RUNNING HEAD: PLN Technology Integration

THE USE OF PROFESSIONAL LEARNING NETWORKS AND TECHNOLOGY INTEGRATION

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ABSTRACT

This study was designed to explore the connection between the use of a professional learning network and technology integration. Technology integration in the classroom is a rapidly evolving subject, and the traditional methods of professional development in this area may not meet the needs of educators. Using social media services, in the form of a professional learning network, to dialogue and stay informed about technology integration may be an area of meaningful professional development. A survey was administered to educators of various grade levels and subject areas to determine if using a professional learning network enhances the integration of technology in a classroom. After analyzing the data, there was no statistical difference found between teachers who use a professional learning network and teachers who do not. However, there may be other benefits to using a professional learning network.
INTRODUCTION

Background, Issues and Concerns

In the field of education, best practices are a cornerstone of an effective teacher. Normally, teachers have the opportunity to learn about these practices during in service training or annual conferences. In the area of technology integration, these best practices are developed and evolve quickly, necessitating the need for teachers to learn about them on a regular basis. It may be the case that the conference or in service may not provide the ‘in time’ training teachers need to keep up with these best practices. Another area of concern is the motivation of teachers to integrate technology in their classroom. Many educators utilize research based practices without technology and have success in the classroom. A professional learning network might motivate teachers to integrate technology because they are seeing their peers try. Instead of being lectured by a stranger during a professional development session, a professional learning network might provide teachers a personal connection with their peers that will influence them more than the traditional methods of professional development.

Practice under Investigation

The practice under investigation is the use of a professional learning network to increase teacher awareness and use of best practices in regards to technology integration. This was measured by surveying teachers utilizing a professional learning network as well as teachers who are not. Their level of technology integration was measured using the SAMR model.

School Policy to be Informed by Study

Ongoing teacher training may be vital to student success. This study explored the
avenue of professional learning networks as another opportunity for teacher training. By using a PLN, teachers can take advantage of the synchronous and asynchronous training that may be needed to stay current on these best practices, especially in the areas of technology integration.

*Conceptual Underpinning*

Best practices are researched based and classroom proven methods that help students achieve. Educators need the opportunity to research and implement these best practices in their classroom. Unfortunately, the current model of professional development may not support the need of educators, specifically in the area of technology integration. A PLN provides educators with a resource to connect with educators who are currently developing, utilizing, and refining best practices, including best practices of technology integration in real time. Ultimately, this professional development may increase the use of best practices by educators, and therefore give the educator tools to help their students succeed.

*Statement of the Problem*

The development of technology integration in the classroom is rapid, and teachers need an up to date and readily accessible resource to understand and develop best practices for technology integration. If teachers who use a PLN integrate technology effectively, the use of a PLN should be explored as a valid tool for educator professional development.

*Purpose of the Study*

To find if active use of a PLN contributes to integration of technology.
Research Question

RQ#1: Is there a significant difference between the use or non-use of a professional learning network in relation to integration of technology as measured by the SAMR model?

Null Hypothesis

There is no significant difference between the use or non-use of a PLN and integration of technology as measured by the SAMR model.

Anticipated Benefits of the Study

If there is a significant difference, teachers will have a best practice resource for integrating technology in the classroom in the form of a PLN. Teachers will also have an opportunity to provide advice and guidance based on their best practices to other teachers.

Definition of Terms

A PLN is an acronym for professional learning network. It is a network a teacher creates using various social media services. This network is curated by the educator with experts the teacher can use as resources for best practices for their content areas or instructional needs.

The SAMR model is a method for teachers to use when integrating technology into their classroom. This method will be used to measure teacher’s integration of technology. The model features four levels: Substitution, Augmentation, Modification, and Redefinition. The ‘substitute’ and ‘augment’ levels are considered lower level, and the ‘modification’ and ‘redefinition’ are considered higher level integration.
Summary

The use of best practices in education can help students achieve in the classroom. In order to use these best practices, teachers need opportunities to research and refine these practices for their unique classroom setting. A PLN is an opportunity for educators to curate their own professional development to the degree of getting information they need exactly when they need it.
REVIEW OF LITERATURE

The conceptual underpinnings for teacher professional development have relied on teachers experiencing quality professional development. Citing this need, Darling-Hammond (2011) stated “Beginning with pre-service education and continuing throughout a teacher’s career, teacher development must focus on deepening teachers’ understanding of the processes of teaching and learning and of the students they teach” (p. 82). Darling-Hammond (2011) further stated “Effective professional development involves teachers as both learners and as teachers and allows them to struggle with the uncertainties that accompany each role.” (p. 82). In our technologically connected world, these professional development opportunities can expand beyond our normal school day. School districts should be open to adopting new forms of professional development, even if these forms take place informally and outside of the normal school day (Darling-Hammond and McLaughlin, 2011, p. 85).

In the spirit of seeking new avenues for professional development, educators can turn to a professional learning network (PLN). A PLN is defined as “…part of a self contained, password-protected school wide effort or a mixed bag of social networking and bookmarking sites such as Edmodo, Twitter, Diigo and Delicious.” (Flaningan, 2012, p. 43). Essentially, a PLN is a hallmark of a connected teacher; one who reaches outside their classroom, outside their school and outside their community to connect with educators for the purpose of improving their teaching and student’s achievement. Trust (2012) defines a PLN in two ways: an information aggregation system and a set of social media connections. The former is defined as a “type of PLN (that) allows teachers to stay up to new information by following multiple Web sites and news sources through
RSS (Really Simple Syndication) feeds, blogs.” and the latter “…refers to teachers’ use of social media to connect with various individuals around the world.” (p. 133). Furthermore, a PLN “…gives rise to a more bottom-up organization of learning where workers with their peers interact about their work experiences through sharing their practice, knowledge and contacts” (Hanraets, et. al., 2011, p. 85) This connectivity is a positive development in teacher professional development. In light of this, Flaningan (2012) stated “As budget cuts limit district level training opportunities, PLN’s take a grassroots approach to professional development. Administrators and teachers say such networks reduce isolation, promote autonomy, and provide inspiration by offering access to support and information not only within a school but also around the globe” (p. 42). Additional benefits of a PLN include the opportunities to share and collaborate with other educators. Citing this benefit, Hanraets et. al. (2011) state “Innovative teacher professional development should involve opportunities for teachers to share their practice, learn from peers, and collaborate on real-world projects” (p. 87). Veletsianos (2012) further supports the creation of a PLN citing these benefits: The ability to share information, media, and other resources; Asking for and providing assistance to others and networking with others, while also acting as connectors between individuals. (p. 342)

A PLN offers a plethora of benefits for an educator. Cakir (2012) cites the fact “If faculty introduced these strategies into graduate courses or faculty development, professionals could dialogue continuously with new and current colleagues rather than waiting for annual conferences and facing enduring isolation” (p. 44). Learning in real time is something that all educators should be open to experiencing. A PLN may also be beneficial for educators to create a sustained collaborative dialogue with other educators.
Research on this benefit states “… in exchange for their participation and knowledge sharing, networked learners expect to receive feedback from other participants in the network” (Sie, et. al., 2013, p. 70) This collaboration may be an important tool to teacher professional development, and a PLN can be a part of that development. In a study done on educators developing technology based curriculum, Herro et. al. (2013) found “Opportunities to partner, build, and test curricular units with mobile devices would assist faculty as well as in-service and pre-service teachers.” (p. 37). A PLN could easily be the opportunity to partner Herro et. al. (2013) mentioned. A PLN also offers educators an avenue to share what they are using and excited about in their classrooms. In a study done surveying teachers who use a PLN, Veletsianos found “…participants in this sample shared information relating to new technological tools or developments that they seemed to find interesting or worthwhile. (p. 343).

Hertz (2011) defines effective technology integration as “…technology is not taught as a separate class, but integrated into the classroom. It also means that students use technology to learn content and show their understanding of content, not just their expertise with a tool.” Effective technology integration is further defined using the SAMR model. The SAMR model was developed by Dr. Ruben R. Puentedura in order to give a frame of reference to effective technology integration. SAMR is an acronym for substitution, augmentation, modification and redefinition. Essentially, “The SAMR model links how you use technology to the outcomes for students” (Puentedura, 2013). The following chart defines the SAMR model:
The pedagogical benefits of integrating technology are numerous. Not only are they numerous, they are imminent. In support of this, research shows “As many U.S. youth already own mobiles and BYOD programs are growing in popularity, these researchers believe the hyper connected, affordable, global access that users demand will disrupt schools, shifting them from a ‘we teach’ approach to an ‘I learn’ environment.” (Herro, et. al., 2013, p. 31). Examples of this learning can be found in research done during a technology integration pilot program:

First grade classes read interactive books created digital stories using an app
relying on images, sound and text. In one class, students read folktales such as The Three Little Pigs (Nosy Crow, 2011), already downloaded on the iPod touches. Next, they used the StoryKit app (ICDL Foundation, 2011) to recreate their own folktales. Its interactive template allowed them to write, audio narrate, and upload pictures. Projecting the devices or passing them among classmates facilitated easy story sharing (Herro et. al., 2013, 32).

Herro et. al. (2013) further states “The success with ARIS and mobile learning resulted in additional learning opportunities. Students connected with a local museum to create and ARIS game for visitors to learn about exhibits, extending the understanding and relevance of games to the broader community” (p. 44). As supported by Veletsianos (2012), educators can also take advantage of technology integration by providing a worldwide authentic audience for their students, stating “The findings also indicate that a number of scholars network in order to enhance their teaching by seeking input, sharing their work, engaging in conversation with others, and sharing student work” (p. 346). Furthermore, Veletsianos (2012) states “We see here a new role for the instructor as an active network participant who connects students with his/her professional community (ibid).

In summary, educator professional development is an essential aspect of a successful educator. The development of a PLN offers educators an up to date resource for best practices in education, including technology integration.
RESEARCH METHODS

Research Design

A survey was developed surveying educators who are and are not users of a PLN. The survey will establish what levels the educators are currently implementing technology in their classroom. The independent variable in this study is the use or non-use of a PLN. The dependent variable in this study is the level of technology integration according to the SAMR model.

Study Group Description

The study group included educators who use and who do not use PLN. These educators have a diverse background, among them: Classroom teachers, administrators, and technology coaches from urban and suburban school districts.

Data Collection and Instrumentation

A survey was used to gather data referencing the level of technology integration as well as the availability and reliability of technology available to the respondents. This survey was administered using Google Forms.

Statistical Analysis Methods

The data was analyzed using descriptive analysis and a t-test statistical analysis. Each survey response was coded to a number according to the SAMR model: Substitution was given the value of 1, Augmentation the value of 2, Modification the value of 3, and Redefinition the value of 4.
FINDINGS

A t-test was administered to discern the difference of technology integration between PLN users and non-users. The follow table and charts will demonstrate the survey data and that were collected. Each level of integration was coded to a number value: substitution was assigned the value of 1, augmentation the value of 2, modification the value of 3, and redefinition the value of 4.

Figure 1

T-test Analysis Results of Survey Data

<table>
<thead>
<tr>
<th>Source</th>
<th>Mean</th>
<th>Mean D</th>
<th>t-Test</th>
<th>df</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Users of a PLN</td>
<td>2.56</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-users of a PLN</td>
<td>2.19</td>
<td>.37</td>
<td>1.38</td>
<td>56</td>
<td>.17</td>
</tr>
</tbody>
</table>

Note: Significant when p<=.10

The data was collected from 59 responses from professional educators who were as asked a series of questions in regards to technology integration. After receiving their responses, they were separated into two groups: PLN users and non-users. 37 survey responders identified as active users of a PLN, and 22 identified as non-users of a PLN. Then, the level of integration they answered was coded to a number value. Those values were then run through a t-test to determine if there was a statistical difference in technology integration between PLN users and non-users. The mean value of integration for users of PLN was 2.56, and the mean of non-users was 2.19. The difference between the two groups was .37. The t-test yielded a result of 1.38 and the df was 56. The p-value of this t-test was .17, which is higher than the alpha level of .10. Since the p-value is higher the alpha level, the null hypothesis cannot be rejected.
Figure 2

Max, Min and Median Values of Technology Integration

The maximum value of technology indicated by PLN users was 4 (Redefinition). The non-users of a PLN also stated a value of 4 (Redefinition). The minimum value of technology integration was 1 (Substitution) among both PLN users and non-users. The median value of users and non-users was 2 (Augmentation). The maximum, minimum, and median values were identical between PLN users and non-users.
The mean of integration between PLN users was 2.57. The mean of integration of non-users was 2.19. The difference between the mean of PLN users and non-users is .36. PLN users showed a higher mean of technology integration than non-users.
The standard deviation of PLN users was 1.01. The standard deviation of non-users was 0.98. The difference between users and non users is 0.08. Both the users of a PLN and non-users had a similar standard deviation.

The survey asked responders to rate the availability and reliability of technology at their school, responding to the question “My school or workplace has readily available
and reliable technology resources on a consistent basis.” The respondents were offered a Likert scale of one to five. One was coded as “strongly disagree” and five was coded as “strongly agree”. In the survey responses: ten respondents identified as integrating at the substitute level, 25 identified as integrating at the augmentation level, eleven identified as integrating at the modification level, and 11 identified as the redefinition level. The mean of both the substitute and augmentation group was 3.4. The mean of the modification group was 3.81. The mean of the redefinition group was 3.92.

This research was compiled to answer the research question “Is there a significant relationship between the use of a professional learning network and the integration of technology as measured by the SAMR model?” According to the results of the survey, the null hypothesis could not be rejected.

The minimum, maximum, and median values of technology integration were all identical for PLN users and non-users. There was a difference in the mean value of integration between the two groups: The users of a PLN reported a higher mean on integration than non-users. The standard deviation between the two groups was very similar. The respondents that reported integrating technology at a higher level also reported technology was readily available and reliable in their school or workplace.
CONCLUSIONS AND RECOMMENDATIONS

Professional development in regards to technology integration is an important part of a teacher’s profession. The use of professional learning network was explored in this study to determine is a PLN could be used as a source of professional development. There was no statistical difference on technology integration between PLN users and non-users. The alpha level of the t-test was 0.17, great than the p-value of 0.10. No group more effectively integrated technology than the other according to the SAMR model. The relatively small sample size of this survey may not present a complete picture of the educational landscape; however the data does provide some interesting points.

The median scores of two for each group were at the Augmentation level in the SAMR model, not at the basic Substitution level. This might show an inclination of educators to start integrating technology in their classroom in a meaningful and seamless way. The users of a PLN had a higher mean of technology integration. This may support the use of a PLN as a part of a teacher’s professional development. This data also yields some possibilities for further study.

Further studies might explore the motivation and support a PLN could provide for an educator. Instead of measuring the level of technology integration, a study could be formed to measure the confidence and willingness of teachers to try new techniques in their classroom by learning best practices from their peers. A PLN may provide a support network for educators to gather the expertise and encouragement to try new technologies or integration best practices in their classroom. Another study could be done surveying educators regarding the reasons why they use a PLN, and those results could be examined and compared to the gaps in educator professional development a
PLN might be able to fill.

Another interesting aspect of the data collected was that survey respondents who reported higher levels of integration also reported having access to reliable technology in their school building. Some of the surveys’ respondents may have reported lower levels of integration simply because that’s the level that their school’s technological infrastructure allowed. Conversely, those that reported higher levels of integration may have direct and reliable access to technology in their building.

A PLN may be a practice for teachers to consider augmenting their professional development. While the data did not show a statistical difference in integration, users may receive other benefits from using a PLN. Maintaining a professional and informed opinion on best practices and trends in technology integration might be a benefit from using a PLN. The immerse nature of a PLN may provide teachers a chance to take ownership in their professional development outside of the traditional in-services and conferences. Overall, a PLN is a professional development tool whose benefits continue to be explored and might yield benefits for educators.
REFERENCES


APPENDIX

PLN and Technology Integration Survey

Do you use a professional learning network?
Defined as sharing and finding educational resources through the use of social media, as well using using social media to connect with other education professionals.

☐ Yes
☐ No

Please select the highest level in which you currently integrate technology in your classroom.

☐ Substitution- Students print out worksheets and pass them in. There may well be times when this the appropriate level of work as there is no real gain to be had from computer technology.

☐ Augmentation- Students take a quiz on Google Forms instead of pen and paper. There is some functional benefit here in that paper is being saved, students and teacher can receive almost immediate feedback on student level of understanding of material.

☐ Modification- Students write an essay and prepare and audio recording and musical soundtrack to be played before an authentic audience. Computer technology is necessary for this classroom to function allowing peer and teacher feedback, easy rewriting, and audio recording.

☐ Redefinition- A classroom is asked to create a documentary video answering an essential question related to important concepts. At this level, common classroom tasks and computer technology exist not as ends but as supports for student centered learning.

My school or workplace has readily available and reliable technology resources on a consistent basis.

1 2 3 4 5

Completely Disagree ☐ ☐ ☐ ☐ Completely Agree

Submit

Never submit passwords through Google Forms.