

2014

Technology integration for educators : The why and the how

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Technology integration for educators : The why and the how

Abstract

This project explores TPCK (Technological Pedagogical Content Knowledge) and its use in successful technology integration in the classroom. It also discusses the implications of technology integration if TPCK is not used. It consists of two main sections. The first section is a brief explanation of the importance of pre-service and in-service teachers to have a well-rounded knowledge including technological knowledge in order to accomplish technological integration. The second and larger section is a library of video tutorials and evaluations on technology tools for the classroom and examples of how they could be used using TPCK.

Degree Type

Open Access Senior Honors Thesis

Department

Teacher Education

First Advisor

Michael McVey

Keywords

Technology in the Classroom, TPCK, tools, apps, applications, teacher professional development

TECHNOLOGY INTEGRATION FOR EDUCATORS THE WHY AND THE HOW

By

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A Senior Thesis Submitted to the

Eastern Michigan University

Honors College

in Partial Fulfillment of the Requirements for Graduation

with Honors in Elementary Education

Approved at Ypsilanti, Michigan, on this date Dec. 16, 2014

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Abstract

This project explores TPCK (Technological Pedagogical Content Knowledge) and its use in successful technology integration in the classroom. It also discusses the implications of technology integration if TPCK is not used. It consists of two main sections. The first section is a brief explanation of the importance of pre-service and in-service teachers to have a well-rounded knowledge including technological knowledge in order to accomplish technological integration. The second and larger section is a library of video tutorials and evaluations on technology tools for the classroom and examples of how they could be used using TPCK.

Introduction

The goal when this project first started was to simply create several video tutorials of tools that would be beneficial in the classroom. It quickly evolved into something much deeper. After examining the research, it became apparent that it was much more valuable to focus on how to integrate technology in the classroom effectively. The effective integration of technology is accomplished through balancing a teacher's knowledge of pedagogy, content, and last but not least technology. As a teacher, the problem with effectively integrating technology isn't not knowing any one of the three areas, but more generally not knowing how to fit them together meaningfully. This project seeks to change this predicament and demonstrate effective uses of technology that fit within the Technological Pedagogical Content Knowledge (TPCK) scope (Koehler & Mishra, 2008).

What is TPCK?

To first really understand TPCK (Technological Pedagogical Content Knowledge) *see graphic 1* there must be a solid foundation of knowledge for each individual component. Koehler and Mishra (2008) explained it well saying content knowledge is knowledge about the actual subject matter that is to be learned or taught. This could include knowing the ins and outs of grammar for an English class or knowing everything about the periodic table of elements for Chemistry.

While content knowledge is incredibly important, it also is dependent on pedagogical knowledge. As teachers, it is our responsibility to execute and deliver this content knowledge to students. This includes lesson planning, teaching methods, and even classroom management. When we link the content knowledge and the pedagogical knowledge together we create pedagogical content knowledge (PCK). PCK covers the core business of teaching, learning, curriculum, assessment, and reporting (Koehler & Mishra, 2008). In short, this is what educators do every day in the classroom. They transform the content knowledge into material that is learnable and deliver it in ways that makes it easy to understand yet challenging and new.

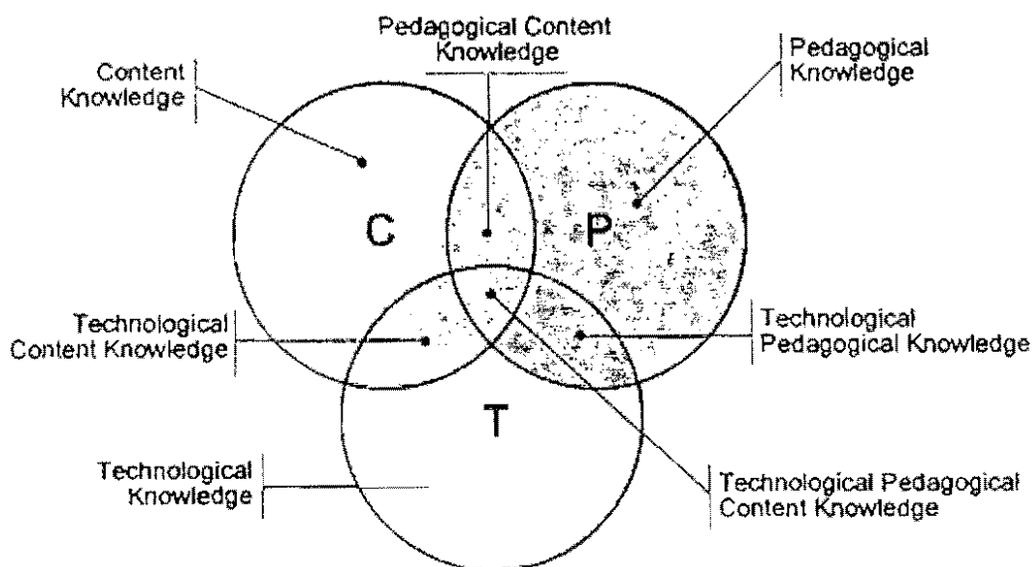
The final part of TPCK is technology. *So what really is technology?* When we think of technology, we tend to think it is electronics like computers, tablets, interactive white boards, and smartphones. That's true, but that's not all technology is. As people and educators, we tend to forget the definition of technology. The definition used by M.A.C.A.D.E.M.Y. school of science and technology in Brooklyn New York states (2013): technology refers to the making, modification, usage, and knowledge of tools, machines, techniques, crafts, systems, and methods of organization, in order to solve a

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problem, improve a preexisting solution to a problem, achieve a goal, handle an applied input/output relation or perform a specific function. It can also refer to the collection of such tools, including machinery, modifications, arrangements and procedures. That is a extremely broad definition. Almost anything we see around us is technology; from pencils, to clocks, and yes our computers. Making this clear helps make tackling technology integration a little easier because we already do it all the time. When you teach a kindergartener how to write the alphabet with a pencil you are using TPCK, or when you teach a second grader how to tell time using a clock you are using TPCK.

After examining the role of TPCK in technology integration, the purpose of the project changed. The main goal of the project then became to use TPCK to educate pre-service and current teachers about different technologies available. As well as, also giving them meaningful examples of lessons and activities that integrate the technology that also use TPCK.

Graphic 1



Why is it Important?

Knowing how to integrate technology effectively into the classroom is incredibly important. As pointed out by Koehler and Mishra (2008), teachers are the people "with the power to significantly influence the appropriate (or inappropriate) integration of technology in teaching"(p. 3). One of the big reasons TPACK is important is in the hopes to overcome problems such as functional fixedness, and surface level use of technology while also emphasizing the importance to be life-long learners.

The first danger is of functional fixedness. Functional fixedness is the idea that an individual technology can only have one purpose (Koehler and Mishra, 2008). An example could be as simple as using pencils only for writing when they could also be used for sketching, drawing, or even sticks for building. Another example would be the Inklewriter tool, featured in one of my tutorials, on the surface it is a great program to write interactive stories, but it can also be used as a form for sequencing, or displaying main ideas and supporting details. Although different technologies have different affordances as well as things they can't do, it's important to be able to see all the possibilities and not limit each tool or technology to one specific use. Having a deep understanding of pedagogy and being able to understand how to teach and reach your students, as well as having a good grasp on technology are key to overcoming functional fixedness.

It is also important to be aware of surface level integration. This prevents the technology from making meaningful impacts and from teaching other content. Surface integration. While technology education is important, students need to learn how to use

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the tool like word processors, PowerPoint, or any other tool, whereas learning how to use the tool is not technology integration. It is important to move away from treating technology as its own separate subject but as a tool to further growth and learning for all information. It takes a balance of not only knowing how the technology works but also how the technology can be used to teach (pedagogy) as well as a knowledge of the information you want to teach (content).

The final caution is that technology integration requires the teacher to become a life-long learner. Digital technology is always changing, upgrading, and is not fixed. This creates a barrier for technology integration (Koehler and Mishra, 2008). It is a well-known fact that a teacher needs to be a life-long learner, it's one of the things that drew me to the profession. With technological integration and TPCK, this fact isn't any different. It is important that educators be constantly learning to improve and "update" their technological knowledge, along with their pedagogical knowledge and sometimes content knowledge. Without the most recent information and knowledge it becomes difficult, if not impossible, to meaningfully integrate technologies that are constantly changing.

Technology is changing education and how students learn. Having teachers that can help students develop the skills while also meaningfully integrating subject areas such as ELA (English Language Arts), Sciences, Social Studies, Math, and Art and all subjects can make a consequential impact on student growth and learning now and infinitely in the future. A great example is in ELA. According to Schmidt and Gurbo (2008), "students who access information on the Internet use different decoding and reading strategies" For teachers this means they "must determine how technology changes the way literacy is taught"(Schmidt & Gurbo, 2008, p. 67). In a world of

hyperlinks and point and click media, the way we find and understand information is also changing making it imperative that students learn and utilize the skills of decoding and understanding information.

While there is a myriad of information and statistics showing the benefits of technology integration, this project focused on the importance of using TPCK for meaningful technology integration. It is exceptionally important that teachers utilize their technological knowledge of the tools, their pedagogical knowledge of how to deliver and teach the information, and also their content knowledge in order to overcome and prevent the problems that can occur with technology integration by balancing the three areas.

The Methodology

Now that the research base is set we can examine more closely the process for the videos. The first step in the process was the tool selection process. In order to find technologies to demonstrate, explain and evaluate I mostly scoured the web. I wanted to find tools and technologies that teachers were already using and recommending so that I could use this as an opportunity to "spread the word" of all the great up and coming apps, programs, and websites out there. I found some of the tools, such as Inklewriter and Youngzine, on the American Association of School Librarians (AASL) "List of Best Websites for Teaching & Learning" (2013). I also found Levelbook and Popplet on Scholastic's "My 35 Favorite Free Apps for Teaching" (2012). The rest of the apps and websites were found on teacher blogs, and through discussions with current teachers.

The next two steps were getting familiar with the tool and creating the tutorial video. I spent hours on each tool clicking every button, reading tutorials myself, and just

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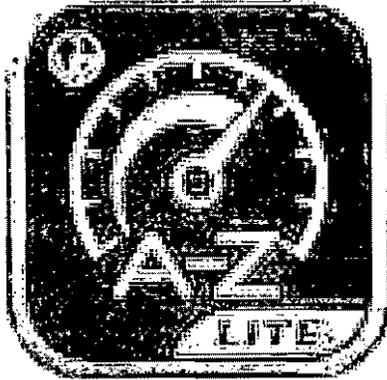
overall familiarizing myself with the tool until I felt comfortable with it. I would even test the tools several times. I created many stories with Inklewriter, I would pretend to read books to practice Levelbook, I created and deleted a few classes and students for Glogster, and I repeated this with each tool I created a video for. Once I felt comfortable with the app I began creating my tutorials. I created the videos using screenshots that were placed into a PowerPoint that I then narrated.

The final step was the evaluation. Evaluation was broken into 3 main categories: accessibility, usability, and grade level. Accessibility was mainly assessing the ease of acquiring the tool, how expensive was the tool, and what platforms could use the tool. In short, how easy was this tool to get into the classroom? *Is it simple to get or are there many road blocks?* I was able to get most of this information by looking around the developers' websites. The next criteria usability is calculating how easy the technology is to navigate, and how easy it is to incorporate. Navigation is looking at if the tool is user friendly and if someone with limited knowledge of the device can get around on the website or app easily. Ease of incorporation is where pedagogical knowledge really shines. It looks to evaluate if a teacher can use his or her content knowledge, technological knowledge, and pedagogical knowledge in order to effortlessly incorporate the tool into the classroom and content. The final marker was grade level. This was a quick measurement of what age group the website or app would be most appropriate and beneficial to use. With the evaluation portion finished, I was able to complete the videos and post the finished project.

The Tutorials and Evaluations

Name of Tool: Levelbook

Photo of Tool logo:



Location of Tool: Levelbook by Von Bruno in the App Store

Key Features and Benefits:

- It keeps all of your classroom data in one place
- It quickly allows you to see which students are struggling
- It allows you to set goals
- It allows you to leave notes for what each student needs to work on

Hyperlink to Tutorial:

Evaluation of Tool:

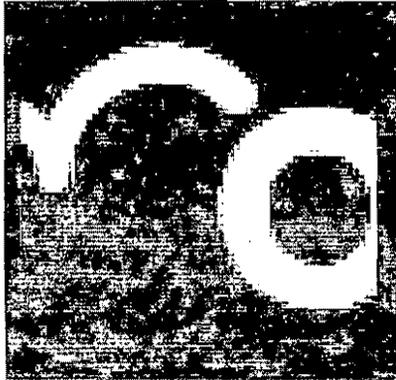
- ⊙ Accessibility
 - > Easy to get- It's really easy to get all you have to do is download it from the Apple app store.
 - > Cost- The app has a free version but that only allows for 10 students. The other version is \$4.99 and it allows an unlimited number of students.
- ⊙ Platforms- This tool is for the iPhone or iPad. It is only compatible with apple products.
- ⊙ Usability

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- > Ease of Navigation- The app is very easy to navigate, and intuitive. With commands like flag error, self correct, etc. the user only needs to tap the command that they want.
 - > Ease to Incorporate- This is a teacher tool and it would be very easy to incorporate because it is just a simpler and quicker way to keep track of data that teachers are already collecting.
- ◎ Grade Level
- > This tool would work for any grade level where teachers are still using running records.

Name of Tool: Movenote

Photo of Tool logo:



Location of Tool: Movenote in the App Store or Android Market or

<http://www.movenote.com/>

Key Features and Benefits:

- You can narrate photos or presentations
- You can add photos or you can import slides or photos from apps such a Google Drive
- It allows you to make presentations more personal and add emotion
- It creates PDF handouts of your slides so that you can print them for note taking

Hyperlink to Tutorial:

<https://www.youtube.com/watch?v=mmYnJHXpsMA&feature=youtu.be>

Evaluation of Tool:

- ⊙ Accessibility
 - > Easy to get- It's really easy to get to you simply type in the website, or download it from App Store or Google Play
 - > Cost- It depends on which platform you are using. For both the computer and on the android devices the program is free. However, the app costs \$2.99 in the App Store for apple devices.
 - > Platforms- This tool is for the Computer (PC/MAC) and also for tablets and mobile devices (Android/Apple).

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⊙ Usability

- > Ease of Navigation- The website and the app version of this program are both very easy to navigate. It is very instinctive with commands and all of the features are easy to learn quickly.
- > Ease to Incorporate- This would be very easy to incorporate into the classroom. It lends itself well to distant learning but also could easily be used to introduce and create projects, for snow day work, and/or for homework and work outside of class.

⊙ Grade Level

- > I think that this tool could work with any grade level just by changing the content and delivery method. The main problem is going to be keeping younger students' attention in the lecture style of the app. While it would work with any level, it caters more easily to higher grade levels.

Name of Tool: Inklewriter

Photo of Tool logo:



Location of Tool: <http://www.inklestudios.com/inklewriter/>

Key Features and Benefits:

- Student can use the website for plot building and sequencing
- It encourages student writing in a fun and unique way
- It provides a fun and differentiated approach to learning
- It encourages students creativity

Hyperlink to Tutorials:

<https://www.youtube.com/watch?v=2J40nzGfX2U&list=UUYxXBu3EOLQkHDKHUoXpexA>

Evaluation of Tool:

⦿ Accessibility

- > Easy to get- It's really easy to get to you simply type in the website, and set up an account.
- > Cost- The website it completely free.
- > Platforms- This tool is for the Computer (PC/MAC).

⦿ Usability

- > Ease of Navigation- This website can be very complicated. It has a lot of features like loops or jumps in the storyline. These controls can be very difficult but after about an hour you can master the basic controls the more complex designs will just take time.

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- > Ease to Incorporate- Inklewriter is a creative way to give students writing assignments and prompts that they can have fun with. It can also be used for brainstorming, and for plot sequencing. It lends itself to other subjects such as science as well with cause and effect relationships. i.e. If I heat this chemical up then _____ will happen or if I cool this chemical _____ will happen.

⊙ Grade Level

- > I think that this tool could work with any grade level just by changing the features used and levels of support. With younger students, the teacher is going to want to provide more support and limit the use of features, but with older students the teacher can loosen the reins and let students' creativity soar.

Name of Tool: Glogster

Photo of Tool logo:



Location of Tool: <http://edu.glogster.com/>

Key Features and Benefits:

- You can create online projects, lesson, etc.
- You have complete control over your students' accounts
- It provides a fun and differentiated approach to learning
- It allows you to monitor your students' progress at any point not just when the project is finished
- It encourages students' creativity

Hyperlink to Tutorials:

Tutorial 1: <https://www.youtube.com/watch?v=st8XI6OrTpo&feature=youtu.be>

Tutorial 2: <https://www.youtube.com/watch?v=8xxk4wfCkEw&feature=youtu.be>

Evaluation of Tool:

⊙ Accessibility

- > Easy to get- It's really easy to get to you simply type in the website, and set up an account.
- > Cost- It depends, it can cost a lot. The programs start at \$39 a year for a single teacher with 30 students. Teachers can purchase additional student licenses for a fee. The entire school can also join the program and have a specific plan created for them.
- > Platforms- This tool is for the Computer (PC/MAC).

⊙ Usability

- > Ease of Navigation- This website is really hard to get the used to. After working with the site for a few hours it does get easier, and eventually

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habitual. It would require some teaching with students on how to use the tool.

- > Ease to Incorporate-Glogster is fun and could lead to some creative projects and activities. The potential of what you can do with your class are pretty limitless with the video, picture, and text tools.

⊙ Grade Level

- > I think that this tool could work with any grade level just by changing the content and with varying levels of support.

Name of Tool: FlipSnack^{edu}

Photo of Tool logo:



Location of Tool: <http://www.flipsnack.com/edu.html>

Key Features and Benefits:

- You can create online assignments and realistic books.
- You have complete control over privacy settings.
- It allows the teacher to choose what specifically goes into the books.
- It is fun for students because it behaves like a real book.
- It encourages students creativity by allowing them to create their own books.

Hyperlink to Tutorial:

<https://www.youtube.com/watch?v=JtWy5ud7D44&list=UUYxXBu3EOLQkHDKHUoXpcxA>

Evaluation of Tool:

⊙ Accessibility

- > Easy to get- It's really easy to get to you simply type in the website, and set up an account.
- > Cost- It depends, it could be free or it can cost a lot. The programs has a free option for 1 teacher and 10 students. Teachers can also pay \$36 a month or \$96 a year for 1 teach with 30 students. Teachers can purchase additional student licenses for a fee of \$2. The entire school can also join the program and have a specific plan created for them.
- > Platforms- This tool is for the Computer (PC/MAC).

⊙ Usability

- > Ease of Navigation- This website is very easy to navigate and uses intuitive commands and options.

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- › Ease to Incorporate- FlipSnack is a creative tool that could lead many projects and activities. It could be especially helpful when trying to introduce a topic. While this tool only creates books, the teacher or student can create the books on any topic and display it in multiple ways.
- ⦿ Grade Level
 - › I think that this tool could work with any grade level just by changing the content and with varying levels of support. At a first grade level, the teacher may want to create a book to read to the class but at a tenth grade level the teacher may give students a topic and let them create their own books.

Name of Tool: Popplet

Photo of Tool logo:



Location of Tool: <http://popplet.com/>

Key Features and Benefits:

- It allows students a cleaner way to brainstorm.
- It has complete freedom of layouts and simple personalization in design.
- Inexpensive compared to competitors, i.e. OmniGraffle which is \$49.99.

Hyperlink to Tutorial:

<https://www.youtube.com/watch?v=fHq5va23hZU&feature=youtu.be>

Evaluation of Tool:

⊙ Accessibility

- › Easy to get- It's really easy to get to you simply type in the website, and set up an account, or locate it in the app store and download it.
- › Cost- It depends, it could be free or you could pay for it. The free version on the computer and iPad allow the user to have up to five maps or popplets at the same time. After the user has five they must delete an older one in order to make space for a new one. If you want an unlimited number of popplets at one time the cost is \$4.99 on the iPad and either \$3/month or \$30/year for the computer.
- › Platforms- This tool is for the Computer (PC/MAC), and on the Apple iPad.

⊙ Usability

- › Ease of Navigation- This website is very easy to navigate and uses intuitive commands and options.

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- > Ease to Incorporate- Popplet can be used for a wide range of things, including brainstorming, comparing and contrasting, and concept mapping. These are all skills used often in the classroom especially in English Language Arts and in Science.

⊙ Grade Level

- > This tool could work with any grade level but caters towards the younger grades. Older students could use this for quick brainstorming or mind-mapping activities, but younger students could really delve into the program and utilize it in the writing process as well as a tool for learning.

Name of Tool: Youngzine

Photo of Tool logo:



Location of Tool: <http://www.youngzine.org/>

Key Features and Benefits:

- This site allows you to pull current events and what is happening right now in the world around us into the classroom.
- The website appears to have a very unbiased tone when presenting information.
- It provides students with the opportunity to research and write their own piece on the site.
- It encourages students to react and respond to what they read and learn.

Hyperlink to Tutorials:

<https://www.youtube.com/watch?v=3vmHsIrrALE&list=UUYxXBU3EOLQkHDKHUoXpcxA&index=5>

Evaluation of Tool:

⊙ Accessibility

- › Easy to get- It's really easy to get all you have to do is go to the website where you can then set up an account
- › Cost- This website and all of its features are completely free.
- › Platforms- This tool is for the Computer (PC/MAC).

⊙ Usability

- › Ease of Navigation- This website is really easy to navigate. You select the section, type of news events, that you want and then you simply select the article you want from the list. It is really straight and to the point.

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- › Ease to Incorporate- Youngzine has a lot of possible uses in the classroom. There is opportunity to teach Social Studies with current event articles at the students levels, and history games. There is the possibility of using the website for science with the science section talking about new discoveries and findings. There is also the opportunity to teach ELA (English Language Arts) by giving the students the chance to read and respond to the articles while also giving them the opportunity to write and create their own.

◎ Grade Level

- › I think that this tool could work for various grade levels. For a younger grade level, I would find something I wanted to read to the class and respond to as a whole group or in small groups. The teacher would be able to give the students more freedom and allow them to read, respond, and even write their own pieces more independently at the higher grade levels.

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