

WORCESTER POLYTECHNIC INSTITUTE

Creating Marketing and Promotional Materials for Advocates of Dark Sky Preservation

Supplementary Materials

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Sponsor:
Leibniz-Institute of Freshwater Ecology and Inland Fisheries



**Leibniz-Institute of
Freshwater Ecology
and Inland Fisheries**

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Appendix A: Sponsor Description

The IGB's mission statement says "Research for the Future of our Freshwaters." The organization attempts to truly understand the happenings in the regional freshwaters and the environments submersed in these freshwaters. Their hope is that through their research, decision makers and society will be able to prepare for the changing environment and be able to adapt their conservation efforts based upon the IGB's data ("IGB Profile", 2019). In order to generate more public awareness of their ecological efforts, the IGB fully supplies their research evidence free to the public. This allows them to properly educate the public on pressing matters in their region. Along with their own research being available for the public, the IGB also sponsors various projects such as ACTION and IMPRESS. ACTION is a citizen science program that works against all forms of pollution. The IGB's role in this program is to assist and support the citizen led projects from the initial creation of the project to the final reporting of the results. IMPRESS is a project involving many countries throughout Europe in which research and the latest technologies are used to advance or develop innovative production techniques in efforts to preserve the migratory fish population. Along with conducting research, the IGB also looks to grow public awareness of the social effects on a healthy migratory fish population and their environments ("IGB Profile", 2019). The IGB has enacted a policy that supports citizen science by agreeing to allow open access to their information. They believe open access is a key in helping people in academia and people in the public who need to see peer reviewed scientific research online. These, along with many other projects and programs, allow the IGB to have a well rounded grasp on the effects of the regional environment of Berlin.

The free access to peer reviewed research without legal obstacles and paywalls allows more people to use it and make educated decisions that are sustainable and beneficial to the future. This project is of concern to the IGB because night lights cause pollution to the environment and also to aquatic life. Hence the company works with socio-economical aspects and impacts of increasing artificial illumination on aquatic and adjacent terrestrial habitats, with Berlin-Brandenburg serving as the main research area.

In 1992, the IGB was formed through the combination of three separate research institutions as seen in Figure 1. While the IGB itself was founded then, the three original institutions have roots extending much further into the past. The oldest of them, the Institute for Inland Fisheries (IfB) in Berlin-Friedrichshagen, was created in 1893 and was known at the time as the "Biological and Fishery Experimental Station." The IfB had the distinction of being one of the first research facilities in the field of freshwater ecology ("History of IGB", 2019).

In 1959, the Central Institute for Microbiology and Experimental Therapy created the Department of Experimental Linology at Stechlinsee in Neuglobsow, another founding institution of the IGB. At the time of its creation, this department focused on understanding the effects of the first German nuclear power plant. In the 1980s, the direction of the department shifted towards researching ways to improve the water quality. In 1976, the Institute of Geology and Geoecology established a branch known as the Department of Hydrology, the third predecessor institution. This branch focused on researching environmental protection and water supply. In 1992, along with the IfB and Department of Experimental Linology, the Department of Hydrology was formed into one research institution, the IGB (“History of IGB”, 2019). At the time of its founding, the IGB employed 103 scientists. In 2018, the IGB had 233 employees, 95 of them being staff researchers and 45 being PhD students. Also in 2018, they operated with a €20.8 million annual budget (“IGB Information Flyer”, 2019).

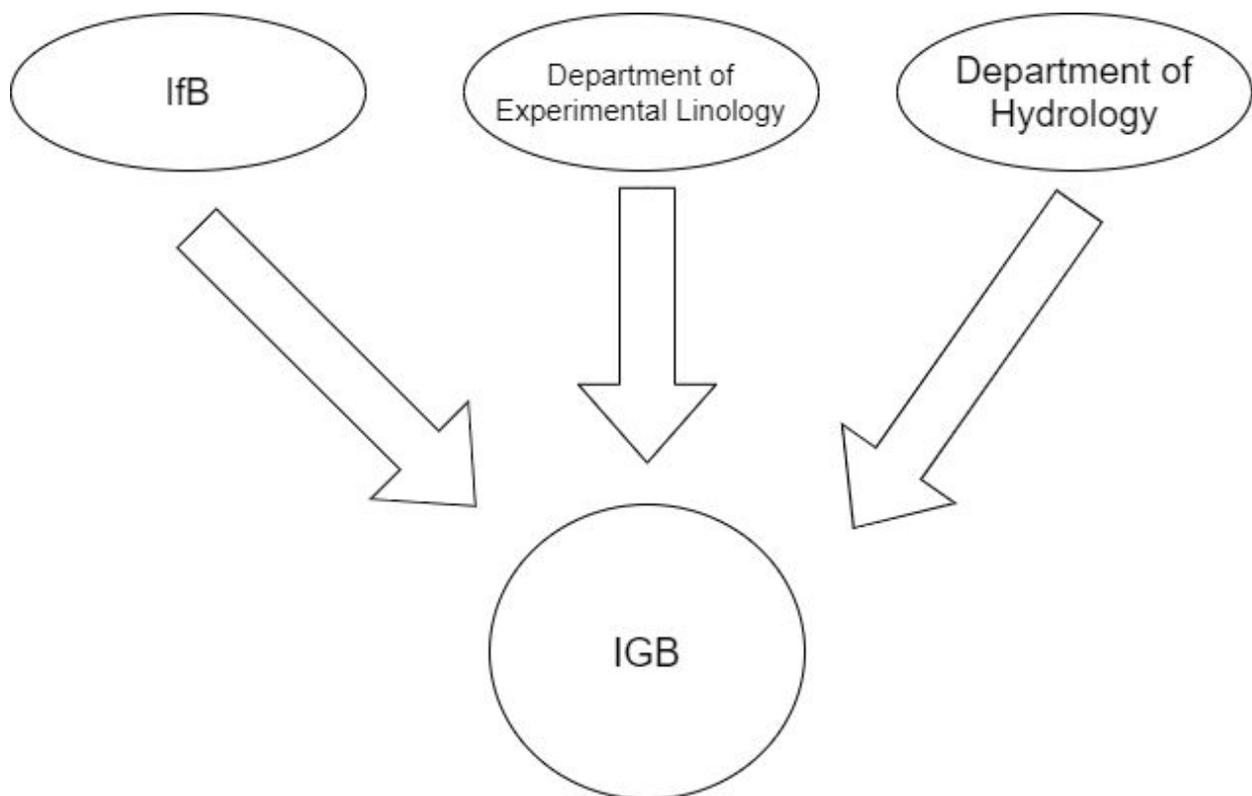


Figure 1: IGB History Flowchart

Appendix B: LotN App General Survey

Loss of the Night Satisfaction Survey

For general users

Where do you live?

- High density city (Population over 1 million)
- Medium density city (Population less than 1 million)
- High density suburban area (Population between 10,000 and 100,000)
- Low density suburban area (Population less than 10,000)
- Other...

Where do you use the app? (e.g.: City center , Small town, Suburbs,

Short answer text

How did you hear about this app?

- Social Media
- Friends
- Colleagues
- Online
- Citizen Science Platform (e.g. SciStarter, Bürger schaffen Wissen)
- Other...

Why do you use this app? (e.g.: Personal value concern, community value concern, personal development, etc.)

Short answer text

About how often do you use this app?

- Every month
- Few times a year
- Once a year
- Not regularly or only a few times ever?
- Never

Why do you use it at that frequency? (What are the barriers preventing you from using more often?)

Long answer text

Did you know making multiple observations from the same location is beneficial?

- Yes
- No

What do you like about the app?

Short answer text

What do you NOT like about the app?

Short answer text

What is your gender?

- Male
- Female
- Non-Binary
- Prefer not to say
- Other...

What is your age?

- Option 1

What is your highest level of education?

- Secondary School or equivalent
- Associates or equivalent
- Bachelors or equivalent
- Masters or equivalent
- PhD or equivalent
- Prefer not to say
- Other...

Would you recommend it to a friend?

- Yes
- No

Appendix C: IJSL Special Edition Interest Survey

International Journal of Sustainable Lighting

Gauging interest for a special edition in the IJSL

Were you planning on publishing any material that you were planning on presenting at the ALAN Conference? If yes, what was the nature of the material?

Long answer text

Did you know that the IJSL offers free publishing?

Yes

No

Would you be interested in publishing work for free in a "special edition" of the IJSL? If yes, please provide your name and email address.

Long answer text

Would you be interested in participating in a longer, more detailed survey about the IJSL? If yes, please provide your name and email address.

Long answer text

Appendix D: LotN Raffle Text

TESS Photometer raffle

Have you ever wondered why the Milky Way does not appear like it does in movies? Due to the ever increasing amounts of artificial light at night, celestial bodies such as stars and planets are becoming increasingly difficult to observe. Help us preserve the night sky by joining the world's longest running measurement campaign. We will be hosting a free raffle for a sky brightness measuring device, a TESS Photometer. The TESS Photometer is an advanced alternative to the popular Sky Quality Meter. It is a small, weatherproof device that can be placed anywhere you have power and WiFi, measuring the brightness of the sky every night and automatically differentiating between various weather conditions. Simply download the *Loss of the Night* app in the App Store or Google Play Store, complete the user data section under the user information tab, and take a complete set of 8 observations on a clear night. By doing so, you will be given one entry into the raffle. Each unique set of observations will result in one entry into the raffle: the more observations you record, the more entries you receive.

For more information on the TESS Photometer visit:

<https://tess.stars4all.eu/>

We appreciate your participation in the campaign against light pollution. Good luck!

Appendix E: IJSL ALAN Poster



The poster features a central lightbulb icon with a leaf inside, symbolizing sustainable lighting. The main title 'IJSL International Journal of Sustainable Lighting' is enclosed in a blue hexagonal frame. Three dark grey hexagonal boxes contain sections for 'Publish', 'Join', and 'Cite'. A blue footer bar contains the website URL.

IJSL

International Journal of Sustainable Lighting



Publish

- **We are inclusive:** We support open access practices and we are inclusive to disciplines not traditionally associated with light pollution research.
- **We are interdisciplinary:** We encourage research from areas including but not limited to architects, engineers, and biologists.
- **We are encouraging:** We welcome grad students and early researchers to publish their research findings in the IJSL to create a forum where early researchers can get their work noticed alongside established experts.
- **We are gaining traction:** The IJSL is a great place to highlight your work. The most highly read article in 2019 received 6368 views.

Join

- **Help us build a community of scholars:** The IJSL is an international platform for sustainable lighting research from a multidisciplinary standpoint.
- **Critical curiosity appreciated:** What sets us apart is a focus on emerging consequences of artificial light at night rather than solely the discussion of light efficiency.
- **All are welcome:** The IJSL supports theoretical, applied and experimental research for a range of disciplines such as energy, ecology, biology, green buildings and astronomy.

Cite

- **Cite articles from the IJSL:** You will not only help to boost our reputation, but you will also help bring attention to the consequences of artificial light pollution. Your citation means more attention and action to promote a sustainable world.
- **Explore new citations and emerging research:** The journal provides a selection of articles on a variety of subjects. Help us recognize this important multidisciplinary work.

How to submit research to the IJSL:

1. Navigate to www.lightingjournal.org
2. Register an account
3. Select "Make a Submission"
4. Review the guidelines

For more information, visit lightingjournal.org

image credit: alfa 8111001 / Alamy.com

Appendix F: Social Media Plan for the LotN app

Social Media Recommendations

Loss of the Night app

WPI IQP Team:

Ryan Crowley, Vinit Kothari, Aaron Whitehouse, Kai Yeaton

Twitter

Twitter provides an excellent choice in social media in marketing. Twitter users range across all demographics, from age to interest in specific hobbies. It also has hashtag functions which work well to connect a post to a movement or interest. In addition, Twitter has been found to connect authors, publishers, and journals on a wide range of topics. We can take advantage of this and put the name of the app more and more online.

Recommendations

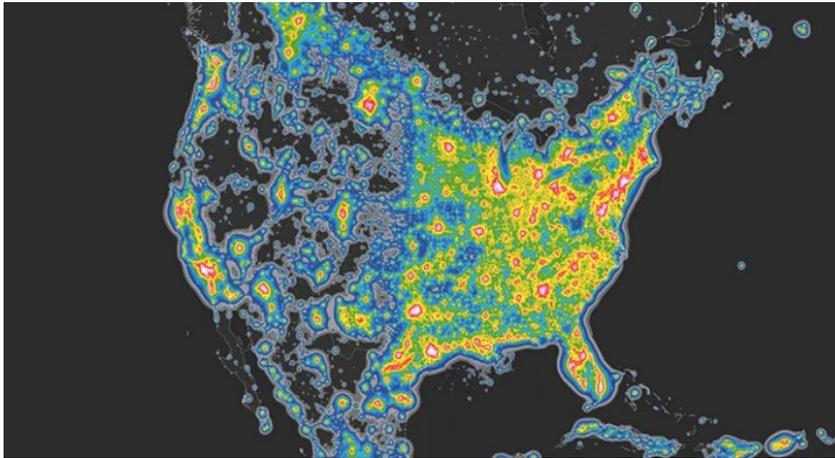
- ❖ Times to post
 - Research shows that the ideal time to post on Twitter for any locality is 0700-1000 from Monday to Friday
 - Posting at this time is ideal because activity on Twitter is highest
- ❖ What to post
 - Engaging visuals such as videos or pictures that show relevant evidence of light pollution in specific localities
 - Example: A picture of the light pollution effects in Berlin to post during the 0700-1000 timeframe
 - Character limit on Twitter is 280 characters, but a short message can be put in for less
- ❖ How to increase followers, specifically through social media
 - Use 1 or 2 hashtags (examples below) to connect the post with other trends happening
 - Direct followers from other platforms to Twitter
 - Follow other relevant pages and ask them to follow you back
- ❖ How to engage with followers
 - Make a full profile with all information
 - Use a free online analytical software to track engagement on account
 - This will help continue the social media plan allowing for further engagement of users
 - All posts can't be promotional, as it comes off as bot-like
 - Post some interesting content interleaved with promotional content

Example Post

1. “The effects of light pollution can be shocking. This video by Science Alert shows a great illustration of what happens at night. #lightpollution #stargazing”

<https://www.sciencealert.com/watch-the-dramatic-effect-light-pollution-has-on-our-view-of-the-night-sky>

- Did you know that 80% of Americans can no longer see the Milky Way from where they live? The graphic illustrates the areas in the US affected by light pollution #lightpollution #MilkyWay



- You can now join the fight against light pollution! Download the Loss of the Night app to help scientists better understand the effects of light pollution #preservethesky #citizenscience

<https://apps.apple.com/us/app/loss-of-the-night/id928440562>

https://play.google.com/store/apps/details?id=com.cosalux.welovestars&hl=en_US

Relevant Hashtags

Light Pollution	Citizen Science	Environmentalism	Astronomy/ Space
#darksky	#doyourpart	#sustainablelighting	#stargazing
#darkskies	#scientist	#lightpollution	#science
#lightpollution	#citizenscience	#awareness	#astronomy
#artificiallight	#greatergood	#nature	#space
#streetlights	#education	#preservethesky	#stars
#carlights	#research	#wildlife	#MilkyWay
#seethesky	#stem	#ecosystem	#cosmology

#LED	#data	#protectnature	#extrasolar
#earthhour	#volunteering	#savetheenvironment	#planet
#changeclimatechange	#jointhemovement	#climatechange	#seethesky

Reddit

From our surveys, we found that most respondents were over 30 years old. To reach out to a bigger audience of people under 30, we chose Reddit, which has a large user share of younger people. Reddit has communities, called “subreddits”, which are groups of “redditors” who are interested in a specific topic. An example of a subreddit is “r/space”, which contains 16.74 million subscribers. Reddit can also be efficiently utilized due to the anonymous nature of the site, where posts can gain traction and attention at no relation to the poster’s number of followers. While Reddit does offer traditional paid- marketing strategies (paying for ad space), you can make posts at no cost to get your message and name out there. Unlike other social media platforms, Reddit uses a system of upvotes (like button), and downvotes (dislike button). The upvotes are what contribute to an account’s “Karma”, which is used as a reward for popular posts or comments. Reddit posts are formatted as a title, a body section for an image, article, or link, and a comment section below.

Recommendations

- ❖ Time to post
 - Ideal times to post are from 0900-1100 EST
 - These are American times, because the majority of Reddit users are located in North America
- ❖ How to gain traction and visibility of Reddit
 - Can’t post to most subreddits unless the account has “karma”
 - Karma can be easily obtained by commenting on various posts by other users. Typically, the threshold for posting content on a subreddit is around a few hundred karma
- ❖ What to post
 - What is considered a quality post on Reddit varies wildly between different subreddits.
 - On **citizen science** focused subreddits, such as r/citizenscience, blatant advertising posts may be allowed as the subreddit’s purpose is to promote citizen science.
 - On **astronomy or space** related subreddits, a more tactful approach is required.

- Some subreddits have rules against promotional posts, in an effort to keep content quality high.
 - Many subreddits will allow you to post promotional posts for the app, since the app is free and it aligns with the subreddits views.
 - One strategy, which can sometimes be against a subreddit’s rules, is when one account creates a post about light pollution, and another account comments, talking about the app and its goal of tracking light pollution.
 - Originality is important
 - Reposted images and posts will be treated harshly, as individual users who find out will often downvote the post.
 - Downvotes will cause a loss of a user’s karma and can lead to distrust in an account
- ❖ Tips and tricks for Reddit
 - Subreddits are controlled by moderators, who sort through posts and have the power to delete posts that do not fall into the community guidelines for Reddit in general, and the subreddit-specific rules
 - This can make it hard to promote a brand, because moderators will actively remove posts if the subreddit does not allow promotional posts
 - Try to engage with comments and direct messages
 - Reddit has evolved to the point where Reddit-specific lingo has been ingrained in the culture and users who don’t follow the unwritten rules will be noticed and may be called out
 - For example, users “sub” to a subreddit, where on other social media platforms it may be referred to as “follow”
 - Emojis are generally frowned upon
 - Refer to the voting options as “upvote” and “downvote”, instead of “like” and “dislike”
 - Contact subreddit moderators and see if they will post your post for you
 - This will attract more attention as mods are flagged and well recognized in the subreddit

Sample Posts

1. For the r/citizenscience subreddit,
 POST TITLE: Help track the change in light pollution!
 POST BODY:
 Hello r/citizenscience,

The Loss of the Night App is a citizen science research tool designed to track the change in light pollution across the globe. Download the app today on the [App Store](<https://apps.apple.com/us/app/loss-of-the-night/id928440562>) or [Google Play Store](https://play.google.com/store/apps/details?id=com.cosalux.welovestars&hl=en_US)

2. For the r/space subreddit

POST TITLE: Help in the fight against light pollution

POST BODY:

I am assuming we are all subbed to this subreddit because we all love space. All of the questions that arise with it and all of the natural beauties within the confines of space are intriguing to all of us. However, most of these sites are being masked by the effects of light pollution. For those who don't know, light pollution is caused by artificial lights at night. The more we have, the less stars we can see at night.

Relevant Subreddits

r/space	r/lightpollution	r/astronomy	r/citizenscience
r/darksky	r/telescopes	r/environment	r/sustainability

Appendix G : Social Media Plan for the IJSL

Social Media Strategies

International Journal of Sustainable Lighting

WPI IQP Team:

Ryan Crowley, Vinit Kothari, Aaron Whitehouse, Kai Yeaton

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- ❖ How to grow userbase, specifically through social media
 - Use 1 or 2 hashtags (examples below) to connect the post with other trends happening
 - Direct followers from other platforms to Twitter
 - Follow other, relevant pages and ask them to follow you back
- ❖ How to engage with users
 - Make a full profile with all information
 - Use a free online analytical software to track engagement on account
 - This will help continue the social media plan allowing for further engagement of users
 - All posts can't be promotional, as it comes off as bot-like
 - Post some interesting content interleaved with promotional content

Sample Posts

1. We are the International Journal of Sustainable Lighting, an #openaccess peer-reviewed scholarly journal. We focus on publishing material about recently surfacing issues about lighting, taken from perspectives across multiple disciplines. Read an article today! (<http://lightingjournal.org/index.php/path>)

2. Only [X] days until the first ever virtual ALAN Conference! Not attending? Go to the #IJSJL website to check out some of the interesting topics discussed at the Conference. Sign up for the newsletter to receive updates about the most recent publications. #sustainablelighting

3. Sea turtles are becoming endangered due to human intervention across the world. Another harmful byproduct of modern life? Light! See how light pollution causes sea turtle hatchlings undue harm. #nature #awareness
<https://www.darksky.org/our-work/sea-turtle-conservation/>)

Relevant Hashtags

Light Pollution	Citizen Science	Environmentalism	Publishing
#darksky	#doyourpart	#sustainablelighting	#peerreview
#darks skies	#scientist	#lightpollution	#openaccess
#lightpollution	#citizenscience	#awareness	#publishing
#artificiallight	#greatergood	#nature	#education
#lightatnight	#education	#preservethesky	#authors
#luminance	#research	#wildlife	#writer
#LED	#stem	#ecosystem	#academictwitter
#earthhour	#data	#protectnature	#sciencetosolutions
#changeclimatechange	#volunteering	#savetheenvironment	#openscience

Appendix H: Team Contributions

Ryan Crowley	Vinit Kothari	Aaron Whitehouse	Kai Yeaton
Sponsor/Advisor Meeting Leader	Communication with sponsors and advisors	Meeting note taker and writing scribe	Agenda Delegator
Video Writer	Video Writer	Video Writer	Video Writer
Primary Infographic Designer	Secondary Infographic Designer	Video Editor/Shooter	Video Editor/Shooter
Primary Poster Editor	Secondary Poster Editor	Secondary Poster Editor	Primary Poster Editor
Writing Writer	Writing Writer	Writing Writer	Writing Writer
Secondary Writing Editor	Secondary Writing Editor	Primary Writing Editor	Primary Writing Editor
Raffle Writer	Raffle Writer	Raffle Writer	Raffle Writer
Survey Writer	Survey Writer	Survey Writer	Survey Writer
Slide Writer/Editor	Slide Writer/Editor	Slide Writer/Editor	Slide Writer/Editor
Social Media Package Writer	Social Media Package Writer	Social Media Package Writer	Social Media Package Writer
Mandatory Fun Creator/Host	Mandatory Fun Host	Mandatory Fun Host	Mandatory Fun Host
Primary IRB	Secondary IRB	Secondary IRB	Secondary IRB
Weekly Schedule Maker	Developed python script for reading app user data	Daily Report and Weekly A3 Report	Booklet designer
		Video voice	

Ryan was the task manager of the team. He set up weekly schedules and helped facilitate sponsor and advisor meetings by moving the agenda forward. On the infographic assignment, he was the primary designer. He also made significant contributions in the design of the poster. He was the owner of the IRB submission, but was assisted in filling out the application by his team.

He created the group's 'Mandatory Fun' activity, and helped teach his group how to host it. He contributed to the weekly writing by helping phrase ideas and authoring many small portions of various sections. He helped edit the weekly writing, but in a smaller part than his groupmates. He created a quarter of the presentation slides, and helped edit the presentation as a whole. For the surveys, he helped draft some of the questions and responses in Google Forms, before his team put them into Qualtrics. He significantly edited the phrasing of the raffle text, and wrote a large sum of the Reddit section for the app's social media outline.

Vinit was the communications manager of the team. He set up weekly meetings with the sponsors and also managed email threads with them on behalf of the team. On the infographic assignment he was the secondary designer. Other than that he also aided in the IRB process. He also was the secondary editor on the poster and contributed in manner. He also fairly contributed to developing the script for the video tutorial. He also handled some of the qualtrics surveys and sent out the extended survey to those who provided their email in the special edition survey. Vinit hosted the mandatory fun activity alongside his team and created breakout rooms for it. He also contributed towards the development of the surveys and the analysis of them. He also aided in creating the Social media guides for the app and the journal. Vinit also was the secondary editor for the writing materials. He was also a part of writing the writing materials and helped put in ideas that would serve the purpose of a section. He also developed a python script that enabled the collection of data from the app's user files. He also contributed towards developing the raffle paragraph and ensuring that it did as was expected. Along with that he also helped create the slides and edit them alongside his team to ensure that all the expected material was included in it.

Aaron was the archivist for the team. Primarily, he was the lead note taker during all meetings. He also was the made scribe during all assignments that included writing, specifically the weekly writing edits, the video script and the social media guide. He researched social media guides to see what they include as well as researched the statistics on when to post for both platforms. Aaron also voiced his opinion during all meetings to help strike conversations on topics of interest. He also took a portion of topics of discussion for each advisor and sponsor meeting. Aaron also was the designer for some of the figures, including the age group figure and sample tweets, included in the presentation and deliverables. He edited and scripted the slides assigned to him for the presentation. He also screen recorded the actions seen in the iOS version of the video along with voicing the script for both videos. Aaron helped Kai, the main video editor, in designing the video layout as well as the visuals. He was able to voice his opinions on the poster edits and design, as well as contribute to the text included on the poster. Aaron was in charge of the daily updates as well as delegating the edits to the weekly A3 report. He voiced his opinions on the questions being submitted into the surveys along with the questions structure and order. He was a breakout room leader during the mandatory fun session.

Kai was assigned to be editor for the writing. He led the efforts to make changes in the project report and contributed with a significant portion of the writing edits and additions. Specifically, he wrote the section about light pollution awareness in the background of the proposal and contributed all sections of the methods and results. Kai also held the primary account on the Qualtrics survey distribution software after the first survey was sent out to the Loss of the Night users. He used the survey reports to analyze the responses and apply them to the objective by determining patterns and trends. Since the stay at home order went into effect, the whole team couldn't meet together to shoot footage for our video. Kai and Aaron were able to collaborate while remaining socially distant to create the necessary footage for the tutorial video. As designer, it was Kai's responsibility to manage the design and creation of the promotional poster for the IJSL. He introduced the main ideas for the first iteration of the posters and suggested the change for the final iteration. In addition, Kai also managed the creation of the IQP booklet. He edited the booklet on Microsoft Publisher up to date with the current status of the project.

Appendix I: Citations

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