

# Project Proposal

## Plamen Tassev

I chose the research track and will attempt to answer the following question:

*Can children ages 5 to 13 enhance their math skills using smartphones or tablets and what are the most effective apps for this?*

To answer the question of my research I plan to:

- Explain why technology should be considered as a tool in education and learning.
- Answer the question of how children learn and develop their cognitive abilities in general.
- Outline the characteristics of apps which can be used to enhance children's learning.
- Analyze apps and deliver a list of effective apps which can be used to aid children in learning math.
- Obtain and analyze data describing what teachers and parents think about the use of smartphones and tablets as educational tools.

I will briefly restate the reasons I chose this topic. I have two children ages 6 and 10 and would like to know more about the ways I can help them expand their knowledge using smartphones and/or tablets. I know that the use of technology in early education is growing rapidly. I see this as I walk into my children's' classrooms and wondering what use a smartboard has in the classroom as well as noticing the use of iPads and laptops being used by my children during the school day. At the beginning of the EdTech course, I did some research and found out that most academic articles on this topic are focused on the use of technology in the classroom. I am not an educator, and I am interested to see if I can find out ways I can use my smartphone or a tablet to help my children learn during their free time (for example when commuting in the car). I know that there are many apps which claim to help children learn, but I also want to know which apps do so effectively and determine what makes them successful. After a brief amount of research, I was not able to find an answer to my questions and I am excited that EdTech gives me this opportunity to attempt to answer them.

While working on assignments 2 and 3 I found multiple articles describing how technology is used in the classrooms today. I also found that the ownership of tablets and laptops among children is increasing, and I researched some of the positive and negative effects smartphone usage has on children.

The qualifying question assigned to me gave me the opportunity to further research my topic and find literature explaining how children learn according to developmental psychology. I

researched mainly Jean Piaget's stages of cognitive development and Lev Vygotsky's Zone of Proximal Development (ZDP). I also found research illustrating how Piaget's and Vygotsky's theories are applied in the modern day schools.

I believe I have enough information to start on my final project and I plan to find more sources as needed. Following is a list of sources I plan to use:

Ageyev V., Kozulin A., Gindis B., Miller S. (2003). Vygotsky's Educational Theory in Cultural Context. *Cambridge University Press*

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Andronico, M. (2014). Kids Are Playing With Screens More Than Traditional Toys, Survey Says downloaded from: [https://www.huffingtonpost.com/2014/02/24/kids-playing-with-screens\\_n\\_4834484.html](https://www.huffingtonpost.com/2014/02/24/kids-playing-with-screens_n_4834484.html)

Blake, B.,Pope T.(2008). Developmental Psychology: Incorporating Piaget's and Vygotsky's Theories in Classrooms, *Journal of Cross-Disciplinary Perspectives in Education Vol. 1, No. 1 p.59 - 67*

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Campbell, R. L. (2006). Jean Piaget's Genetic Epistemology: Appreciation and Critique.

Ciampa K (2013) Learning in a mobile age: an investigation of student motivation. *J. Comput. Assisted Learn.*, 30 (1) (2014), pp. 82-96

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Hoyt, C. L., Blascovich, J., & Swinth, K. R. (2003). Social inhibition in immersive virtual environments. *Presence: Teleoperators and Virtual Environments*, 12, 183–195.

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Pearce, N (2013). Digital Game-based learning for Early childhood. *Learning Innovation*. Retrieved from: <http://www.learnovatecentre.org/research-report-digital-game-based-learning-for-early-childhood/>

Shabani, Karim; Khatib, Mohamad, Ebadi, Saman (2010). Vygotsky's Zone of Proximal Development: Instructional Implications and Teachers' Professional Development. *English Language Teaching Vol. 3, No. 4*

Shroff, A. (2017). Piaget Stages of Development. Retrieved from:  
<https://www.webmd.com/children/piaget-stages-of-development#1>

Williams, A. (2016). How Do Smartphones Affect Childhood Psychology?. *Psych Central*. Retrieved on May 26, 2018, from <https://psychcentral.com/lib/how-do-smartphones-affect-childhood-psychology>

Zielezinski, M.(2016). What a Decade of Education Research Tells Us about Technology in the Hands of Underserved Students. *Ed.stanford.edu*, 2016. Retrieved from:<https://ed.stanford.edu/news/what-decade-educationresearch-tells-us-about-technology-hands-underservedstudents>.

I plan to conduct quantitative and qualitative analysis.

Qualitative analysis :

- Analyze existing apps from Android Marketplace. There are many apps on Android Marketplace claiming to help children learn math. I plan to analyze the reviews left by the app users. This way I hope to find out more about the characteristics of the apps aiming to help students learn math. In addition, I have downloaded two apps for learning multiplication and division on my phone and I let my daughter practice her skills twice a day for about 20 mins each time. I plan to gather information about what she likes about the apps and find out if her math skills are improving (both apps use scores).
- Interviewing math teachers. Fortunately, my wife is an educator and I am hoping to conduct interviews with several math teachers. This way I hope to find out more about the teachers' opinion on the subject as well as some suggestions they have for utilizing technology as a teaching tool.

Qualitative analysis.

- I plan to conduct a survey of parents which have children ages 6-10. To find participants I can use piazza, facebook, and email. I need to review from HCI how to design a survey, execute it, and analyze the data I gather.

Task list.

Throughout my career, I have had the opportunity to work with several models for tasking and planning and utilized several systems of tracking and planning time. The 3 models which stick out are waterfall, agile, and agile-scrum. Considering the nature of this project I decided to use the waterfall approach. Some of the reasons for my decision are:

- The scope of the project is mostly clear and defined.
- The deadline is clearly defined and intermediate milestones are clearly defined.
- The requirements for the project are not likely to change during the execution.

- The TA assigned to me is experienced and will advise me if I need to change my scope, rearrange my tasks, add or remove tasks, or change time estimates.

Below is the task list I was able to compile from using the class syllabus.

Week	Due Date	Hours	Task
June 18 -June 24		2	Start formatting research paper. Outline research paper format.
June 18 -June 24		1	Review sections in HCI course related to conducting interviews.
June 18 -June 24		2	Start working on interview questions for teachers interview.
June 18 -June 24		2	Continue researching academic articles.
Weekly Status Check 1	June 25	1	Submit weekly status check 1.
June 25 - July 1		2	Finalize interview questions for interview with teachers based on given feedback.
June 25 - July 1		1	Recruit teachers for an interview.
June 25 - July 1		4	Prepare survey questions for survey with parents.
June 25 - July 1		2	Start researching apps Android Marketplace.
June 25 - July 1		2	Continue to researching academic articles.
Weekly Status Check 2	July 2	1	Submit weekly status check 2.
First Milestone	July 2	3	Submit First Milestone for review: 1. Teacher interview questions. 2. Survey questions.
July 2 - July 8		2	Continue analyzing Android Marketplace.
July 2 - July 8		3	Conduct interviews with teachers.
July 2 - July 8		2	Finalize questions for survey with parents.
July 2 - July 8		2	Start online survey with parents.
July 2 - July 8		2	Continue researching academic articles
Weekly Status Check 3	July 9		Submit weekly status check 3.
July 9 - July 15		2	Analyze findings from interview with teachers. Prepare a summary from the findings
July 9 - July 15		2	Analyse findings from survey survey with parents. Incorporate Findings in research paper.
July 9 - July 15		3	Analyze findings app review. Include findings in final research paper.

		2	Prepare a list of effective apps to include in project paper and powerpoint for presentation
July 9 - July 15		2	Conduct online survey with parents. Stop survey at the end of the week.
Weekly Status Check 4	July 16	1	Submit weekly status check 4.
Second milestone	July 16	3	Submit Second Milestone for review submit: 1. Results and analysis from interview questions 2. Results and and analysis from survey questions
July 16 - July 22		3	Summarize and analyze results from survey with parents. Incorporate findings in research paper.
July 16 - July 22		5	Prepare powerpoint presentation.
July 16 - July 22		5	Prepare video presentation for final project.
Weekly Status Check 5	July 23	1	Submit weekly status check 5.
July 22 - July 29		2	Finalize video presentation for final project.
July 22 - July 29		8	Prepare and review final paper. Make sure APA citations are used correctly and verify sources.
Submit Final PaperWork	July 29	1	Submit research paper. Submit Presentation. Submit Video Presentation

The total of the hours is 74. This does not include the hours spent since the beginning of the course.