought of building for an individual, [I had] not [thought of] an organization as a user.” Since we had adjusted the timing of this new contest, it was good feedback to hear that the overall length of the contest itself was not only feasible for students with busy schedules, but also one of the primary reasons the student enrolled. Student #2 had a different motivation for joining the competition. “I was new here, so I wanted to interact with people and I wanted to learn more about the university as a whole and how things work. The system here is completely different from India. So, it [the contest] helped me to really understand how things work at this university. And, interacting with you guys [the librarian mentors] I really came to understand the resources that were offered by the library.” This response went to the heart of one of our main goals of the contest, which was to foster engagement with librarians and to better understand the resources available to students through their library. To delve deeper into this idea we asked the students, “Did your perception of the library or librarians change as a result of this contest?”

Student #2: For me it was-- in India the librarians, or the professors even, are not that accessible. You can't just go and talk to them if you have a problem. Sometimes it's not that they don't help, but there's a certain level of line between the interaction-- that you can't just go in and discuss everything about it.

Student #1: You have to go through, like, communication channels. I mean, it's not problematic, but it creates unnecessary delays. And particularly in a hackathon, you get to know more problems that people are solving and problems the library is facing, which are not really apparent as a user of the library. So you gain a lot of perspective.

Student #2: This was my first time in the U.S., so I got to learn the system and it was a completely new experience for me of what I'm used to.

Librarian: How did it compare to the official library orientation?

Student #1: Those orientations were more about where things are, but not how you go about using them.

This exchange highlights the idea that students often learn by practical application. A library orientation, or even a one-shot visit to a classroom, cannot compare to the actual practice of conducting a literature review and gathering evidence in order to answer a particular research question. We followed up this question with a more quantitative look at how their perceptions of librarians changed as a result of participating in Hack Dibner.

Librarian: Before Hack Dibner, on a scale of 1-10, how likely were you to reach out to a librarian?

Student #2: Maybe a 1 or 2. This is because of my background, not because of like... (The librarian reassures him).

Student #1: I agree with that.

Librarian: Back to the scale of 1-10-- how likely do you think you would be to reach out to a librarian after Hack Dibner?

Student #2: 8, 9, 10

While these are only two students out of an initial group of 72, it is encouraging that Hack Dibner can have a positive impact on a student's willingness to reach out to a librarian. Besides learning they could contact a librarian for help with research projects, the students were also appreciative of the format of the competition, which forced them to write a proposal and conduct a literature review. This may be somewhat surprising, since it is certainly more work than a typical hackathon, but both students expressed that this work was meaningful and transferable to their academic and career goals. Student #1 said, "Hack Dibner had a research component involved in it as well [as opposed to a 24 hour hackathon]. That is more taxing on us, I think, because, like, we could quickly prototype something, but basing it off of research-- that takes time...If it were only a two week hackathon, we might not have gone to that step where we actually gathered enough information to build a feasible product. Feasible in terms of finances, time involved, all the aspects." Student #2 continued, "I think that structure that you gave us [the proposal template] was actually a major challenge because we had to consider different circumstances. You asked us for feasibility, and financially, and other things, and to give examples for it and I think that's really important because again sometimes we just get caught up in the technical aspect of it. So, looking at it from different perspectives is actually beneficial for me because I've been a freelancer and sometimes we take a solution to a customer and it's not necessarily that this is the best way to do it, it's that this is the best solution to *your* problem." In addition to these perceived gains as a result of Hack Dibner, Student #2 has already found tangible results. He says he was contacted for an interview because of his participation in Hack Dibner. This piece of information came out when we asked what the students thought of the prizes offered, specifically the monetary prize versus the prize of being highlighted on the School of Engineering's webpage.

Student #2: I think that [being on the website] was much more catchier [sic] than the prizes [monetary prizes].

Librarian: How are you using that website link-- is it on a resume or..?

Both Students: It's on my resume.

Student #2: I actually got an interview because of Hack Dibner. I posted it on my LinkedIn and I got contacted because of it.

Student #1: Everyone asks about this project.

Student #2: Yeah, everyone asks about Hack Dibner.

Student #1: The exact thing was the proposal. We have done so much research we were able to explain it to them so well.

Student #2: Generally, when you do a short hackathon, you just know it's a product that solves a particular problem. You might hack a lot of things but you might not think of the financial aspects or-- you just might not think of everything, but when you've looked into a lot of ideas and you have developed it and you know that they're asking for data for real applications, that's really good.

This part of the conversation was not only beneficial in reaffirming our decision to connect with our school's Media and Communications department to feature the Hack Dibner finals on the webpage, but also reiterated that students benefit from the practice of writing a research proposal, such as the one we required for Hack Dibner.

While the two students in the focus group provided very positive responses, we still wanted feedback from students who did not stay in the contest until the finals. A few weeks after the focus group, we sent out a survey, once again to all 72 students who initially signed up. Once again, we recognize our error in waiting too long to solicit this feedback. We had a low response rate of only five students, all of whom were participants in the Hack Dibner finals. Once again, within this limited sample size of participants, the feedback about the contest was overwhelmingly positive. One hundred percent of the survey participants replied "Yes" to the following questions: (Q6) "Did you attend any of the pre-scheduled workshops? Such as: The Dibner IT tour of the Parking Lot project, the librarians' literature review session, the Center for Data Science research talk, the IDM research talk, and the librarians' session on the final pitch?" (Q7) "Do you feel you learned anything or gained any skills during the contest that you will benefit from in your academic or professional future?" and (Q14) "Did you use the Hack Dibner libguide (<https://guides.nyu.edu/hackdibner>)?" We implemented flow logic in our Qualtrics survey, so that a "Yes" response to each of these questions prompted follow-up questions. In the case of workshops, we learned that while bonus points for attendance was a motivator, students were genuinely interested in learning more about their topics.

	(Q5) What motivated you to attend the workshops?	(Q11) Did you learn anything during a workshop that you used in your written proposal or your final presentation?	(Q12) Are there any topics that were not covered by workshops you would have been interested in seeing?
Respondent 1	The relevance to our idea	Yes	The server side
Respondent 2	Learn more	UX ideas from the IDM workshop	N/A
Respondent 3	Assistance/ bonus points	Yes	
Respondent 4			
Respondent 5	I wanted to know more about the library.	I learned about the IT infrastructure already in place that was a part of my proposal.	No.

Figure 2. Student responses to 3 survey questions about contest workshops. Blank boxes indicate no response.

These survey results suggest that if students are highly engaged in the contest, for example all of these students attended workshops and used the libguide, they are probably more likely to make it to the finals of the competition and to affirm that they learned valuable skills through participation in Hack Dibner. The follow-up question to Q7 asked students to describe the skills or knowledge they gained as a result of participating in the contest. This question was only displayed if the respondent replied “yes” to Q7, indicating that they did gain new skills through the contest.

	(Q8) What skills or knowledge did you develop during the contest that you will benefit from in your academic or professional future?
Respondent 1	Project proposal and management
Respondent 2	Pitching an idea and working with a team within a set period of time to complete a project
Respondent 3	Ability to turn a simple idea in to a full proposal. Presenting an idea to an audience, believing in an idea and bringing it to life (entrepreneurship)
Respondent 4	

Respondent 5	I was constantly iterating over my problem statement and trying to build a solution so that it addressed the issue specifically. I believe that as future professional, this will prove helpful for me.
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Figure 3. Student responses to survey question 8. Blank boxes indicate no response.

The knowledge or skills the students describe as gains directly from Hack Dibner fit with our initial goals of developing students’ information literacy skills while also addressing the “soft skills” that are often absent in the typical engineering curriculum. Respondents 1 and 2 mention the ideas of project and time management as applicable skills gained from the contest. Respondent 1, 2, and 3 all mention gaining practice in presenting their research to others, through the proposal and the pitch. Respondents 3 and 5 talk about being able to develop their ideas, both through iteration and through research. This aligns with our plan for the contest timeline to be an entire semester, rather than a compressed hackathon. These students indicate that researching and writing proposals is useful practice as a professional skill. Perhaps even more inspiring is that Hack Dibner seemed to spark true commitment and enjoyment in their research, as evidenced in Respondent 3’s wording, “Believing in an idea and bringing it to life.”

Finally, we asked participants to tell us what they would like us to change about the contest if we to run it again. Two of the respondents gave us no feedback and one wrote “Not sure.” However, two of the respondents gave us helpful advice. Respondent 3 indicated that we needed to provide more opportunities to find teammates. While the contest was open to both individuals and teams, in a semester-long project which requires research, a well-organized team has an advantage over an individual. Moreover, learning to work effectively within a team on project management is an important skill for engineering students to learn. Respondent 5 wanted more information about current problems the library is facing and a more robust description of previous technology and user experience projects in the library. While the kickoff event featured two speakers talking about technology and user experience within the library as well as a portion devoted to finding teams, these respondents indicate that we should re-work these parts of the contest to make them more effective.

	(Q3) What would you change about the contest if it was conducted again?
Respondent 1	Not sure
Respondent 2	
Respondent 3	More opportunities to find teammates
Respondent 4	
Respondent 5	I would have a discussion about the previous projects and a description of what problems the library is currently facing in a session with different teams.

Figure 4. Student responses to survey question 3. Blank boxes indicate no response.

Although we do not have feedback from all students involved in Hack Dibner, we do have libguide data, which provides some insights into that piece of student engagement. Our

libguide was private, so the following data only represent libguide visits by students and librarians involved in Hack Dibner. During the timeframe of the competition, the libguide received 1736 total views. This made it the fourth most active among the guides owned by the engineering library, and more active than any of the engineering subject guides. Additionally, a day by day analysis showed that though there were spikes before important dates such as the kickoff (336 views) and the finals (58 views), the libguide was being accessed by the students consistently throughout the contest.

Our experience with running Hack Dibner and our feedback directly from participants, in the form of the focus group and survey, as well as indirect indicators, such as libguide statistics, has given us insights into the strengths of the contest and plans for future changes. While we had identified finding teammates as an area that needed work after our first contest, Project Shhh!, feedback from participants in Hack Dibner reveals that we still have a deficit in this area of the contest. We are considering making team finding and team building activities a mandatory part of the kickoff event. We are also considering how we can effectively share information about library initiatives or problems around technology and user experience. Adding too many workshops will likely result in lower attendance. Perhaps the libguide, a place we know contestants turn to for information, is a good place to include introductions to these kinds of library initiatives and contact information for teams who want to learn more. Finally, we need to make improvements to the feedback collection itself. We should have followed up with the students directly after the Hack Dibner finals in December 2018. This may have helped us to catch feedback not only from participants in the finals, but also those who dropped out of the contest before the finals.

Conclusion

Our Hack Dibner competition was successful in concluding with seven teams (twenty-one students) competing in the final oral presentations. While at first glance this may seem like an unsuccessful outcome compared to the number of students originally enrolled in the contest, we anticipated attrition throughout the semester and were thrilled to have so many students stay in an extracurricular library competition to completion. We consider Hack Dibner a success not only by the numbers, but by the quality of the work submitted and the transferrable skills gained by the students. Not only did the members of Hack Dibner teams creatively consider ways in which technology could improve user experience in the library, but they also gained experience in writing literature reviews and presenting research before an audience. Our competition was also successful in creating a “triangle of engagement” between faculty, students, and librarians. Faculty, university researchers, and librarians participated in the contest through the kick-off event, engagement activities, and final presentations as judges and audience members. This meant that students not only learned about relevant research projects on campus, but also were able to share their research and receive feedback. Finally, Hack Dibner did not end with the final presentations. The winning team is still having meetings, amongst themselves, with us (their library mentors), and with the head of our library to move their proposal for an improved room reservation system forward through pilot testing. This deep commitment should ultimately result

in a better product for our librarians and our users while providing our students with first-hand entrepreneurial and research experience within the library.

We are not only excited to turn Hack Dibner into an annual event at our institution, but hope that other engineering libraries will also be inspired to run their own versions of Hack [Your Library]. With that in mind, we have created a Starter Kit of materials, including timelines, templates, and rubrics as well as a website <https://wp.nyu.edu/hackyourlibrary/> (under development spring 2019).

Starter Kit

In this section we outline materials that could be used by other libraries to run their own Hack [Your Library] contest. The following sections will cover the competition timeline, outreach, event planning, team management, and judging.

Competition timeline

When considering your Hack [Your Library] timeline, we recommend keeping the competition within one semester, with time at the beginning of the semester for promotion and the final event scheduled before your university's final exams. The timeline can be broken down into two different kinds of events: engagement activities and deliverables. We recommend spacing engagement activities in roughly two week intervals throughout the contest. These activities are intended to keep the students interested in the contest and also offer opportunities for the students to gain new skills. We recommend including workshops on writing a literature review and presenting your research/pitching your idea, but other workshops, such as relevant research projects or speakers at your institution will vary. Consider offering library workshops more than once to help accommodate student schedules. We recommend approaching guest speakers before the contest begins and giving them the option to choose from multiple dates and times for their talks.

We recommend spacing out the deliverables over the course of the competition to keep teams on track and to give them opportunities to visit librarians for help. These deliverables were also a way for us to keep tabs on how engaged the teams were and to monitor the attrition rate. Assigning the first deliverable, called the Initial Concept, one week after the Kick-off gives students some time to think through the contest parameters and form teams. The Initial Concept, a few sentences about the project they were considering, is not demanding, but does demonstrate interest and true enrollment in the competition. The Initial Concept also helps you as the librarian to better prepare resources on the contest libguide that will be beneficial to contestants. Students should be told their ideas can evolve or change from their Initial Concept as the contest

progresses. The second deliverable is a rough draft of a written proposal. Students were provided with a template for the proposal. Once again, this deliverable serves the purpose of keeping the teams on track and determining which teams were still active in the competition. The rough draft also gives you as the librarian a chance to provide feedback and direct students to resources that will improve their concepts before the final written proposal. We recommend scheduling about two weeks between the rough draft and final proposal (deliverable 3) due dates. The teams should be aware that the final proposals will be submitted to the judges in advance of the oral presentations. If a team submits a rough draft but no updated final draft, the rough draft is still given to the judges. We recommend submitting the written proposals to the judges one week before the fourth, and final, deliverable, the oral presentations.

2 Weeks before contest	Start promoting the Kick off event
Week 1	Kickoff event
Week 2	Team sign-up closes Initial concepts due
Week 3/Week 4	First engagement event (Tour of the library)
Week 5	Second engagement event (literature review)
Week 7	Third Engagement activity (Guest speaker)
Week 9	Fourth Engagement activity (Guest speaker) Written proposal draft due
Week 10	Mentors provide comments to teams on their draft proposals
Week 11	Final written proposal due Proposals sent to judges 5th engagement activity (Presentation skills)
Week 13	Oral Presentations

Figure 5. Template timeline of Hack [Your Library] events. Bolded dates and events represent student deliverables.

Outreach

To contestants: We recommend using your institution’s library guides as the Hack [Your Library] homepage. Since most libraries use libguides, this means the librarians do not need to build an entire site to disseminate information to students. Also, placing all of the contest information in a libguide is a way to encourage students to learn about, and visit, other relevant guides. Most of the information on the libguide, such as tabs with contest parameters, timeline,

prizes, judging, and useful resources, remains static throughout the contest. We updated our Hack Dibner Home tab weekly with reminders of upcoming workshops and deliverables: <https://guides.nyu.edu/hackdibner>

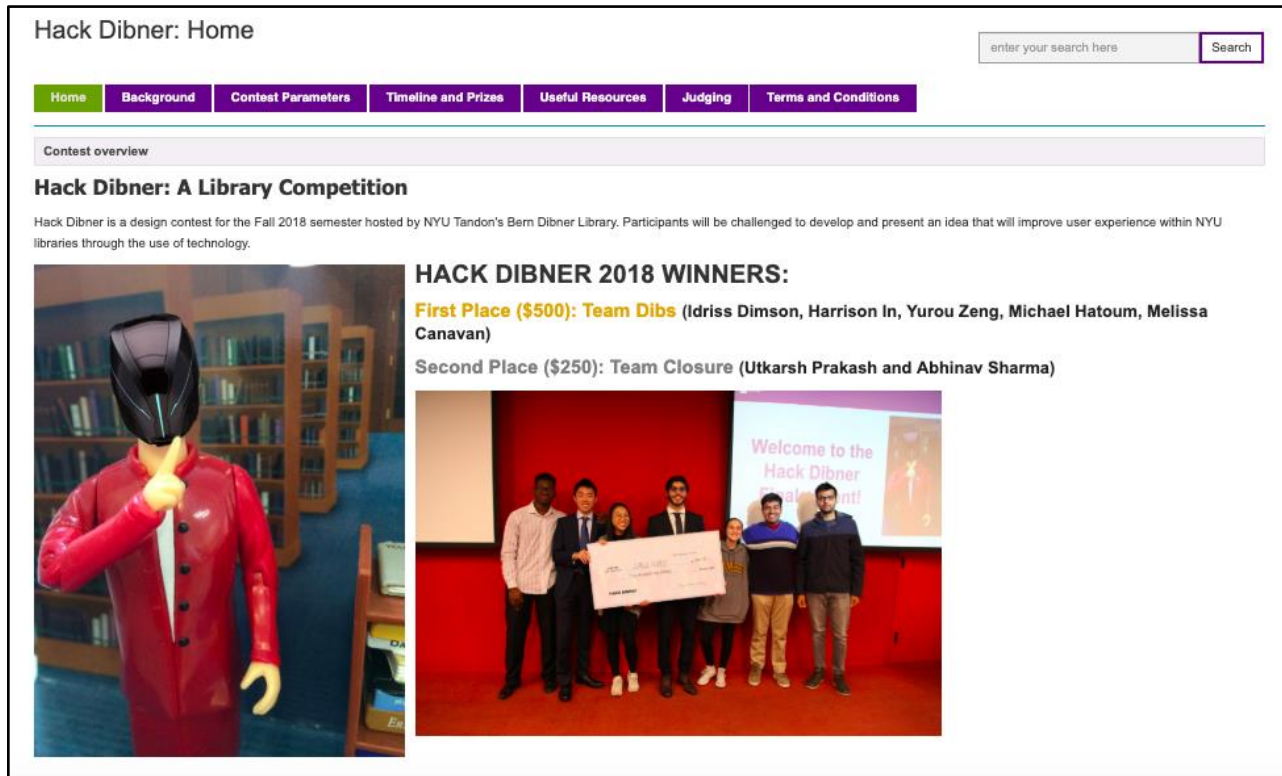


Figure 6. Screenshot of the Hack Dibner libguide after the Hack Dibner finals.

To judges: When planning for the contest judges, it should be determined which librarians or others at the University have unique but relevant perspectives on the student projects. It is crucial to have a diverse set of judges representing various backgrounds and disciplines. For example, a user experience librarian, a chemical engineering student, an accessibility professional, and a data management librarian may be a good assortment of judges. Figure 7 provides an email template which may be used to recruit potential judges.

Dear Potential Hack [Your Library] Judges,

We are writing to invite you to serve as a judge for the Hack [Your Library] competition and to give you some information about what serving as a judge would entail.

Hack [Your Library] Background:

Hack [Your Library] is a contest currently underway with [insert number] teams competing to win [insert prize(s)]. The students have been given the broad challenge to “Enhance user experience within the library through technology.”

The winning team will be determined by tabulating the scores given by each judge, so we are looking for a well-rounded panel. We’re reaching out to you because we think you would be an excellent judge of the students’ use of technology, consideration of user experience, or the feasibility and impact of their ideas on the library and library users! More information can be found on our libguide [link to libguide]

Judging Commitments:

- 1.) Available to attend the entire Hack [Your Library] Finals in person on:
Date
Time
Location
- 2.) Commit to read every team’s written proposal before the Hack [Your Library] Finals. Written proposals will be submitted to you on [date], giving you 1 week to read all of the proposals and to mark your preliminary scores before hearing the pitch.
- 3.) Familiarize yourself with the Hack [Your Library] judging rubric [link]

Please let us know if you can commit to being a judge by [date]. We are happy to answer any questions you may have!

Figure 7. Email template for potential Hack [Your Library] judges.

Events

Kick-off planning: A kick-off event marking the beginning of the contest should be scheduled and promoted from the outset, about two weeks prior. The kick-off serves as an information session for students to decide if they would like to participate as well as giving individuals the opportunity to form teams. During the kick-off event it is important to present to students an overview of the contest, the parameters, as well as the timeline, which can all be

prepared in a slideshow. Additionally, consider having one or more short timeslots (~10 minutes) for presenters from the library or from the university who can concisely present about one particular issue. These anecdotes can provide students with some initial ideas and inspiration about challenges the students were not aware of such as back-end functions or accessibility deficiencies. After all of the speakers, it is critical to allot time for students to form groups and discuss their initial ideas with teammates. If students are not naturally inclined to form groups, some type of short icebreaker activity may aid in students being more comfortable to work together. Once students decide on team members or to work as individuals, they should brainstorm their ideas. A question or worksheet may be used to prompt collaborative ideation. During this time, one or more of the librarians should check in and talk to each group or individual. This allows the librarian to be able to lead the students in further directions and allows the students to better acquaint themselves with the librarian mentor(s). At the end of the time allotted for brainstorming, the first deadline for the submission of the initial concepts should be emphasized which can conclude the kick-off event.

Finals planning: The finals event marks the end of the contest. In planning for the event, the audience, the venue, and the roles should be determined. The event may be open to the public, only to the university community, or simply to the contest participants and the judges, this will likely have an impact on what venue will be needed for the event. Depending on the audience and venue, light refreshments may be provided and the finals event may be promoted about two weeks prior. An MC should be chosen to begin the event, provide the introduction, introduce the judges, review the judging, and introduce each team and moderate the questions asked by the judges. Also, one person should be made the time keeper to hold up signage alerting the presenters how much time is left. For example, if each team presents for ten minutes, a sign may be held up at the five-minute mark, at the one minute mark, and then when time is up. A third person can perform the role of reviewing the scoring after each presentation as well as at the end of all the presentations to be able to finalize a winner and runner-up.

The finals event should be organized with the team presentations in mind. Depending on how many teams have submitted final written proposals, the amount of time each team is limited to present may differ. Below is an example event timeline which may be used for a finals event with 8 teams presenting for 10 minutes each with about 5 minutes of time for questions from the judges. Scheduling may be challenging if students have classes during the event time. This should be considered and students who have an academic commitment should be able to present either towards the beginning or towards the end depending on when would fit best. Teams with no time conflict should be chosen at random for their timeslot. Each team should be notified these details in advance of the event. Communication with the judges about the finals event details is also important.

At the end of the finals event, all teams and participants should be congratulated and a certificate may be given to all who participated. The winning team as well as the runner up should be announced and awarded prizes, which concludes the event.

Team management

We considered team management both in terms of helping our student constants to submit the best proposal possible and in terms of how librarians could track submitted deliverables and workshop attendance. Below we include our written proposal template and the librarians' team-tracking spreadsheet.

<p style="text-align: center;">Written Proposal Template</p> <p style="text-align: center;"><u>Team Name</u></p> <p>List team members below your team name</p> <p style="text-align: center;"><u>Introduction and Brief Description of Proposal</u></p> <p>Discuss the motivation behind your idea. What inspired you to tackle this problem?</p> <p>Use this section to introduce your solution and the problem it is meant to fix. Consider telling the story of what inspired your team's idea-- why you were motivated to tackle this problem? Use this section to try and hook the judges in.</p> <p>You can also use this section to provide an overview to the overall proposal. Prepare the reader for what they are going to see as they continue to read.</p> <p>Things to think about for this section:</p> <ul style="list-style-type: none">● What inspired you? Real life experiences?● Why were you motivated to develop this idea?● Can you hook the reader?● Did you make it clear what the problem you're addressing is and how you are addressing it?● Did you outline a logical flow to your proposal?

Figure 8: Written proposal template for contestants (page 1).

Background/Literature Review

This will be the evidence for your proposal's impact, feasibility, and user experience.

In the introduction you gave a brief description of the problem and your solution. In this section you are going to provide the evidence and background. This is the time for you to go deeper into the problem at hand. Use the literature review to set the stage for both why there is a problem and how your idea could fix it (**impact**). Remember you are only setting the stage in the literature review, you will provide more details in the next section. The literature review can also be a powerful tool to provide evidence of feasibility and user experience. For example, if you are building an app, point to articles that used apps to solve a similar problem. This shows evidence that an app can work (**feasibility**). Does that article talk about how people used the app or provide a methodology for how they would gather user feedback (**user experience**)? These are things you can draw upon and relate to your own project.

Example: If your team decided to build a robot that would clean up the library and reshelve the books, in this section you would explain that the problem at hand is how messy the library is and how none of the books are put back correctly. You can share some photographs or anecdotal stories that verify this claim. Next, you will want to demonstrate that you have looked at the literature to try and find or verify a solution. Provide examples of papers, case studies, etc... that are related to the problem. Perhaps a museum somewhere had a big issue with clutter or maybe a zoo needed an automated way to clean its cages. Did they use robots (feasibility)? Did those robots help (impact)? Were the animals happier with their automated cage cleaners (user experience)?

Remember, in this section you are setting the stage for your solution and providing evidence that you can point to for impact, feasibility, and user experience. In the next two sections you will get into the details of your solution and try to sell the judges on it.

Things to think about for this section:

- Have you made it clear that your issue is a problem in the library?
- Have you demonstrated that there is a need for your solution?
- Have you presented literature on the topic or a closely related one?
- Do you feel confident that you have helped show that your solution can impact the problem, that it is feasible, and that it will improve user experience?

Figure 9: Written proposal template for contestants (page 2).

Methodology and Analysis

In this section you are going to give the judges the details of your idea. Explain to them how your idea will fit into the library (feasibility). If you have mock-ups or graphics this is the section they can go in. Use this section to talk about how your solution will directly affect the library users (impact and user experience). Remember, you are only required to demonstrate a proof of concept.

Things to think about for this section:

- Have you clearly explained how your solution will work?
- Have you reinforced the evidence that your solution is feasible, will have an impact, and will improve user experience in the library?
- Do you have any visuals that you can include, do they help you sell your idea?
- Have you provided an analysis of your solution?
 - Evidence you have already collected
 - Ways the library can continue to collect evidence and assess user experience
 - What it would take to go from proof of concept to final product

The Pitch/Conclusion

Bring together the support from evidence you collected from your literature review, evidence you collected on your own, and what you know about the library and your specific user group. Use all of these things to pitch your idea and why this is a winning Hack Dibner project. This section does not have to be long, but this is where you want to drive everything home

Things to think about for this section:

- SELL SELL SELL
- How did the library ever exist without this?
- You don't need a lengthy conclusion. Finish on a strong point/visual and impress the judges!

Citations and Image Attributions

Be sure to provide citations for everything you reference in the literature review and to provide image credits to any visuals you did not create yourself. You may provide a bibliography and list of image credits at the end of your proposal, or you may build them into the body of the proposal and as image captions.

Things to think about for this section:

- Citation management tools will make your life easier! [insert link to your institution's libguide on citations and citation management]
- Ask a Hack [Your Library] Mentor if you need help

Figure 10: Written proposal template for contestants (page 3).

Team tracking and scoring: Use the following spreadsheet to track team attendance at engagement activities and library mentor hours (i.e. research consultations). Award students one bonus point for each engagement activity attended or research consultation appointment. This document makes it easy to add the bonus points to the judges’ scores at the end of the competition.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	Team Name	Team Members	Consultation	Engagement Activity 1	Engagement Activity 2	Engagement Activity 3	Engagement Activity 4	Engagement Activity 5	Written Proposal Draft	Final Proposal	Late submission -2 points	TOTAL					
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	

Figure 11: Team tracking spreadsheet

Judging

As mentioned in the timeline, we recommend providing judges with the written proposals one week before the oral presentations. Judges should provide preliminary scores based on the written proposals and then finalize these scores after each team presents at the finals. Judges should grade the students on several categories: impact (20 points), feasibility (20 points), contextual inquiry and user experience (20 points), written proposal (10 points), final pitch (10 points), and creativity (20 points).

Provide the judges with judging guidelines and a rubric when they are sent the final written proposals. The judging rubric ensures that all judges will be considering each category in similar ways. We also recommend offering time to meet with the judges in order to discuss the rubric and judging and to answer any questions.

Judging Rubric

Each team's submission will be judged on a 100-point scale. Bonus points will be awarded based on a team's participation in the Hack [Your Library] workshop and lecture series (Library Mentors will add these points to the final score). Each judge will score the team individually. All judges' scores will be averaged together and then bonus points will be added to that score. The highest point total is the winner.

Judges, we are supplying you with a brief description of each judging category along with a rubric to assist you in applying a score to each category. **Please provide preliminary scores in every category, except for the Final Pitch, before the Hack [Your Library] Finals. You will only have 2 minutes after each team presents to score.**

Impact (1-20 points): How well does the proposal identify a problem and provide supporting evidence for how a specific technology will improve user experience in the library for the greatest number of users?

20 points: The team clearly stated and assessed the problem at hand, provided a thorough, supportive, and convincing literature review, and used data, or thought through the methodology of how they would gather data, to validate the proposal's need and impact. The team considered immediate and long-term impacts of the proposal. The team considered how multiple user groups as well as the client (the library) would be impacted, or teams have demonstrated that their proposal will have a substantial impact on their target audience. A small target, but strong impact can still score very highly.

10 points: The team stated and assessed the problem at hand and provided some supportive sources in a literature review. The team considered a limited scope of impact (perhaps only immediate; perhaps only one user group).

1 point: The team stated the problem, but did not supply a literature review, did not provide a methodology for how the proposed idea would be assessed, and did not consider how the proposal would have an impact on library users.

Figure 12: Judging rubric (page 1).

Feasibility (1-20 points): Hack [Your Library] only requires a proof of concept proposal, not a final product. Feasibility will be measured by how well the proof of concept is demonstrated and how much consideration has been taken to transform the proof of concept into an implementable prototype.

20 points: The proposal demonstrated a proof of concept, clearly outlined the cost, time, and resources required to implement the technology. The team provided a clear description of what this technology is, for example the specific software or hardware required. The team considered who and/or what would be needed to implement, run, and maintain the technology.

10 points: The proposal demonstrated a proof of concept, but did not consider all aspects of feasibility (cost, time, resources, personnel). The team explained the general use of technology (for example, a website), but did not explain the specifics of the technology (for example, the code or platform).

1 point: The proposal mentions technology, but does not provide any consideration of cost, time, resources, or personnel needed to implement the technology.

Contextual Inquiry and User Experience (1-20 points): CIUE will be measured by how much consideration was given by the contestants to the needs of the library (client) and the users (patrons).

20 points: The proposal explored the needs of the library and patrons through research (talking with library faculty and staff, consulting library literature, etc.). The team clearly addressed how the proposed technology will improve user experience while considering the needs of the client (the library staff) and the specific space (the library). The proposal considers multiple user groups and acknowledges how their technology will integrate with existing library systems.

10 points: The proposal considered the needs of library and patrons, but did not speak to current library staff or patrons to understand their needs. The team thought about how the technology would improve user experience, but was not specific about a location or a service.

1 point: The proposal acknowledged there are library users, but did not delve into understanding their needs.

Figure 13: Judging rubric (page 2).

Creativity (1-20 points): Creativity will be measured by how the proposal explores the many different aspects of the problem. Successful teams will have shown they have considered the problem from multiple angles (technology, psychology, design, etc.) and will have made efforts to incorporate ideas from different fields. Additionally, the concepts presented will be awarded points based on their uniqueness.

20 points: The team presented a thoughtful, unique solution to the problem. They considered the problem from all angles. The team presented a creative solution backed up by creative visuals or creative presentation style.

10 points: The team showed some creativity in considering the problem from more than one angle/discipline.

1 point: The team drew heavily from existing ideas and showed little creativity in their visuals or presentation.

Written Proposal (1-10): Teams were instructed to address impact, feasibility, and CIUE in their written proposals. Points for this section address how well they wove these ideas together in presenting an argument and the mechanics of the paper.

10 points: The team submitted a complete proposal. They fully addressed all of the required elements and skillfully tied together the concepts of impact, feasibility, and user experience. The proposal provides a clear and convincing argument of why their idea is the best. The paper is free of grammatical and spelling errors.

5 points: The team submitted a complete proposal, but some sections were weak. They addressed each required element, but did not build these ideas together in a convincing proposal. There may be some grammatical and spelling errors.

1 point: The team did not submit a complete proposal.

Final Pitch (1-10): How well did the teams present and pitch their idea?

10 points: The team's final pitch was organized, clear, enthusiastic, provided excellent visuals, and kept the audience engaged. The team did not run over time and was able to answer questions posed to them.

5 points: The team's final pitch was not always clear or organized or was not always engaging. They talked or provided bullet points when they could have used a visual. They may have been rushed towards the end of the presentation or had trouble answering questions.

1 point: The team was not prepared for the final pitch and had no visuals.

Figure 14: Judging rubric (page 3).

Judging spreadsheets: The following spreadsheets organize all of the judging. Provide each judge with a blank judging spreadsheet as seen in Figure 16. By giving each judge an individual scoresheet, the judges were able to remain impartial in their judging.

	A	B	C	D	E	F	G	H	I	J
1	Judge's Name									
2		Team 1	Team 2	Team 3	Team 4	Team 5	Team 6	Team 7	Team 8	Team 9
3	Impact (1-20 points)									
4	Feasibility (1-20 points)									
5	CIUE (1-20 points)									
6	Written (1-10 points)									
7	Final Pitch (1-10 points)									
8	Creativity (1-20 points)									
9										
10	Total	0	0	0	0	0	0	0	0	0
11										
12	Notes									

Figure 15: Blank judging spreadsheet

As the librarian, you will have access to a master spreadsheet of judges' scores. Copy and paste each judge's scores into this master spreadsheet. The master spreadsheet will automatically tally the scores and indicate first (gold), second (silver), and third place (bronze) teams by color. These spreadsheets can also be shared with the competing teams, providing transparency in judging.

	A	B	C	D	E	F	G	H
1		Team 1	Team 2	Team 3	Team 4	Team 5	Team 6	Team 7
2	Judge 1	100	70	55	79	75	70	80
3	Judge 2	100	80	99	98	94	99	80
4	Judge 3	79	70	67	74	59	60	75
5	Judge 4	90	69	69	85	55	65	79
6	Judge 5	92	69	65	79	62	46	73
7	Judge 6	83	80	74	85	78	76	83
8	Bonus Points	4	2	3	2	4	2	2
9								
10	Total	544	438	429	500	423	416	470
11	Final Score	94.66666667	75	74.5	85.33333333	74.5	71.33333333	80.33333333
12	Rank	1	4	5	2	5	7	3

Figure 16: Example of master judging spreadsheet with sample scores and automatic

	A	B	C	D	E	F	G	H	I
2		Judge 1	Judge 2	Judge 3	Judge 4	Judge 5	Judge 6	Judge 7	Average
3	Impact (1-20 points)	20	20	16	18	18	16	108	18
4	Feasibility (1-20 points)	20	20	14	16	18	15	103	17.16666667
5	CIUE (1-20 points)	20	20	16	19	19	15	109	18.16666667
6	Written (1-10 points)	10	10	9	10	9	8	56	9.333333333
7	Final Pitch (1-10 points)	10	10	9	9	10	10	58	9.666666667
8	Creativity (1-20 points)	20	20	15	18	18	19	110	18.33333333
9	Team 2								
10									
11									
12		Judge 1	Judge 2	Judge 3	Judge 4	Judge 5	Judge 6	Judge 7	Average
13	Impact (1-20 points)	10	10	13	15	16	17	81	13.5
14	Feasibility (1-20 points)	15	20	15	10	16	16	92	15.33333333
15	CIUE (1-20 points)	10	15	14	15	12	13	79	13.16666667
16	Written (1-10 points)	10	10	7	6	6	9	48	8
17	Final Pitch (1-10 points)	10	10	8	7	9	9	53	8.833333333
18	Creativity (1-20 points)	15	15	13	16	10	16	85	14.16666667

Figure 17: Judging spreadsheet with individual team breakdown.

Hack [Your Library] website

In order to best use the materials in the Starter Kit, we recommend visiting our Hack [Your Library] website <https://wp.nyu.edu/hackyourlibrary>. This website will serve not only as a space to store helpful competition materials such as timelines, templates, and rubrics, but will also be a space to share the experiences of Hack [Your Library] across different institutions. We hope that other engineering libraries will have similar success in engaging their students' interest in technology and problem solving while practicing research and presentation skills through this competition.

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