

Middle School Guide for Academic Success

Learner & Needs Analysis

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Learner Analysis

Component	Data Source (literature, publicly available information, client interviews, user interviews/surveys/observations, etc)	Information Learned (What do you now know about this aspect of learners?)	Potential Implications for Design (What does this tell you about what your design needs to do/should not do or assumptions you can or cannot make within it?)
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<p>Type(s) of learners</p>	<p>The data source were primarily client interviews, email interviews with the participants, discussions with SME.</p>	<p>There are two distinct learner types in the study. Middle school students who are in the age group of 11 - 14 and grades between 6th to 9th are considered for this study and their parents. Since we are concentrating on the middle-class and educated families, the parents and students are both well versed in English language. Some students or parents may have vision difficulties or other disabilities.</p>	<p>Create two different parts of the app - one for parents and one for students</p> <p>The software can address some of the ADA accommodations, for example, providing support for screen readers, choosing neutral color etc.</p>
<p>Prior knowledge/ability</p>	<p>Email interviews with users and secondary research</p>	<p>One of the important takeaways is for the students to learn time management, GPA, colleges, setting goals and importance of co-curricular and volunteer activities. While, most of these will be taught by the application, through research, and subject matter</p>	<p>Since students might not know how to calculate GPA, the application may provide some directions or links for this. Further, an intuitive and minimalist table-system may be introduced for time management, to reduce the learning curve of the student. The</p>

		<p>expert, we found out that not all the middle-school students are aware of the GPA calculation, since they might not even have GPA format of scoring. Hence, the students might need to learn this through some other source.</p> <p>Further, students might need to know how to read timetables since the time-management system might resemble a time-table.</p> <p>Many will have prior knowledge or experience about getting into college but the book is also used by some parents who don't have a lot of prior knowledge about the same topics, such as GPA, time management, etc.</p>	<p>parent's portion of the app will provide links to resources and refer them back to the book to help fill in gaps in their knowledge. The design will be easy to use and the parents will have access to the same step-by-step information as the students.</p>
<p>Motivations</p>	<p>We contacted Subject matter expert to understand some motivations. Further, our email interview study and reading through student notes provided some leads to understand student motivations.</p>	<p>It is crucial that parents and mentors need to encourage students to consider future possibilities. This invites collaboration and subtle push for the students. Further both parents and</p>	<p>Based on our studies, we are considering to include some amount of gamification and task based activities to motivate the students. However, this will be, for the</p>

		<p>students preferred fun and easy to use themed software or technology. Accordingly, this accounts for extrinsic motivation.</p>	<p>most part, an extrinsic motivation for the students. For intrinsic motivation, the application can aid in building confidence via a journey map connotation. Further, students may be given freedom to set their own goals and see them working. This will not only encourage building their confidence but also autonomy. Parents can be involved in the application, such as they can view their child's progress and suggest the conversations to pursue. This can account for more extrinsic and intrinsic motivation.</p>
<p>Learning preferences</p>	<p>Our data source here is secondary research on technology and learning in middle schoolers as well as the role of parental involvement. Our email interviews provided some insight for this as well.</p>	<p>The study from secondary research implies that middle-school students may have more constructive and impactful learning, if they have interactions which have visual and audio feedback. Students also learn better if</p>	<p>App should have a component for parents to be involved as well as the students to make it more effective. Some activities which induces collaboration might be helpful. Further, from our study, we found that both</p>

		<p>parents are involved in their learning. Parents mentioned that some technology would be useful to give them reminders and help with time management and providing more resources.</p>	<p>parents and students preferred technology and accompanying software as an alternative to make good use out of the book to facilitate completing the activities and working on time management.</p>
Special Needs	<p>Our primary source of data here is secondary data, due to lack of primary sources with special needs. Further, we did find some special need requirements from interview with subject matter expert.</p>	<p>National Center for Education Statistics ("The Condition of Education - Participation in Education - Elementary/Secondary - Children and Youth With Disabilities - Indicator May (2016)", 2016) claims that about 13% of the 3-21 age group has some sort of disability. Further, Story (1998) endorses universal design, which has a great potential to improve usability. One of the important thing to consider is designing for disability. It is of prime importance to note that ADA compliance might not be a necessity</p>	<p>Based on the secondary research, we may concentrate on the techniques to assist people with low reading abilities. This will drive the design towards a more universal design. Further, to meet the ADA compliance (although this is not a necessity it may be a good idea to implement) we may need to focus on the minimum required aspects such as, how to design for, Video and Audio, Non-text Content, Text-content, and Color usage.</p>

		here, but implementing it has a potential to drive application towards a more universal design.	
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Type(s) of Learners

There are two distinct learner types in the study. Middle school students who are in the age group of 11 - 14 and grades between 6th to 9th are considered for this study. Another group of learners are the parents of the students. Our primary research was mostly conducted with parents and students hailing from middle-class families. Parents of such students had awareness about the college and opportunities to pursue. Since the app is based on the book, the students and parents need to read/own the book beforehand. However, the application can deliver some minimal content to the learner even if they haven't read the book. Ahn, Beck, Rice, and Foster (2016) talk about the implications of student achievement using educational software. Although few points are relevant, the software we are designing, is more of a casual software, which is companion for non-academic book.

We also considered these common factors:

ESL learners: Since we are concentrating on the middle-class and educated families, the parents and students are both well versed in English language.

Learners' reading/writing level: Minimum of elementary level of english proficiency

Current computer skills: Our primary research indicates that parents are well equipped with the minimum knowledge of computer skills and own iphones or some sort of smartphone.

According to Hingorani, Woodard and Askari-Danesh (2012):

“Smartphone usage in the US has exploded, jumping from just 18% in the third quarter of 2009 to 44% during the third quarter of 2011. Smartphones today have features that are comparable to an average computer, and this handheld mobile device can engage students in far more dynamic ways than a laptop or tablet computer” (p.33)

Further, "Pearson Student Mobile Device Survey 2015" (2016) indicates that 66% of the middle school students use mobile phones with a minimum of standard screen size.

Cultural diversity of group: The app is heavily dependent on the book and the book was not written intending for a specific group of audience, but in general. Our research and discussions with experts indicated that, this book might not be a best fit for low socio-economic families. The book is written for families who are likely middle or upper class and value education.

Level of knowledge about college: None or minimal. The very existence of the book and application is to create awareness of future and college possibilities

Lack of access to technology for some students:

Our secondary research indicated that there is a need for software which is portable and accessible at any point of time, has capabilities of notification, interaction or chat system and updates about colleges. This is possible only if the device is portable. We intend to develop

the software for use with a phone. Based on interviews, most students, or at least their parents, have access to a smartphone.

Prior Knowledge/Ability

It is important that student and parent possess the minimal knowledge to use applications, or at least to open an application in a phone to use it.

The students need to have at least elementary proficiency in English language. Since, the parents are educated (we confirmed this with the client, SME as well as from our primary research), the parents are able to assist students with finishing the tasks and activities in the book. Subject Matter Expert (SME) is a master of science in education with concentration in learning design and technology. She has been working with I had been working with high school and college students full-time for five years. For more information please refer to her [bio](#). There are no complicated data collection and reporting in the book, except for reporting GPAs, listing tasks, entering time for time management, searching and listing colleges. Because, the software will have some stories and animations, it is not expected that the application will have bulky reading content.

One of the important takeaways is for the students to learn time management, GPA, colleges, setting goals and importance of co-curricular and volunteer activities. While, most of these will be taught by the application, through research, and subject matter expert, we found out that not all the middle-school students are aware of the GPA calculation, since they might not even have GPA format of scoring at their school. Hence, student might need to learn this through some other source or, the application may itself provide some directions or links for this.

Further, student might need to know how to read timetables, since the time-management system might resemble a time-table. There was no evidence which indicates that students need to be taught within the software to use the timetable. However, a simple introduction may be introduced in the application.

A minimal set of abilities such as elementary English knowledge, awareness of application usage in general is sufficient to use the application. We need to adapt to students with elementary and middle school knowledge level (Age, 11 - 14) and parents who may not have knowledge about the college application process.

Motivations

From our primary and secondary research, we found that, students might not be aware of college or might not have even thought about it at this point. It is crucial that parents and mentors need to encourage students to consider future possibilities (Vincent & Ball, 2006). This invites collaboration and subtle push for the students.

Papastergiou (2009) discusses the game based design of software for middle school students. He argues that, this method is very effective and provides a motivational aspect for the students. Based on our studies, we are considering to include some amount of gamification and task based activities to motivate the students. However, this will be, for the

most part, an extrinsic motivation for the students. Hence, it is quite important to consider some intrinsic motivational aspects of the students.

Deci, Vallerand, Pelletier, & Ryan (1991) mention that for students to be intrinsically motivated, students must value learning or the benefits of the outcome of the software. From our primary research, we found that students want to manage their time to efficiently organize their tasks. This opinion was shared by parents as well. For example, a student mentioned that he had not really thought about college yet. Instead, he had a slight idea of where he wants to end up in the future. However, one thing he found really really useful was time management activity in the book. One of the parents mentioned that:

“The sections about goals and time management were most useful”

Therefore, this aspect can be considered as an important feature to include in the application.

Further, Deci et al (1991) endorse competence and autonomy as an intrinsic motivational factor. Having confidence (Dweck, 1986), and having the strategies and capacities for success and amounts to intrinsic motivation. Accordingly, students may be given freedom to set their own goals and see how they can work towards them. This will not only encourage building their confidence but also autonomy.

Learning Preferences

Hill and Tyson (2009) that middle-school students may have more constructive and impactful learning, if they have interactions with visual and audio feedback. This can be accounted by providing a way to interact with application such as a video and some interactive activities. Since the book is based on the conversations, before conducting an activity, a short introduction through a video would be helpful. App should have a component for parents to be involved as well as the students to make it more effective.

According to a Pearson Education study ("Pearson Student Mobile Device Survey 2015", 2016), a total of 66% of the middle school students use smartphones. They also found that two in five students use smartphone every week to do their school work. There results were found with 95% confidence interval with a total of 2274 participating students.

“Young people love technology and even parents are beginning to catch on! A well designed app with fun reminders and step-by-step guidance might really be helpful” - Parent Interview

From the primary study, we found that both parents and students preferred technology to supplement the book to aid in time management, task notification and reminders. A portable device such as a smart phone best fits this discussion.

Special Needs

National Center for Education Statistics ("The Condition of Education - Participation in Education - Elementary/Secondary - Children and Youth With Disabilities - Indicator May (2016)", 2016) claims that about 13% of the 3-21 age group has some sort of disability.

Further, Story (1998) endorses universal design, which has a great potential to improve usability. One of the important thing to consider is designing for disability. It is of prime importance to note that ADA compliance might not be a necessity here, but implementing it has a potential to drive application towards a more universal design.

Some of the disabilities that keep someone from enjoying the full experience of an application are as follows ("15 Website Accessibility Tips That Increase Everyone's Engagement | UX Magazine", 2016):

- Color blindness
- Blindness and low vision
- Deafness and hearing loss
- Learning disabilities
- Cognitive limitations
- Limited physical dexterity, such as the inability to use a keyboard or mouse, and more.

Some of the tips to improve accessibility are as follows,

Video and Audio: Video must have some captions, full-text transcript, and a mechanism to stop, pause, mute, or adjust volume of video.

Non-text Content: Adding text alternatives for all images and videos, and naming the controls

Text-content: Break up content with subheadings, label the elements and give instructions, mechanism to identify some input errors, avoid prolonged flashing of the elements and ensure that each page of website has a language assigned.

Color usage: Use more than colors (such as icons, images) to communicate instructions and critical information. Distinguish text links from surrounding text with a clear contrast between the link and the surrounding text that uses at least a ratio of 3:1, then add another differentiator ("15 Website Accessibility Tips That Increase Everyone's Engagement | UX Magazine", 2016).

Needs Analysis

Data Source	Participants	Data type
Participants read the book based on the request from the client	4 Parents and their children	Email interview (Descriptive survey). The parents claimed that they included the responses from their child along with their responses into the email.
Participants read the book based on	1 parent and their children	Email interview (Descriptive survey). We received two

our request		responses. One from the parent and another directly from the student.
Hand written responses provided by the client from the students who used the book	21 middle school students	About half a page each of written comment about the book
Subject Matter Expert who specializes in Learning and Design	1	Interview and discussion of about 45 minutes, a phone call of about 20 minutes and few email communications. Several topics ranging from how this application can benefit students, and also about the intended audience of the book.
Amazon reviews	16 reviews, 11 users	Short-form written reviews of both versions of the book. Major themes were that the book was good for children and parents and the clear steps were helpful. Many reviewers identified themselves as parents who bought the book for themselves or for their child.

Gap addressed

Current State:

We collected the data from the parents and children who read the book and finished some of the tasks and activities listed in the book. More detailed information can be found in the table above.

The major gaps that were expressed by the interview participants was having a way to collaborate with their child and a way to provide reminders for completing the activities. They thought the content was good, but would like a little more detail. Some suggested accompanying software would be useful.

Desired State:

The desired state is a resource that parents and students can use together efficiently and effectively over the entire period from middle school through applying for college. This requires a tool that can remind them to complete activities and the timeline with which they should be doing so.

Although we identified some of the participants, they were mostly suggested by the client. While they are less likely to be unbiased sources, they did provide both positive and negative feedback about the book. We also recruited one more parent and child who were not connected to our client to read the book and provide feedback. The client also provided a set of handwritten notes written by students reflecting their perception of the book. We tried to tie in all these responses with our secondary research to identify gaps and needs for the application design. The usability testing can involve some of the participants who are not suggested by the client.

Gap/ Need and Justification

The book provides a good overview about the directions a middle school student must take to prepare for college. However, there are certain things in the book which would be great if implemented as an application. Using the data from 5 email interviews which involved responses from 5 parents and children, set of responses (a total of 21 notes) from the students which contained half a page of their experience regarding the book, and our discussions with the SME, we created an affinity diagramming.



Figure 1: Affinity Diagramming

According to Beyer and Holtzblatt (1999),

“The affinity diagram maps issues and insights across all customers into a wall-sized, hierarchical diagram to reveal the scope of the problem” (p. 36).

The affinity diagramming helped us in organizing our thoughts and enabled us to focus on the details that can aid in the design and development of application.

Using affinity diagramming we listed the important themes that can influence our design decisions. In the design process, affinity diagramming can greatly aid in creating persons.

1. ***The age group of the students and parent demography:***

The book was used by parents whose children were of age range 11 years - 15 years and in the 6th - 11th grades. This gives a brief overview of the target population of application. Further, all the parents hail from families which are considered middle class and above.

2. ***Importance of GPA:***

“Most kids don’t think they need to start thinking about it until they are in high school but later in high school years. GPA is incredibly important the day they start high school...most middle schoolers might not realize that.”

Parents talked about how GPA can have impact on the student’s future while choosing a college. The above quotation is from a parent who talks about importance of GPA and further added that the provides a good overview in highlighting it’s importance.

3. ***Activities in the book:***

“I copied down the questions and answered them for myself along side her doing it for herself. (There is some great advice and strategies that even us parents can benefit from at home and in the workplace). I found it helpful in my own life”

Parents mentioned that they finished the activities by copying down the questions and answering them alongside their child. This was resounded by other participants as well. They claimed that their children finished the activities by themselves. It is important to not the collaboration between the parent and child at work.

4. ***Conversation Starter:***

Most parents were aware that students have to prepare for the college as early as possible. However finding an appropriate occasion was a tough task for the parents. These were the thoughts explicitly shared by parents.

“We were already talking a lot about college, but I believe this book has helped our son to look beyond local schools and to begin considering larger, more prestigious schools as an option for him”

They also mentioned that evidence can play an important role in starting a conversation.

“Sometimes advice from parent's goes much further with a child if it is backed by evidence, especially when they can relate to the authors.”

Further, from the notes we found that students found this book as an effective conversation starter and as a motivational factor to prepare for the college early.

“I have planned to finish high school and go to top notch university. Before I got this book I used to procrastinate my homework and projects. But now that I know about time management I finish my homework on time. When I first learned about GPA, I didn't really take it seriously. But when I found out that the college I want to go needs at least a 4.0 GPA, that was when I started to work harder”

5. Importance of Goal Setting:

Another important theme that emerged during the affinity diagramming method was the importance of goal setting. This was a common theme among many parents and students separately.

One of the parents expressed as follows,

“Right now just recognizing the importance of setting goals at a young age and also to be "well rounded" stood out to me right now at my daughter's age.”

Further, students also shared a similar view about importance of goal setting.

“I learn to understand goals, and to have parents, or mentors to help us out”

An important thing to notice here is the dependency of students to reach out to their parents/mentors to seek feedback on their goals. This invites collaboration and students seem more confident if parents were to assist them in setting goals.

6. Importance of Extracurricular activities:

Importance of extracurricular activities is another theme that emerged during the affinity diagramming phase. Parents mentioned that that conversation on extracurricular activities was particularly helpful, because their children can branch out and get more involved. A parent mentioned as follows,

“.. this book is a good reminder that it takes more than just good grades to get accepted at some of the good universities. As a result, she is doing her best to participate in extracurricular activities”

It is important to notice that the parents are quite aware of the implications of extracurricular activities and they can use this book as a supplemental proof to make a case for their child.

The impact of extracurricular activities were resounded by students as well. For example:

“This book inspired me to volunteer and now, I volunteer at the Paw Prints helping with soon-to-be adopted animals. There is a female cat named Jacobella and she is very playful. This book influenced me to do something great!”

Students not only got inspired from the book, they did some actionable tasks to get one step closer to the goals.

7. Reinforce collaboration

Throughout the conversations and notes, there was a lot of stress on reinforcing collaboration. One the parents mentioned as follows,

“We made it fun and filled out the worksheets together”

There are two elements to it, as this was the theme throughout multiple conversations; Fun and Togetherness.

However, this was not the same perspective of students. They liked the book, but they did give it a persona of fun.

“Even though they wasn’t the most fun book to read, it helped us to learn about what our future may look like”

Although there a “fun” part missing from the student’s perspective, they still liked the idea of the book.

8. Factor of motivation

This theme discusses the motivational factor of students and also the parent’s perspective of motivation.

“This book uses easy to understand concepts, illustrated with stories and experiences that motivates a middle school student at least start to think about college and understand some of the steps it's going to take to get there.”

There were students who found the book demotivating as well. This may be due to the bulk of the work the book proposes or might simply reflect how student sees the book.

“Thank you for making me read the book that did nothing to motivate me. It only made some students feel dumb... I knew what I wanted my future to look like already. It only made me feel I would never accomplish anything, but I know that’s is not true”

It is important to note that student was forced to use the book. This accounts for the need of intrinsic motivation. Further a parent who can act as a guide may be important. However, there were students who found this book motivating.

“It helped me to get motivated to make a schedule for all of my activities. Now I am better at managing all my tasks .. If you aim high and work hard, good things will come out of it. If you aim low, you probably won’t get much”

Below is a summary of Gaps and needs that were found during our primary and secondary research. It should be kept in mind about the subtleties of the aim behind this application. The research does not in any way makes a direct suggestion to how this book can be improved. This is not the scope of this study.

All the themes that were found in during the affinity diagramming process are completely valid. However, due to the time constraint, we chose to concentrate on some of the important and most stressed upon topics to pursue.

We understood that there is need to aid with time management and GPA entry. This needs to go into the application, because not only book endorses the need for it, but parents and students both see its usefulness as well. Whether GPA really aids in students learning or not is not a point of our concern since, our results might contradict the book. This is definitely not the aim of our study, since the scope of this application to the capabilities of this book in not assist it. Reminder system was much stressed upon, during our study. This may help them to keep them organized. Several parents and students mentioned the value of time management and how that can help them be organized. An efficient time management system can assist the book in helping to create great experience for the students.

Several participants mentioned the importance of using portable technology, which would make the product experience pleasant and enjoyable. Moreover, this further supports the fact that a mobile application can best augment this experience. Furthermore, this is fact is backed up by our secondary research as well. Foster (2016) endorses the usefulness of software application in student success and achievement.

Another theme that is recurrent and important is stress on the collaboration. Many parents mentioned that book acted as a proof to start conversation and further it helped them to work with their children collaboratively to set goals and finish activities in the book. Further, we found that students needed some help from parents/mentors to set goals and finish activities. They can help in prioritizing these activities. This is well supported in the literature as well. It is crucial that parents and mentors need to encourage students to consider future possibilities (Vincent & Ball, 2006). This invites collaboration and subtle push for the students. An effective way to improve collaboration will be considered as primary theme for this application and is further discussed in the design document.

Finally, we considered the motivation theme as it is very important (Vansteenkiste, Simons, Lens, Sheldon, & Deci, 2004) for a student to pursue learning and finishing a task. Both students and parents mentioned that they feel motivated by reading the book and following its instructions. This constitutes the intrinsic motivation. Further, they mentioned that collaboration further augments the motivation. This can be taken as an important point to be considered while designing application. Extrinsic motivation is important for designing application as well (Draper, 1999). Papastergiou (2009) discusses the game based design of software for middle school students to improve extrinsic motivation. Implementation of gamification can provide motivation for students to use the application, which is possible only if a technology alternative is provided. More detail on this will be provided in the design document.

Context Analysis

Our application context is of a phone application, as it satisfies the need for portability and great usability. The software can be used by parents/mentors at home/school respectively and by students at both home and school.

The book is currently being used both in schools and at home during social time. Our client mentioned that many teachers use the book in homeroom classes with groups of 10-20 students. The book is also used with parents one-on-one in the home environment. For the purposes of this project, we are going to focus on students and parents who are using the book at home. This is the population where we were able to get our primary research data.

Further, from our study we found out that although the book was intended for students, it was mostly first used by parents then it was suggested to students. This is well reflected in the comment by a parent as follows:

“Realistically, I think mostly parents will be reading this book, not middle school kids. As a parent, I would have benefited more from the book if it was geared more toward the parents”

Parents acted as motivational and directional factor for the students to help them organize, set goals and think about college and its requirements. The implication was to introduce two separate interfaces and logins for parents and students and need for collaboration between them.

The software will be accessed on a phone or a tablet, with the possibility for use on computers as well. Many middle school students and families have phones or tablets and this has been discussed before in detail in the previous sections with the proof from secondary sources.

Although the idea of using social media integration can be helpful in this context, the social media with right strategy can aid in learning and collaboration ("How Social Media Can Help Students Study", 2016). However, the feasibility has some challenges. For example, the social media integration can have some privacy implications since GPA is shared. Also, we do not have the necessary primary source to back this up. Further, we are also bound by the time constraint to collect more information on this and pursue a suitable design. This can be treated as a future consideration for analysis and design.

Goal Analysis

Problem statement

Initially, client wanted an application to accompany the book. There were no prior research documentation or data sets available.

We tried to understand the problem, by reviewing some related literature and initial conversation from client, which looked something like this:

“To design a software to accompany the book, in a fun and collaborative way”

Further, after the data collection and analysis our problem statement evolved like this,

“Middle school students and their mentors in a home setting need a guide to help them complete the activities in the book, ‘The Middle School Student’s Guide to Academic Success: 12 Conversations for College and Career Readiness’ facilitating collaboration between parents and students and preparing students for college by teaching them skills such as time-management, goal setting and being aware of importance of GPA for future college considerations.”

Goals

A low-level goal would be to make students be aware of myriad possibilities with respect to colleges. This needs students to be prepared on multiple things such as knowing how to manage time effectively, the importance of GPA since most colleges have high GPA cap and preparedness in general by setting goals directed towards college and interested major.

A high-level goal is to accompany the book with an engaging software, which complements the capabilities of book, and thus accelerate the adoption of the book.

There are no non-instructional goals associated.

High priority goal is to design software that engages students and incorporates activities from the book in a meaningful way. Further, to motivate students to make better use of the book and prepare for college through the lens of collaboration. The parents have great role to play in enabling motivation and collaboration, hence they will act as mentors and provide directions for the students, while subtly providing opportunity for students to be self-reliant. This will in turn help students to be aware of the college and pave a way for their future.

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