Funding Products to Reduce Sports Injuries, and Prolong Activity

Submitted By:

Vasil Bozdo

Brock Dubey

Vivienne Evans

Ravi Palmieri

Project Professors:

Christopher Brown, Department of Mechanical & Materials Engineering

Date:

27th of April 2023

Table of Contents

1. Forward

This paper is a result of the work of Vasil Bozdo, Brock Dubey, Vivienne Evans, and Ravi Palmieri. Each of the members above contributed to one or more of the sections via writing and/or editing.

2. Abstract

The goal of this project is to find ways to fund projects that prevent sport injuries. To solve this problem, we looked into a variety of funding tactics that can be used in order to fund sport engineering projects. Through careful investigation, we determined the best website that can be used to raise funds for sport engineering projects.

3. Objective

The objective of this project is to find ways to fund projects that prevent sports injuries.

4. Rationale

Finding ways to fund projects that prevent sports injuries is worth addressing because it is common knowledge that projects without prior funding do not have resources to advertise to get funding from a wider audience. Therefore the research cannot help those who may benefit from it. When this happens, it is difficult to connect with donors or other sources of funding that are specific to the topic or area of a project.

Young athletes are getting injured often and suffering consequences of injury. As Pruett states, “ACL injuries occur quite frequently, with 100,000-200,000 ACL ruptures per year in the United States alone” (Pruett, 2020).

It is common knowledge that injured athletes may struggle financially or have physical and mental health issues that can be prevented with the proper investments in resources that can help prevent injuries. “In 2020, the average cost of an ACL surgery was about $14,800 . Over $2 billion is spent annually on treating ACL injuries only.” (Law Firm, PC, 2021) This problem is

very costly. Funding that generates awareness of these costs will help launch this project. Injury prevention requires less surgery and therefore less people will be on opioid drugs which may be addicting.

5. State of the Art

Injury Prevention Programs are a way in which we can help produce funding for sports injury prevention. Places such as New Zealand have injury prevention programs in place to prevent injuries as scope may not be limited to just the U.S. As mentioned "In New Zealand (NZ), the Accident Compensation Corporation (ACC) has developed a pre and post-implementation cost-outcome formulae for sport injury prevention to provide information regarding the success of a prevention programme." (Gianotti, Hume, 2007) The cost-outcome formulae approach allows ACC to manage expectations of the prevention programme as well as when it will provide a ROI, allowing it to take a long-term view for investment in sport injury prevention. (Gianotti, Hume, 2007) Further, "Originally developed for its sport injury prevention programmes, the cost-outcome formulae have now been applied to the other prevention programmes ACC invests in such as home, road and workplace injury prevention. (Gianotti, Hume, 2007) This is an option that people in the United States should consider looking into. This could help limit these injuries.

Another way is through crowdfunding. Crowdfunding is an open call on the internet for monetary resources (Gerber et al., 2012). Crowdfunding websites have had exponential growth in popularity. There are currently over 50 different crowdfunding websites in the US only (Gerber et al., 2012). For example, Kickstarter, a crowdfunding website started in 2009 now has more than $7 million per month (Gerber et al., 2012). As mentioned before, two friends with just an idea raised $306,944 in 37 days to develop a coffee warming product on Kickstarter (Gerber et al., 2012).

In the health research field of sports injury prevention and safety promotion, a recognised research-to-practice gap exists (Bekker et al., 2017). Identifying the factors that influence the translation of safety promotion interventions into practices in community sport is the main aim of the overarching NoGAPS project (Bekker et al., 2017). Reducing gaps between (1) policy and practice, (2) efficacy to effectiveness, (3) research knowledge to translation, and (4) elite and

community sport settings were therefore the original partnership goals (Bekker et al., 2017). Within a sports setting, the processes that key organizations employ when developing and disseminating injury prevention and safety promotion resources, is what this study provided insight into (Bekker et al., 2017).

6. Approach

Crowdfunding is a way in which funds can be raised for sports engineering projects. Similar to the coffee warming product on Kickstarter, the crowdfunding method is beneficial to groups that want to raise awareness and funding of their project in a short frame of time. It is similar to the case when two friends with just an idea raised $306,944 in 37 days to develop a coffee warming product on Kickstarter (Gerber et al., 2012). In order to find the best crowdfunding website for sports engineering projects, the website must be relevant to sports topics.

We are looking for the most popular and sport related crowdfunding websites. It is important to highlight the use of schools' funding tools and websites as they promote sports inorder to extend the reach to a greater number of people. Similar to NoGAPS, we are researching funding tactics used by different organizations such as sport companies and other schools. We believe these are some of the most efficient ways to find funding.

7. Methods

The first objective is to search for the most popular, successful and sports oriented crowdfunding websites. A search is for the most popular crowdfunding websites, sport oriented crowdfunding websites as well as crowdfunding websites that have a history of funding sport injury prevention projects. Google was the search engine used in this process. Here, frequently mentioned websites were searched for. Then it was checked if it's possible for anyone to post a sport injury prevention device campaign. Using google as our search engine, sport related crowdfunding sites were searched for.

Using the information in the website, different statistics that describe the credibility of these websites were found. Then, the success rates of the websites were found which is important

because it explains how likely a project is to succeed. After, the number of total campaigns and dollars raised were found which is important because these stats show us the activity on the website, and how much money can be raised for a project; higher values make the website more credible. There was a crowdfunding fee that should be considered. Most crowdfunding websites take a percentage of the money raised by projects in order to support themselves. This fee needs to be as small as possible since it affects the funding target that needs to be set for a project.

Then a system that can be used to rank these websites by success rate and credibility was created, in order to find which would be the most suitable one to fund sports injury devices. After, a weight in percentage to the statistics that were searched for based on their importance was assigned. A table that allows for one to assign a score from 1-10 to each website for each category was then created. In case a certain statistic could not be found, a default score that can be given was assigned. Lastly, a weighted average of the scores for each website was taken and then they were ranked to determine which website is the most suitable.

The second objective is to find and compare crowdfunding options offered by WPI. Then the official WPI crowdfunding website by searching for it in google can be found. After, more information about the timeline of WPI Herd can be found along with the number of crowdfunding sites and the success rate of the website. Then, the first donation dates can be checked which would tie in with our timeline. How many projects are accepting donations can then be found and the number of projects that have met their funding goal can be counted; in order to determine the success rate of the website we must count this number. Lastly, WPI Herd would be ranked among the other crowdfunding websites using the same ranking system as the other crowdfunding websites.

The last objective focuses on exploring funding tactics used by other organizations. Using google as our search engine, a search is held for different sporting companies. A list of sporting companies that are planned to be researched is made. Then, funding tactics used by these sport companies are looked into. Different schools are then searched for, using google as our search engine yet again. A list is then made of schools that we plan on researching and the fundraising tools of these schools is further looked into.

8. Results

This section aims to present our results by separating them into 4 main sections such as Crowdfunding websites, WPI Herd crowdfunding website, Sports Equipment Companies and School startups.

The Crowdfunding websites section contains a list of crowdfunding websites that could be a great fit for sport injury prevention devices projects, information on those websites and the creation of a ranking system that we will use to select the best crowdfunding website to fund sport injury prevention devices.

The WPI Herd section contains information on the crowdfunding solution presented by WPI. This information is later used to rank the website among the other crowdfunding websites in the previous section.

The Sports Equipment Companies section includes a list of sport companies and information on how they fund their products, which can be useful in coming up with alternate ways of finding ways to fund sport injury prevention devices.

The School Startups section includes a list of schools and tools offered by them in order to fund projects. This information can be useful in coming up with more alternate ways of finding funding for sport injury prevention devices.

Crowdfunding:

Kickstarter

Kickstarter is one of the most popular crowdfunding websites. This website was launched in 2009, and ever since then, 22 million people have backed a project by using Kickstarter (Kickstarter, 2023). With a total of over 589,000 projects launched since 2009, there have been a total of $7.27B raised, out of which $6.64B were raised for projects that have met their goal (Kickstarter, 2023). There are 2927 projects currently being funded in Kickstarter, and $54M are currently funding these projects (Kickstarter, 2023). The success rate of Kickstarter is reported to be 40.56% (Kickstarter, 2023). Assuming the project meets the funding goal, Kickstarter charges

a 5% platform fee, and if the project does not meet its funding goal, there are no fees charged (Kickstarter, 2023).

Makeachamp

Makeachamp is the leader in crowdfunding competitive sports (Makeachamp, n.d.). Athletes in 52 different countries are using Makeachamp in order to raise funds (Makeachamp, n.d.). The campaigns in this platform are mainly started by athletes who have a goal in mind. However, we asked the Makeachamp team if a non-athlete could post a campaign about injury prevention devices in their site, and a member of their team, Michael Shpigelman responded that they accept any sport related campaigns (Shpigelman, 2023).

Makeachamp has over 47,000 supporters globally, and they have raised over $7M in total (Makeachamp, n.d.). After looking more into the campaigns posted on their page, as of January 20th 2023, 29 campaigns were ending in 50 days and 8 of them had met over 40% of their goal (Makeachamp, n.d.). Makeachamp has no platform fees, however they have a payment processing fee of 2.9% for each transaction (Makeachamp, n.d.).

GlobalGiving

GlobalGiving is a nonprofit website that supports other nonprofits by connecting them to donors and companies (GlobalGiving, 2019). This website was selected by us because it has a history of successfully promoting injury prevention in the past. GlobalGiving has previously teamed up with Athletic TIPS (Towards Injury Prevention in Sports) to host community workshops across the country to promote a safer experience for kids playing sports from kindergarten through college (n.d. 2016). As of today, the project is not accepting any more donations due to raising enough money for their goal (n.d. 2016).

Since 2002, GlobalGiving has raised a total of $794M from over 1.6M supporters (GlobalGiving, 2019). There have been over 33,000 projects supported in over 175 different countries since 2002 (GlobalGiving, 2019). As of January 2023, there are currently 6386 active projects on this website (GlobalGiving, 2019). GlobalGiving charges a 3% third party processing fee and an additional 5%-12% non profit support fee.

KissKissBankBank

KissKissBankBank is a French crowdfunding website launched in 2009 (KissKissBankBank, n.d.). This website allows the user to post 3 types of campaigns such as goal campaign, a preorder campaign and a subscription campaign (KissKissBankBank, n.d.). This website has a category dedicated to sports where the user can post any campaigns related to sports (KissKissBankBank, n.d.).

Since 2009, KissKissBankBank has successfully supported over 27,000 active campaigns and raised over €152M ($166M) (KissKissBankBank, n.d.). In 2022, the success rate of the campaigns posted in KissKissBankBank was 71% with more than 200,000 pledges (KissKissBankBank, n.d.). Out of all projects posted in this website, 9.07% of projects have been sport related (KissKissBankBank, n.d.). Campaigns created under this category have a success rate of 67% (KissKissBankBank, n.d.). On average, projects on KissKissBankBank reach 136% of their fundraising goal (Mis, n.d.). KissKissBankBank charges a fee of 8% of the amount raised on successful campaigns (Crowdinform, n.d.).

Ranking the Crowdfunding Websites

After having a list of these websites and their statistics, it is important to use these statistics in order to rank the websites and find the most suitable one for our project.

Firstly we need to decide on the criterias that are important to us. The three most important things for us are the likelihood of success, the credibility of the website and the fees charged. The likelihood of success can be measured by the success rate of the website. The credibility of the website can be measured by different factors such as the total number of campaigns and the total amount of money donated through this website. These stats are important because the higher the number of total campaigns, the more reliable the success rate of the website is. The higher the amount of money the website has raised so far, the higher is the chance that a campaign will meet its funding goal. Finally, the fees charged to successful campaigns are important too, since they can change the funding goal of a campaign in order to account for the fees.

The next step is to differentiate between these statistics based on how important they are to us. For this, weight factors can be assigned in such a way that they add up to 100% or 1. This ensures that we are taking a weighted average of these scores for each website, and that we account for all statistics as well as their importance. Next, possible scores need to be assigned from 1-10 for each statistic where the higher the score, the better the website is in this area. There also needs to be a default score that can be placed in case a statistic can't be found. For the purpose of our project, this default score is a 3. This is because a non reported statistic is an indication of it not being good enough to use as an advertising point, however this score also leaves room for worse alternatives.

The stats that we chose to compare for this project and their weighted score are listed below:

- Success rate → weight factor 0.5
- Total campaigns → weight factor 0.1
- Dollars raised → weight factor 0.2
- Crowdfunding fee → weight factor 0.2

Finally, two tables need to be created, one that organizes all the information found in these websites, and another table that shows all the scores for each category as well as the final weighted score for each website. Table 1 organizes all the information found, and Table 2 displays the scores that each website achieved for each category as well as the weighted average of these scores.

	Crowdfunding sites	Kickstarter	Makeachamp	GlobalGiving	KissKissBankBank
Categories	-	-	-	-	-
Success rate	-	40.56%	n.d.	n.d.	71%
Total campaigns	-	Over 589,000	n.d.	Over 31,000	Over 27,000
Dollars raised	-	$7.27B	Over $7M	$794,000	Over $166M
Crowdfunding fee	-	5%	2.9%	5%-12%	8%

Table 1: *Information on the researched crowdfunding websites*

	Crowdfunding sites	Kickstarter	Makeachamp	GlobalGiving	KissKissBankBank
Categories	-	-	-	-	-
Success rate	-	4	3	3	7
Total campaigns	-	8	3	6	5
Dollars raised	-	9	6	4	8
Crowdfunding fee	-	7	8	6	5
Total	-	6	4.6	4.1	6.6

Table 2: *Weighted score of the researched crowdfunding websites*

Ranking of the researched crowdfunding websites:

1. KissKissBankBank (score of 6.6)
2. Kickstarter (score of 6)
3. Makeachamp (score of 4.6)
4. GlobalGiving(score of 4.1)

WPI Herd:

Our next step was to search for crowdfunding options that WPI provides. In this search, we found that WPI has a crowdfunding website called "WPI Herd". This website states that all students and faculty can apply to have their project promoted on their site (WPI Herd, n.d.). The group applying must be in good standing with SAO (Student Activities Office) and have an active account for funds (WPI Herd, n.d.). The projects are recommended to have a timeline, a clear goal of how funds will be used, and a meaningful impact in order to be successful (WPI Herd, n.d.). Once the project is approved, the group will also be offered training in crowdfunding practices (WPI Herd, n.d.).

By looking at the campaigns posted in WPI Herd, there are currently 25 campaigns that currently accept donations, out of which 10 of them have already met their funding goal (WPI Herd, 2023). This gives the WPI Herd website a success rate of 40%. There is also no mention of any platform fees in the WPI Herd website, implying that there is no platform fee for successful campaigns (WPI Herd, 2023).

	WPI
Categories	-
Success rate	4
Total campaigns	3
Dollars raised	2
Crowdfunding fee	10
Total	4.7

Table 3: *WPI weighted score*

Ranking among the previously evaluated crowdfunding websites: third place

Sports Equipment Companies:

3M manufactures and distributes a broad range of products, from building materials and adhesives to medical and home cleaning supplies (Johnston, 2021). The company's Safety and Industrial segment generates the most sales and profits. Shareholders such as the Vanguard group are the highest holders (3M, n.d.).

For Crosby, sports fundraising and shareholders prove to be the best generators of funding for this brand, similar to 3M as previously mentioned (Crosby, n.d.).

DBI Fall Protection is a stocking distributor for DBI Sala Fall Protection, Protecta Fall Protection and Capital Safety Fall Protection Equipment (fisherscinetific, n.d.). Similar to 3M they develop funding through selling their products on third–party websites like ebay (fisherscienticif, n.d.).

Elk River generates funding through city help and private/city loans (Elk River, n.d.).

Erogodyne generates funding through investors and other investments created under this company (Ergodyne, n.d.).

FallTech is geared towards industrial safety use (FallTech, n.d.). Personal Safety and precaution devices (FallTech, n.d.). The top 5 participants in the market - 3M, Honeywell, MSA, Guardian, and FallTech - accounted for 68% to 78% of the total fall protection market. Stocks are their main source of funding (Research and Markets, 2022).

KASK, based in Italy, specializes in developing, designing, and manufacturing of safety helmets of the highest quality (Kask Sport, n.d.). They don’t generate a lot of funding but rather are the number 1 in their area so have great sales and profit from that (Kask Sport, n.d.).

Kenwood is more geared towards electronics and radio systems (intercoms and such) which can prove very useful in improving safety in sports (reducing injuries in sports) (Kenwood Electronics, n.d.). As for funding they are formally PE-Backed (Kenwood Electronics, n.d.).

School Startups:

As for school startups, a group from WPI met with Nike engineers to help design a shoe that could reduce injuries in sports (WPI, 2016). The sole objective here was to prevent ACL tears, focusing on social benefit before the ROI (WPI, 2013). WPI offers ways to help with startup funding; for example, this project received $400k (WPI, 2018). At Clarkson one can see their startup style is to create business plans which help plan for startups of students (Clarkson, 2018). At UVM, they had a website that showcases ways in which sports injuries are prevented (The University of Vermont Medical Center, n.d.). This offers a class that helps with the prevention of sports injuries. Lastly, the University of Arkansas offers a website where applications are located for startup funding (University of Arkansas, n.d.). Along with this, they also offer a startup fair at the college itself (University of Arkansas, n.d.).

9. Discussion

KissKissBankBank was ranked the top crowdfunding website from the ones reviewed. The success rate of projects that used this site was the most notable point that contributed to its ranking. Out of the projects on the site, 71% were successful with their funding goals. In comparison, the next highest success rate of the reviewed sites was 40.56% from Kickstarter. This is not a perfect statistic as found on Makeachamp and GlobalGiving. KissKissBankBank has a drastically higher success rate, which is appealing to someone looking for the best option for collecting funding. In addition, the average project on KissKissBankBank reached 136% of their monetary funding goal, which is a very appealing statistic for someone who wants to fund their project through their website.

For a sports engineering project, such as Professor Brown's *Design of ACL Protection Shoe* MQP, KissKissBankBank was the overall best crowdfunding option. Out of all the projects on the site, 9.07% of the projects were sports related, and they had a 67% success rate. At first glance, given the wide variety of topics that could be made into a fund, this is a relatively high amount compared.

WPI Herd ranked third on the list of the crowdfunding websites reviewed. One strength that this website had over the other reviewed websites was that it had no mention of any platform fees, and it's easier to contact since it's a school website. Once the project is approved, the group will also be offered training in crowdfunding practices, which makes this website an appealing choice for a WPI student to fund a project though.

Despite all strengths, WPI Herd also has room for improvement in different areas. The success rate of WPI Herd was 40%, which matches Kickstarter, but there's much potential for improvement. The website also needs to improve its credibility by funding a higher number of campaigns, and it also needs to display the campaigns that accept donations better. For example, only 11 campaigns are shown on the front page of WPI Herd, and others can only be found by searching.

Most common funding tactics used by other sports companies were shareholders, fundraising, city help, private loans, stocks and private investors. Despite identifying them, reviewing all these tactics in a similar manner to crowdfunding was outside of the scope of our project due to the lack of business background required to fully understand them.

Most common funding tactics used by other schools were identified to be crowdfunding and startups. Most schools include links to their funding options on on-campus resources and off-campus funding sources.

10. Conclusion

To conclude, we successfully developed a ranking system that we used to identify the best crowdfunding website to fund sport engineering projects. We found the best website for crowdfunding to be KissKissBankBank. We successfully found WPI's alternative to crowdfunding to be a website named "WPI Herd"; we evaluated this website and ranked it in third place among the other crowdfunding websites that we researched. We successfully identified several funding tactics used by sport companies; this included shareholders, fundraising, private or city loans, and investors. We determined that researching more into these tactics was outside the scope of our project. Finally, we successfully identified the tactics used by schools in order to raise funds which were crowdfunding and startups.

11. Afterthought

We encountered several challenges and obstacles during this project, most of which were unanticipated. Something that we struggled with was finding other examples in peer reviewed literature writings of students that had done research on funding sport engineering projects. This impacted our project as we had to come up with our own path on how to approach the objective of the project. Another challenge that we experienced was finding funding opportunities offered by sports equipment companies and shoe companies. The information provided in the official websites of these companies was vague, and that limited the options that we could consider about funding sports engineering projects. We determined that shareholders, loans, and private investors are an option for receiving funding, however we also determined that researching more on them was outside the scope of our project. Finally, another obstacle that we encountered was the poor project management by our advisor, Christopher Brown. The decisions made by our advisor regarding the timeline of the project, and the lack of organization have negatively impacted our project.

We have three main recommendations for future work on this project. Our first recommendation is to make an effort to contact different sport equipment and shoe companies about more information regarding funding opportunities that may be offered. Our second recommendation for future work on this project is to do more work on researching private investors and grants that can be given for sports engineering projects. Our third recommendation is to have better organization of the project and its timeline.

12. References

2022-23 catalog. Health, Sport and Exercise Science < University of Arkansas. (n.d.). Retrieved January 25, 2023, from https://catalog.uark.edu/graduatecatalog/healthsportandexercisescience/

3M united states. 3M in the United States. (n.d.). Retrieved February 9, 2023, from https://www.3m.com/3M/en_US/company-us/about-3m/3m-ventures/

About. About | Crosby Equipment | Toledo, OH. (n.d.). Retrieved February 9, 2023, from https://www.crosbyequipment.com/about

Bekker, S., Paliadelis, P., & Finch, C. F. (2017). The translation of sports injury prevention and safety promotion knowledge: insights from key intermediary organizations. *Health research policy and systems*, *15*(1), 1-9.

Clark Scientific: Spotlight on startups at Clarkson University Shipley Center for Innovation. Clarkson University. (n.d.). Retrieved January 22, 2023, from https://www.clarkson.edu/news/clark-scientific-spotlight-startups-clarkson-university-shipley-center-innovation

Clarkson startup, enduraphin, raises pre-seed round of funding to begin production. Clarkson University. (n.d.). Retrieved January 22, 2023, from https://www.clarkson.edu/news/clarkson-startup-enduraphin-raises-pre-seed-round-funding-begin-production

Crowdfund Your Sport Goal for Free. (n.d.). Https://Makeachamp.com/Athletes. Retrieved January 18, 2023, from https://makeachamp.com/athletes

Crowdfunding explained. (n.d.). Internal Market, Industry, Entrepreneurship and SMEs. https://single-market-economy.ec.europa.eu/access-finance/guide-crowdfunding/what-crowdfunding/crowdfunding-explained_en

Crowdfunding's Latest Effort: Preventing Youth Sports Injuries. (2016, February 9). Columbia Basin Herald. Retrieved January 22, 2023, from https://columbiabasinherald.com/news/2016/feb/09/crowdfundings-latest-effort-preventing-youth-2/

Division of Student Affairs University Recreation. UREC. (n.d.). Retrieved January 25, 2023, from https://urec.uark.edu/urec-sports-injury-clinic/index.php

Elk River Machine Company Profile: Funding & Investors: Pitchbook. Venture Capital, Private Equity and M&A Database. (n.d.). Retrieved February 9, 2023, from https://pitchbook.com/profiles/company/254950-48

Ergodyne. CB Insights. (n.d.). Retrieved February 9, 2023, from https://www.cbinsights.com/company/ergodyne/financials

Fisher Scientific. Lab Equipment and Lab Supplies. (n.d.). Retrieved February 9, 2023, from https://www.fishersci.com/us/en/brands/I9C8LUE8/dbi-sala-inc.html

Forbes, H., & Schaefer, D. (2017). Guidelines for successful crowdfunding. *Procedia cirp*, *60*, 398-403

Gerber, E. M., Hui, J. S., & Kuo, P. Y. (2012, February). Crowdfunding: Why people are motivated to post and fund projects on crowdfunding platforms. In *Proceedings of the international workshop on design, influence, and social technologies: techniques, impacts and ethics* (Vol. 2, No. 11, p. 10).

Gianotti, S., & Hume, P. A. (2007). A cost-outcome approach to pre and post-implementation of national sports injury prevention programmes. *Journal of science and medicine in sport*, *10*(6), 436-446.

Global Giving. (2019). *About GlobalGiving*. Globalgiving.org; GlobalGiving. https://www.globalgiving.org/aboutus/

Home. Industrial Safety Products. (n.d.). Retrieved February 9, 2023, from https://www.industrialsafetyproducts.com/brands/FallTech.html?sort=alphaasc&page=21

&gclid=CjwKCAiA2fmdBhBpEiwA4CcHzQTT3kfYc8yrazq5rxFynR-skVqHS8d2zuq8wv_ZOvpI8T-qUG2ncxoC9fgQAvD_BwE

How It Works - GlobalGiving. (n.d.). Www.globalgiving.org. Retrieved January 17, 2023, from https://www.globalgiving.org/aboutus/how-it-works/

Injury prevention. The University of Vermont Health Network. (n.d.). Retrieved January 25, 2023, from https://www.uvmhealth.org/medcenter/wellness-resources/injury-prevention

Johnston, M. (2022, August 5). *How 3M makes money: Safety and industrial products generate most sales*. Investopedia. Retrieved February 9, 2023, from https://www.investopedia.com/articles/markets/022015/how-3m-makes-its-money.asp

Kask Sport. (n.d.). Retrieved February 9, 2023, from https://www.kask.com/

Kask's competitors, revenue, number of employees, funding ... - owler. (n.d.). Retrieved February 9, 2023, from https://www.owler.com/company/kaskspa

Kenwood Electronics Company Profile: Funding & Investors: Pitchbook. Venture Capital, Private Equity and M&A Database. (n.d.). Retrieved February 9, 2023, from https://pitchbook.com/profiles/company/13158-64#overview

Kenwood USA. (n.d.). Retrieved February 9, 2023, from https://www.kenwood.com/usa/

Kickstarter. (2019, May 7). *Kickstarter Stats — Kickstarter*. Kickstarter.com. https://www.kickstarter.com/help/stats

KissKissBankBank. (n.d.). *Crowdfunding statistics - KissKissBankBank*. KissKissBankBank. Retrieved February 1, 2023, from https://www.kisskissbankbank.com/en/stats

KissKissBankBank - Crowdinform. (n.d.). Crowdinform.com. Retrieved February 3, 2023, from

https://crowdinform.com/platforms/crowdfunding-review-kisskissbankbank/#:~:text=KissKissBankBank%20is%20a%20pioneer%20of

KissKissBankBank. (n.d.-b). *Support Adventure & Sports projects of your choice*. KissKissBankBank. Retrieved February 7, 2023, from https://www.kisskissbankbank.com/en/discover?scope=all&category=adventure-and-sport

Law Firm, PC, T. B. (2021, April 13). *The high cost of an ACL surgery | The Bollinger Law Firm, PC*. Bollinger Law Firm PC. https://www.bollingerlawfirmnc.com/blog/2021/04/the-high-cost-of-an-acl-surgery/

Markets, R. and. (2022, September 27). *North American Fall Protection Market Report 2022 featuring top 5 players - 3M, Honeywell, MSA, Guardian, and FallTech*. North American Fall Protection Market Report 2022 Featuring Top 5 Players - 3M, Honeywell, MSA, Guardian, and FallTech. Retrieved February 9, 2023, from https://www.prnewswire.com/news-releases/north-american-fall-protection-market-report-2022-featuring-top-5-players---3m-honeywell-msa-guardian-and-falltech-301634210.html

Michael. (n.d.). *Pricing*. Https://Makeachamp.com/Pricing Retrieved February 7, 2023, from https://makeachamp.com/pricing

Our Fees - GlobalGiving. (n.d.). Www.globalgiving.org. Retrieved January 18, 2023, from https://www.globalgiving.org/aboutus/fee/

Prevention & Care Athletic Inj. uvm.edu. (n.d.). Retrieved January 25, 2023, from https://www.uvm.edu/courses/rms_157

Pruett, A. D. (2020). Is The Use Of Kinesio Tape (KT) Effective In Reducing Pain Postoperative Anterior Cruciate Ligament (ACL) Surgery?.

Qiu, C. (2013). Issues in crowdfunding: Theoretical and empirical investigation on Kickstarter. *Available at SSRN 2345872*.

Search - GlobalGiving. (n.d.). Www.globalgiving.org. Retrieved January 18, 2023, from https://www.globalgiving.org/search/?size=25&nextPage=1&sortField=percent_funded&loadAllResults=true

Staff, A. M. P. (2023, January 17). *Arkansas startup Nanomatronix receives $1.1M small business award*. AMP. Retrieved January 25, 2023, from https://www.armoneyandpolitics.com/arkansas-nanomatronix-small-business/

Startup village: Entrepreneurship and innovation: University of Arkansas. Startup Village | Entrepreneurship and Innovation | University of Arkansas. (n.d.). Retrieved January 25, 2023, from https://entrepreneurship.uark.edu/places/startup-village.php

Tingting, Fan & Gao, Leilei & Steinhart, Yael. (2020). The Small Predicts Large Effect in Crowdfunding. Journal of Consumer Research. 10.1093/jcr/ucaa013/5815563

University of Arkansas Startup Company Showcase. University of Arkansas. (n.d.). Retrieved January 25, 2023, from https://calendars.uark.edu/event/university_of_arkansas_startup_company_showcase

UVM startups. UVM Startups | UVM Innovations | The University of Vermont. (n.d.). Retrieved January 25, 2023, from https://www.uvm.edu/uvminnovations/uvm-startups

Worcester Polytechnic Institute. (2013, June 12). Retrieved January 22, 2023, from https://www.wpi.edu/news/preventing-injuries

Worcester Polytechnic Institute. (2018, October 16). Retrieved January 22, 2023, from https://www.wpi.edu/news/wpi-students-gain-foothold-new-athletic-shoe-sole#:~:text=A%20team%20of%20student%20engineers%20at%20Worcester%20Polytechnic,non-contact%20knee%20and%20ankle%20injuries%20in%20organized%20sports

Worcester Polytechnic Institute. (2018, October 16). Retrieved January 22, 2023, from https://www.wpi.edu/news/preventing-injuries-their-sole-objective

Worcester Polytechnic Institute. (n.d.). Retrieved January 22, 2023, from https://www.wpi.edu/offices/technology-commercialization/startups

WPI Crowdfunding. (n.d.). Support.wpi.edu. Retrieved January 20, 2023, from https://support.wpi.edu/pages/home-2223

Writers, U. (2021, October 14). *How long is recovery time from an ACL tear?* How Long Is Recovery Time From an ACL Tear? - UCHealth Today. https://www.uchealth.org/today/acl-tears-how-long-does-it-take-to-recover-and-return-to-sports/

13. Appendix

Crowdfunding

a. What is it?
    i. Crowdfunding is a method of fundraising in which a group, typically a startup company, urges a large audience to donate to their cause. This is done via online sites such as Kickstarter, Indiegogo, and Patreon.
    ii. There are several kinds of crowdfunding. The most popular of the bunch are peer-to-peer, equity, rewards-based, and donation-based[1]. Peer-to-peer entails that the investors that donate money will be eventually repaid with interest. Equity crowdfunding is similar to the idea of selling stock of a company to investors. Rewards-based is similar to equity, but instead of stock, investors receive a non-financial reward sometime after their investment. Finally, donation-based crowdfunding is "good-will" focused, in which the donors do not get any return.
b. How can students use it?
    i. For college projects, crowdfunding can be immensely useful in many ways. Firstly, it does not require direct networking or negotiating with investors. The crowdfunding campaign can be widespread by sharing links or other advertisements.
c. Benefits?

Due to the nature of crowdfunding, there is no limit to the number of individuals that can contribute. This method of funding heavily relies on advertisement. Depending on the degree of success in advertising a donation, there is no limit to the number of individuals that are willing to provide money for the cause. The number of backers and the amount of money needed per backer are inversely proportional, therefore the higher the participation on crowdfunding events is, the less funding will be needed from one specific individual. However, not everyone is obligated to fund a specific amount of money. This makes the backer feel more comfortable with

[1]

providing the amount of money that they can afford, as they are dictated that even a small amount makes a difference. Eventually, as the amount of funds received increases along with the number of backers, the likelihood of attracting new backers increases significantly, since it is perceived that the risk of this project failing is low (Fan, Gao, Steinhart, 2020).

Another great advantage of crowdfunding is that there is no limit to the amount of money that can be donated for the cause. Since this type of donation heavily relies on advertisement, sometimes these donations can go viral. When this happens, the amount of funds donated can exceed the expectations.

d. Negatives?

Despite all the advantages, crowdfunding is not a perfect method to raise funds. There are a number of disadvantages to crowdfunding that make this method less than ideal. One of these disadvantages is that crowdfunding never guarantees anything. In fact, statistics show that the majority of crowdfunding campaigns fail to reach their minimum goal. 81% of these failed campaigns fail to reach less than 20% of their funding goal (Forbes, Schaefer 2017). This disadvantage is critical, as it makes crowdfunding a non reliable form of funding, and as such the risks of failure needs to be accounted for. Another disadvantage of crowdfunding is that it heavily relies on advertisement. However, advertisement is often expensive and it does not guarantee the success of raising the needed funding. The backers can choose to provide more costly advertisement in order to gain even more backers on a certain project, however the funding spent on advertisement effort is non recoverable. In the end, if the crowdfunding goal is not archived, all backers suffer and the likelihood of the project being successful decreases significantly. (Qiu, 2013)

Authorship

Section	Authors
Forward	Vivienne Evans
Abstract	Vasil Bozdo
Objective	All Authors
Rationale	Brock Dubey, Vivienne Evans
State of the Art	Brock Dubey, Ravi Palmieri
Approach	Brock Dubey, Vivienne Evans, Ravi Palmieri
Methods	Vasil Bozdo, Ravi Palmieri
Results	Vasil Bozdo, Ravi Palmieri
Discussion	Vivienne Evans
Conclusion	Vasil Bozdo
Afterthought	Vasil Bozdo
References	All Authors
Appendix	All Authors

Table 4: *Authorship*

Note: The Table of Authorship is representative of the authors for the writeup specifically. The research and outlining of each section for this paper was worked on in some capacity by all of the authors.