Phase 1 of 3: Will a LinkedIn™ Jr. Optimize Internships for High School STEM Students?

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Abstract. Popular professional online networking sites, such as LinkedIn™, Monster™, CareerBuilder®, and others, focus on traditional jobs. Increasing demand for high school internships suggests an interest for an electronic networking database pertinent to high school opportunities [14]. In comparison to traditional methods of acquiring internships, such a database would provide increased accessibility and efficiency through an HCI conceptualized computer interface. Surveys were designed and distributed to stakeholders, an east coast, chartered high school (students grades 9–12, n = 132), businesses (n = 18), and parents (n = 143), to gather reactionary information. A Kruskal-Wallis, nonparametric algorithm found significant differences ($p < 0.05$) amongst the variables and eliminated errors due to a lack of homoscedasticity. The data found desirability, optimal implementation, and privacy concerns across independent variables. The degree that all stakeholders will feel comfortable in using a database to focus internship potential revolves about the efficacy, presentation, and portal attributes of the database.

Keywords: Internship · High school · Networking · HCI · Database · Survey · Privacy

1 Literature Review

An intern is "a student or trainee who works, sometimes without pay, at a trade or occupation in order to gain work experience" [9]. Internships distinguish themselves from other traditional jobs by focusing on work experience and learning. As a result, internships may not result in payment, since the pursuit of knowledge, instead of wealth, is the primary goal. High school students often seek internships as a means of furthering their knowledge and gaining recognition for their work. "Students who have participated in internships have reported better time management and communication skills, higher levels of self-discipline, increased initiative and improved self-image concepts" [13].

Internships provide benefits for both the employer and the worker [2], and internships provide opportunities that can benefit all concerned. The demand for internships promises a steady increase, with a survey showing that 50 % of 326 surveyed companies were creating internship programs in 2014 [14]. High school and college students seek internships because they make the students' resume more attractive to potential employers. Employers may not give consideration to applicants without prior internships or work experience [16], which makes internships highly prized opportunities for students wishing to someday join the workforce. According to one study, 95 % of employers take work experience into account while recruiting [4]. Thus, internships are reliable sources of this crucial experience for those seeking employment but not yet directly involved in the workforce. Furthermore, internships help develop a skillset vital to a professional setting, including interpersonal relationship skills and confidence in one's work [4]. 92 % of high school interns said they interned in hopes of acquiring new skills, while 81 % said they sought internships for job experience [7].

LinkedIn™, a professional networking site, allows professionals and businesses to connect and network. However, LinkedIn™ is geared towards providing job opportunities, rather than internships. The LinkedIn™ user agreement states that profiles throughout the site specifically target job openings in clause 2.5 [15]. High school students lack diverse connections due to their lack of experience in the work force and the limitations of their age due to legal reasons; LinkedIn™'s concept of connections hinder a student's ability to be acquainted with professionals and thereby internship opportunities.

Social networking sites hold an infamous reputation for privacy concerns, as they, by design, appeal to a large body of people [6]. Barnes [1], sees difficulties stemming from the fact that users, especially those of high school age, may wish to keep their information private but still share it in a public area because they incorrectly assume that the information will be semi-private. A professional high school internship database may require more security than a traditional networking site, as its professional, as opposed to social, nature would require different types of information from the user [11], preventing the divulgence or misuse of information that commonly plagues similar networking sites. "Internships are the link between theoretical knowledge and concepts learned in the classroom setting, and real time industry applications. Internships have long been regarded as an important component in preparing undergraduate students for the entry-level job market" [13]. Knouse et al. [10], examined the relationships between students' academic performance, job offerings and internships and found that "students with internships had a significantly higher overall grade point average, were somewhat younger upon graduation, and were more likely to be employed upon graduation than students without internships" [10].

The main intentions of an internship are "personal real world insights and exposures to actual working life, an experiential, foundation to their career choices, and the chance to build valuable business networks" [12]. *The Atlantic* indicates internships only improve chances of obtaining a job by a "negligible 1.8 % points" in comparison to those who do not participate in internships [5]. The National Association of Colleges and Employers, on the other hand, states that over 63 % of interns are offered job opportunities through a survey in which over 38,000 students participated [3]. Gault et al. [9]

in "Undergraduate Business Internships and Career Success: Are They Related?" state that internship experiences result in "significantly higher levels of extrinsic success than their non-intern counterparts."

Gault et al. [9], in the Journal of Marketing Education, also found that interns reported receiving starting salaries that averaged $2,240 higher than their non-intern counterparts. In addition, the study found that higher salaries, later on in careers, were the result of earlier employment and that interns had obtained their positions approximately 2.36 months earlier than non-interns. The fact that interns started work earlier can be supported by the notion that the internships provided better preparation and "job acquisition skills" [9].

2   Methods

Using Google Forms, three distinct surveys were constructed for high school students, their parents, and local businesses and industries. Information was gathered from these groups. The following response choices were available: Yes or No, choose all that apply, and semantic differentials consisting of Strongly Agree, Agree, Moderately Agree, Moderately Disagree, Disagree, and Strongly Disagree. Student questions focused on the information a student wanted to make available to companies, privacy concerns regarding the database, vocational fields of interest, and a student's opinion on the usefulness. Parents received questions relative to their comfort levels concerning using the database, the opinions of the parents regarding information shared within the database, and any potential parental concerns. The company survey proffered questions on what information each company would require from a prospective intern, the discipline of each respective company, and their opinion on the usefulness of the database. All data was analyzed with the software Minitab®. Significant differences among variables were found by using the Kruskal-Wallis nonparametric statistical method at p < .05.

3   Findings

3.1   Student Survey

The student survey found that 97.0 % of students (n = 132) surveyed believed that a professional networking site focused on high school internships would assist them in acquiring internships (see Fig. 1). There was a significant difference pertaining to students who thought that this would be beneficial to college application and students who wanted to receive feedback with p = 0.004. The survey also revealed a significant difference between how strongly students thought the site would be useful for obtaining internships and how strongly they thought electronic networking would benefit their college application, suggesting that many students desired an internship as a means of obtaining college recognition. The data also showed that 90.9 % of students considered themselves 'comfortable' or 'strongly comfortable' with technology. Students also wanted to receive feedback from businesses through the site. All student respondents claimed to want business feedback on their internship performances, but not all students

wished this feedback to be made public; 81.8 % of students stated that they would want feedback from businesses to be viewable by other businesses (see Fig. 2). 98.5 % of students reported that they wished to read peers' reviews of companies, and 96.2 % wished to write reviews (see Fig. 3). A significant difference with a p-value of .003 existed between the extent that students wanted feedback and the extent that they wished to review companies. Additionally, statistical significance existed between whether the feedback should be posted on the site and if they wanted to give companies feedback. Students, while positive about the prospects of obtaining internships, showed wariness concerning the potential privacy risks surrounding the site. 77.3 % of respondents stated that they would be concerned with having their personal information on a database. 84.8 % of students wanted their information to be viewable only by teachers and businesses, and not by their peers. 56.1 % of students said that they disagreed with including pictures of users on the website. Gender did not play a role with respect photo inclusion. Finally, there was a significant difference between believing an electronic network would be beneficial in the internship process and gaining feedback on one's performance as an intern.

I believe electronic networking would help me get an internship.

Strongly Agree	47	35.6%
Agree	61	46.2%
Moderately Agree	20	15.2%
Moderately Disagree	2	1.5%
Disagree	1	0.8%
Strongly Disagree	1	0.8%

Agree [61] Moderately A [20] Moderately Di [2] Disagree [1] Strongly Disa [1] Strongly Agr [47]

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Fig. 1. Breakdown of students' opinions on the potential benefits of electronic networking

I am comfortable with a company posting reviews about my work experience which other companies will be able to view.

Strongly Agree	17	12.9%
Agree	57	43.2%
Moderately Agree	34	25.8%
Moderately Disagree	17	12.9%
Disagree	7	5.3%
Strongly Disagree	0	0%

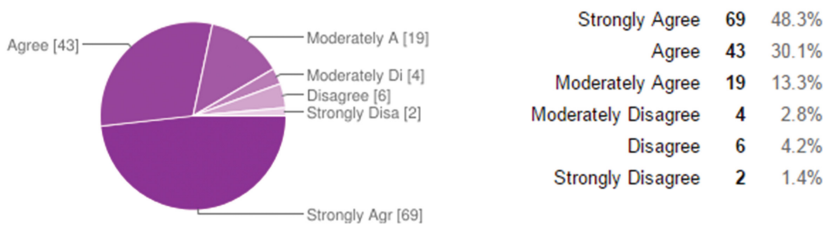Moderately A [34] Moderately D [17] Disagree [7] Strongly Disa [0] Strongly Agr [17] Agree [57]

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Fig. 2. Breakdown of students' opinions on receiving review

I would like to be able to write reviews of companies that I work with.

Strongly Agree	47	35.6%
Agree	63	47.7%
Moderately Agree	17	12.9%
Moderately Disagree	4	3%
Disagree	1	0.8%
Strongly Disagree	0	0%

Agree [63] Moderately A [17] Moderately Di [4] Disagree [1] Strongly Disa [0] Strongly Agr [47]

Fig. 3. Breakdown of students' opinions on reviewing companies

3.2 Parent Survey

Parents (n = 143) displayed similar enthusiasm for the creation of a database centered on internships for high school students. 91.6 % of surveyed parents believed that such a database would help their child find an internship (see Fig. 4). Parents supported the prospect of student and business reviews; 93.0 % supported receiving feedback from businesses concerning their child's performance as an intern, and 91.6 % supported their children reviewing companies. There was no significant difference between the support for giving or receiving reviews and the level of education of the surveyed parent. A strong significance existed between a parent's desire for receiving reviews and for students to be able to review companies, a response similar to that of the surveyed students. 85.4 % agreed that student-related/profile data posted on the site should only be accessible to approved business institutions (see Fig. 5). The parents shared a similar opinion concerning privacy and security, as only 57.3 % of parents were comfortable with their child's photo being displayed on the site. The age of the respondent had no significant effect on the response concerning this matter. A significant difference between the opinions of male, female, and 'did not wish to answer' parents who responded concerning the concept of a photo on the profile page existed. Furthermore, the majority of parents preferred that prospective interns be contacted via a school email, rather than a personal one, with 68.5 % stating that they would be fine with a child's school email being utilized for contact but only 16.1 % stating that they would be willing to have a child's personal email be used (see Fig. 6). Parents expressed a strong overall trust with their children concerning acquiring an internship, as 62.9 % stated that they would be comfortable with children using the site and applying for positions without parental approval, but many desired more involvement once the student acquired the internship, as 62.2 % stated that they would wish to be contacted before their children concerning an internship.

I think a database for my child to find internship opportunities would be beneficial.

Strongly Agree	69	48.3%
Agree	43	30.1%
Moderately Agree	19	13.3%
Moderately Disagree	4	2.8%
Disagree	6	4.2%
Strongly Disagree	2	1.4%

Fig. 4. Breakdown of parents' opinions on the potential benefits of electronic networking
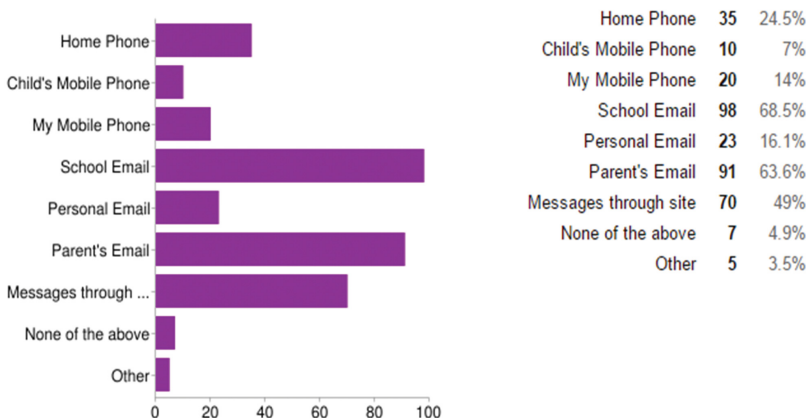
I would feel comfortable with my child's academic information on the site if it were secure and only accessible to approved businesses and institutions.

Strongly Agree	45	31.5%
Agree	52	36.4%
Moderately Agree	25	17.5%
Moderately Disagree	6	4.2%
Disagree	10	7%
Strongly Disagree	5	3.5%

Fig. 5. Breakdown of parent's opinion on displaying their child's academic information

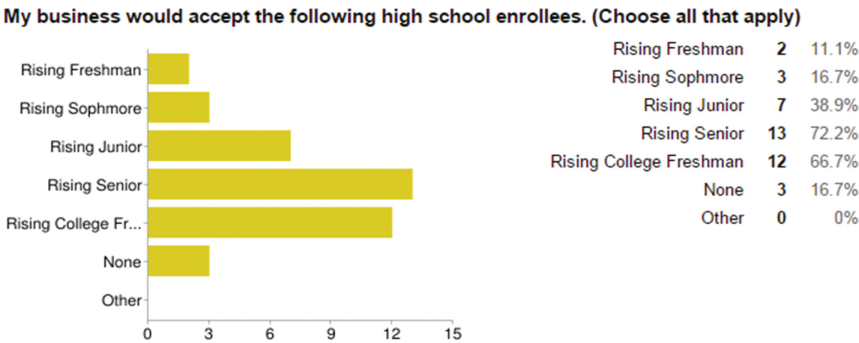**I would feel comfortable with businesses contacting my child via (check all that apply):**

Home Phone	35	24.5%
Child's Mobile Phone	10	7%
My Mobile Phone	20	14%
School Email	98	68.5%
Personal Email	23	16.1%
Parent's Email	91	63.6%
Messages through site	70	49%
None of the above	7	4.9%
Other	5	3.5%

Fig. 6. Breakdown of parent's opinion on forms of contact between their child and a business
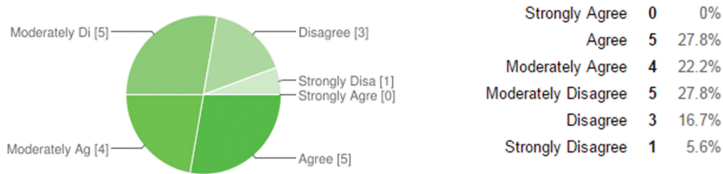
3.3   Business Survey

Of the surveyed businesses (n = 18), 61.1 % responded that they would be willing to hire high school students as interns and 61.1 % responded that they would be interested in using a professional database site to do so. Businesses were more interested in hiring junior and senior high school students; 66.7 % sought rising college freshmen and 72.2 % sought rising high school seniors, while only 38.9 % sought rising high school juniors, 16.7 % sought rising sophomores, and 11.1 % sought rising freshmen (see Fig. 7). 88.9 % of businesses were interested in knowing a student's GPA (see Fig. 8), but no significant difference existed between the type of business and its desire to know a student's GPA (see Figs. 8 and 9). There was no significant difference between how strongly a business valued standardized test scores and how strongly they valued GPA. Businesses also desired to retain security regarding a professional high school database; 66.7 % of businesses only wished to provide contact information to students they had selected for internships, and 33.3 % of businesses stated that they did not wish to make any contact information public to students at all. 94.4 % of businesses supported preventing students from putting inappropriate or vulgar content in their reviews, helping to prevent slander of companies. Businesses, regarding the style of review, shared a similar opinion with the parents and students. 66.7 % of companies surveyed desired the ability to leave comments apropos an intern's performance. 83.3 % of businesses said that they would only want students who had previously held an internship to be able to review the company.

My business would accept the following high school enrollees. (Choose all that apply)

Rising Freshman	2	11.1%
Rising Sophmore	3	16.7%
Rising Junior	7	38.9%
Rising Senior	13	72.2%
Rising College Freshman	12	66.7%
None	3	16.7%
Other	0	0%

Fig. 7.   Breakdown of business's opinion on the grade level for potential internships

My business would like to know prospective interns' GPAs.

Strongly Agree	5	27.8%
Agree	6	33.3%
Moderately Agree	5	27.8%
Moderately Disagree	0	0%
Disagree	1	5.6%
Strongly Disagree	1	5.6%

Fig. 8. Breakdown of business's opinion on the importance of GPA

My business would be interested in prospective interns' ACT, SAT, and/or other standardized testing scores.

Strongly Agree	0	0%
Agree	5	27.8%
Moderately Agree	4	22.2%
Moderately Disagree	5	27.8%
Disagree	3	16.7%
Strongly Disagree	1	5.6%

Fig. 9. Breakdown of business's opinion on the importance of standardized test scores

4 Conclusion

Over 98.5 % of high school students want a way to connect to companies, and 91.7 % of parents encourage this relationship. High school students strongly desire internships and consider themselves comfortable with technology (98.5 %), which supports the plausibility of this platform. Literature and the study's data indicate student enthusiasm derives largely from the fact that they believe they will receive recognition from colleges (97.0 %) as a result of an internship, as well as work experience in their field of interest [12]. Businesses, overall, support the prospect, as 66.7 % of businesses agree with the idea of reviewing high school interns. Businesses are becoming more accepting of high school interns. The main concern for businesses is the students' young age (see Fig. 7). Student age also was a factor in the students' preference of company contact. A significant difference existed between the year of students and their desire to be contacted by businesses before their parents. Both the student and parent surveys revealed a relationship between a desire to write reviews and to receive them, showing the possibility for improvements to existing internship programs that companies offer. There was no significant difference relating education to giving or receiving reviews, showing that all want to contribute to making internships better; this, combined with the strong desire of students to read and write reviews, shows that all involved in this process want the opportunity to learn and grow. The fact that 66.7 % businesses who wish to review interns who have worked with them and that 83.3 % of business wish to receive comments from

interns indicate that companies value both student feedback and security to help prevent students from posting inaccurate or fictitious reviews.

The combination of a more discriminatory selection process as well as dynamic responses allows for the active refinement of the intern through their experience. The fact that no significance exists between businesses wanting to know test scores and wanting to know GPA supports the null hypothesis that a business prefers GPA over standardized test scores, demonstrating that the two are interchangeable and either would be sufficient for the application process. The statistical significance between students believing electronic networking would be beneficial to obtaining an internship and receiving feedback shows that students wish to utilize a high school professional database to pursue internships and also highly value the maintenance of a completely professional and secure atmosphere on the proposed database. The fact that 28.0 % of student are willing to provide their personal email indicates a high concern for web safety and privacy. The lack of a significant difference between male and female opinion of their photo on the website highlights not only a universal concern for privacy, but also a related concern for professionalism.

Because the functionality of searching for interns, based on profile data, depends on students providing certain pieces of information, privacy concerns may arise due to the potential exploitation of this information. Concerns regarding security risks, expressed by parents and businesses, are inherent to any database containing personal information. Both students and parents displayed some reluctance in providing personal information, such as a child's photo, on the website. The surveys did find that students viewed as more mature by their parents were trusted to provide more of their personal information on the website, as a significant difference existed between how mature parents felt their students were and parents' willingness for students to display their photo. Both students and parents preferred divulging non-personal information to businesses, such as an official school email, over revealing information such as phone numbers and personal email addresses. The fact that 88.6 % of students are willing to provide a school email to companies, while only 28.0 % of students are willing to provide a personal email, supports this idea of dual concerns for privacy and professionalism.

Over 72.7 % of students, with no significant difference between males and females, wanted their parents, not just themselves, to be contacted by businesses. However, students valued importance of initial business contact; 79.5 % reported that they would be opposed to a business contacting a parent before the student, with significant differences existing between age and opinion; older students opposed the idea of parents being contacted first more strongly than younger students. The majority of each group desired to be the first contacted by a business, which suggests parents wish to ensure that their children are safe and students want to be independent in their search for work experience. This tension may derive in part from parental safety concerns, and a secure and professional site may relieve some of the concern of parents.

A significant difference existed between gender and willingness to display a child's photo, with parents who are reluctant to divulge their gender discouraging their child from divulging personal information through a photo. A significant difference existed between how mature a parent felt their child was and how willing the parent was to allow the child to display their photo; in other words, parents felt that more mature children

could be trusted to reveal more personal information. Potential security fears could be ameliorated through careful measures taken by the coding team of such a website, as well as the private and professional nature of the site. By focusing this website with the sole intent of connecting employers to prospective interns, this database possesses the potential to circumvent many of the problems found in social media and social networking. A professional database, used by both students and businesses, would allow companies to identify prospective interns and students to identify prospective businesses to intern for, as well as increase the competition between interns by allowing companies to view a larger pool of prospective candidates. Analysis indicates that a database of this type would not only be feasible, but also desirable among both students, parents, and certain business types.

All participants in the survey desire to take part in the internship process; the major obstacle preventing a solid partnership between the prospective interns and companies is a lack of networking. Knouse et al. [10] substantiate the importance of connecting students with employers as soon as possible in order to provide students with the opportunities to excel. Gault et al. [9] indicate that graduates with direct industry experience had a higher tendency to receive a higher starting salary. These two goals drive students and parents to obtain internships. The addition of such a database would provide potential connections in a fast and efficient manner.

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