

The West Texas Middle School Math Partnership (WTMSMP)

Report of Teachers' Technology Use

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To facilitate the conceptual understanding of WTMSMP content and to provide support to educators as they implement new knowledge and skills into diverse classroom environments, the WTMSMP will create a virtual community of middle-level mathematics education professionals. The first objective in meeting this goal is to select project content, resources, and support for online access, which will be achieved through the completion of five activities. Results from the first two activities are described in the present report.

Activity 1 – Create a survey of teachers' professional and social use of technology.

A survey of teachers' professional and social use of technology was developed to evaluate how participants use technology in their work and leisure. Obstacles to the use of technology were also of interest as well as preferences based on teaching experience. Finally, the survey allowed participants to identify familiar technology and technology that they would like to use in the project. Refer to Appendix A to view the survey.

The survey was made available to participants in May, 2009 through an e-mail announcement that read:

In order to better understand your comfort level with technology and to use/make the most of it during our summer courses, we are asking that you go to this address: <http://www.wtmsmp.math.ttu.edu/TechnologySurvey.htm> and complete the survey. It will take around 10-15 minutes of your time, so please fill it out as soon as possible.

Research has supported that ownership and autonomy in online learning are necessary factors in facilitating the development of a learning community. The survey was an initial step in conveying to participants that the online community would be developed based on their input, interest, and comfort with technology. Thus, the WTMSMP is working to design a virtual community structure using familiar technology and technology of interest and value to participants.

Activity 2—Describe and analyze participants' professional and social use of technology.

A total of 64 participants completed the survey in its entirety without omissions. Half of the participants (n=32) described their school setting as urban and half described their school setting as rural. The average age of participants was 39.22 (SD=8.75), and the average number of years teaching was 10.80 (SD=7.62). All participants endorsed that they used the computer and Internet in their work and all participants reported that they used the computer, Internet, or both in their leisure time at home. Almost 55% of participants (n=35) acknowledged that a wireless Internet was available at their school, whereas 64.1% (n=41) reported that they had wireless access to the Internet at home. These results indicate that the participants regularly have access to the Internet and regularly use their computers and Internet connections in their work and leisure.

In addition to using the computer and Internet at work, 7 participants (10.9%) reported using an mp3 player, 2 (3.1%) reported using Facebook, 1 (1.6%) reported using My Space, 1 reported using another social networking tool (1.6%), 12 (18.8%) reported using forums, 3 (4.7%) reported using blogs, 2 (3.1%) reported using wikis, 4 (6.3%) reported using podcasts, 7 (10.9%) reported using instant messaging, 6 (9.4%) reported using video conferencing, and 3 (4.7%) reported using a collaborative document sharing and editing program.

In addition to using the computer and Internet at home and for leisure, 33 (51.6%) reported using an mp3 player, 29 (45.3%) reported using Facebook, 5 (7.8%) reported using forums, 13 (20.3%) reported using My Space, 1 (1.6%) reported using LinkedIn, 1 reported using another social networking tool (1.6%), 9 (14.1%) reported using blogs, 2 (3.1%) reported using wikis, 7 (10.9%) reported using podcasts, 16 (25%) reported using instant messaging, 5 (7.8%) reported using video conferencing, and 1 (1.6%) reported using a collaborative document sharing and editing program.

Location as Obstacle: Differences between Urban and Rural Teachers

Urban and rural teachers did not differ in their familiarity and extent of use of various types of technology (e.g., blogs, mp3 players, forums, social networking, etc.); however, urban teachers reported that the extent to which they used their computer and Internet was greater than that reported by rural teachers, and this difference was statistically significant ($t(62) = 2.36, p = .02$ and $t(62) = 2.22, p = .03$). Greater variability in responses was observed in the group of rural teachers, which suggests that rural teachers' extent of Internet and computer use varied more than it did for urban teachers. Urban teachers' greater use of the computer and Internet may be related to their proximity to colleagues, administrators, and parents within their district. That is, in some rural schools, teachers may experience more opportunities for personal contact with colleagues, administrators, and parents due to the size of their schools, district, and community in comparison to urban teachers who find themselves at greater distances from other campuses within their districts. Refer to Table 1 in Appendix B for a complete review of mean scores and standard deviations.

Network as Obstacle: Differences between Teachers with and without Wireless

Teachers with access to a wireless network at school did not significantly differ in their use of the computer, Internet, or other technology in comparison to teachers without access to a wireless network at school. Teachers with access to a wireless network could have greater technological resources available to their students (e.g., wireless laptops); however, their personal use of technology in the work environment does not seem to be adversely affected by this limitation. Refer to Table 2 in Appendix B for a complete review of mean scores and standard deviations.

Technology Preferences Based on Experience

A review of bivariate correlations between teachers' age and years teaching (see Appendix B, Table 3) revealed the presence of statistically significant negative relationship between age and the use of and familiarity with various technology as well as a statistically significant negative relationship between years teaching and the use of and familiarity with various technology. The strongest associations revealed that the older the teacher, the less likely he/she tended to use iPod technology ($r = -.40, p < .01$), social networks ($r = -.51, p < .01$), and the Internet ($r = -.35, p < .01$). Furthermore, the older the teacher, the less likely he/she acknowledged familiarity with blogs ($r = -.34, p < .01$), wikis ($r = -.35, p <$

.01), and social networking sites ($r = -.36, p < .01$). The reader should observe that the strength of these relationships is moderate, which indicates that the associations are not perfect or even predictive of all teachers' technology use and familiarity. Overall, a negative relationship appears to be the trend, although not all more experienced teachers avoid technology.

Interestingly, the strength of the negative association between familiarity with many types of technology and years of teaching was stronger than that found between familiarity with technology and age. This suggests that years of teaching might be a better predictor of familiarity with technology than age, which implicates the importance of exposure to technology. Those newer to teaching, regardless of their age, likely became familiar with newer technology and its educational uses through their more recent educational experiences. Also, those newer to teaching may have had experience with technology in earlier careers or work experiences.

Teachers' Preferences for Connecting to the Internet/Networking

To assess participants' preferences for connecting to the Internet and networking with others, teachers were asked to identify which tools they would most likely use or would like to learn to use for this purpose. In response, 34 (53.1%) endorsed that they would like to use an iPod, 31 (48.4%) endorsed they would like to use an iPod Touch, 42 (65.6%) endorsed they would like to use an iPhone, 34 (53.1%) endorsed they would like to use another type of smart phone, and 34 (53.1%) endorsed they would like to use a netbook. Participants were asked to select at least one of the aforementioned tools; therefore, the high response rate does not necessarily indicate motivation for using these tools, only a preference.

Teachers' Technology Preferences for Learning

To assess participants' preferences for using certain types of technology for learning in the WTMSMP, teachers were asked to identify which tools they would like to use or learn to use to network and learn in the program. Although only 24 participants (37.5%) endorsed that they want to use the computer and another group of 24 participants (37.5%) reported that they want to use the Internet, 28 (43.8%) endorsed that they would like to use forums, 34 (53.1%) endorsed they would like to use blogs, 27 (42.2%) endorsed they would like to use video conferencing, and 29 (45.3%) endorsed they would like to use collaborative document sharing and editing programs. Additionally, 19 (29.7%) participants reported that they would like to use wikis and 22 (34.4%) reported they would like to use instant messaging. Even though participants were asked to "check all that apply," perhaps they focused on the technology of interest rather than thinking it requires a computer and Internet connection.

Typically, individuals use social networking from a computer and Internet connection; however, increasingly these sites are available via smart phones and netbooks, which sometimes use cell phone technology to connect to the Internet. Therefore, participants might not have been thinking about using a computer and Internet connection when identifying an interest in using social networking sites. Twenty-three (35.9%) participants endorsed they would want to use Facebook and 10 (15.6%) endorsed they would want to use My Space, 6 (9.4%) endorsed they would want to use LinkedIn, and 2 (3.1%) endorsed they would want to use another social networking site. One participant (1.6%) identified Twitter as a social networking site of interest.

Finally, 35 participants (54.7%) reported that they would like to use podcasts to learn. Podcasts can be downloaded to a computer for consumption or to an iPod that syncs to a computer. Additionally, podcasts can be downloaded to iPhones and iPod Touches directly through a wireless connection.

Participants' greater preference for podcasts in comparison to computers and the Internet may reflect an interest in networking through smaller, mobile devices.

Conclusions

Based on the aforementioned results, WTMSMP teacher participants appear to consistently use the computer and Internet in their work and leisure. As expected, those with less exposure to technology (e.g., older participants, those who have not been in school more recently), tend to use the various technological tools less. Although most of the participants do not use technology beyond the computer and Internet at work, almost half of the participants use Facebook for social networking and listen to an mp3 player for leisure at home. In addition, over half (64.1%) reported having wireless access to the Internet at home. A smaller number of participants reported using other technology, such as blogs, forums, video conferencing, instant messaging, and podcasts. Despite the lack of widespread use of these technologies, results indicated that the participants would like to learn how to use these technologies to support their learning in the WTMSMP. Of greatest interest to participants was podcasts followed by blogs, document sharing, forums, video conferencing, instant messaging, and wikis. However, with podcasts endorsed by 54.7% of participants when asked what technology they would like to use to assist with their WTMSMP learning, this tool emerged as having the greatest participant interest (blogs were a close second at 53.1%). Because podcasts can be viewed and listened to on mobile devices, this preference is consistent with participants' lack of endorsement of a preference of using computers and the Internet in their learning. Finally, further consistency was observed in the participants' preference for learning how to use an iPhone. When given a choice, 65.6% of participants reported that they would like to learn how to use an iPhone, which would allow for direct communication as well as podcasting and reading blogs.

Appendix A

West Texas Middle School Math Partnership (WTMSMP) Technology Survey

The purpose of this survey is to establish what types of technology teachers use, to determine what types of technologies would be advantageous for WTMSMP use, and to find out teachers' interests in various technologies. Throughout the survey, you may encounter items that you are not familiar with—this is to be expected. It is not our intention to overwhelm you with unfamiliar terms; rather we wish to make your experience in the program more enjoyable and meaningful through the use of technology.

Demographics

Age: A value is required. Invalid format, an integer is required.

Year(s) Teaching: A value is required. Invalid format, an integer is required.

Grade Level(s) Currently Teaching: 6 7 8 Please make a selection.

Type of School: Rural Urban Please make a selection.

Type of Internet connection available at school:

None Dial Up High Speed Not Sure Please make a selection.

Is Wireless Internet available at school?

Yes No Please make a selection.

Type of Internet connection available at home:

None Dial Up High Speed Not Sure Please make a selection.

Is Wireless Internet available at home?

Yes No Please make a selection.

How Teachers Use Technology Survey

Please select the appropriate box for each of the following items.

To what extent do you use...?	
Computer	<input type="radio"/> Never <input type="radio"/> Sometimes <input type="radio"/> Often <input type="radio"/> Always Please make a selection.
Internet	<input type="radio"/> Never <input type="radio"/> Sometimes <input type="radio"/> Often <input type="radio"/> Always Please make a selection.
iPod/iPod Touch/iPhone	<input type="radio"/> Never <input type="radio"/> Sometimes <input type="radio"/> Often <input type="radio"/> Always Please make a selection.
Other MP3 player (such as Zune, Zen, Sansa, etc.)	<input type="radio"/> Never <input type="radio"/> Sometimes <input type="radio"/> Often <input type="radio"/> Always

- | | |
|--|---|
| <input type="checkbox"/> Internet | <input type="checkbox"/> Wikis |
| <input type="checkbox"/> MP3 Player | <input type="checkbox"/> Podcasts |
| <input type="checkbox"/> Facebook | <input type="checkbox"/> Instant Messaging (including conferences) |
| <input type="checkbox"/> MySpace | <input type="checkbox"/> Video Chats (including conferences) |
| <input type="checkbox"/> LinkedIn | <input type="checkbox"/> Collaborative Document Reviewing/Editing (such as Google Docs) |
| <input type="checkbox"/> Other Social Network
(please name:) <input type="text"/> | |
| <input type="checkbox"/> Online Discussion Boards or Forums | |

You must choose at least one item.

Out of the technologies listed below, which do you find most valuable for leisure (your own time)?

(Check all that apply.)

- | | |
|--|---|
| <input type="checkbox"/> Computer | <input type="checkbox"/> Blogs |
| <input type="checkbox"/> Internet | <input type="checkbox"/> Wikis |
| <input type="checkbox"/> MP3 Player | <input type="checkbox"/> Podcasts |
| <input type="checkbox"/> Facebook | <input type="checkbox"/> Instant Messaging (including conferences) |
| <input type="checkbox"/> MySpace | <input type="checkbox"/> Video Chats (including conferences) |
| <input type="checkbox"/> LinkedIn | <input type="checkbox"/> Collaborative Document Reviewing/Editing (such as Google Docs) |
| <input type="checkbox"/> Other Social Network
(please name:) <input type="text"/> | |
| <input type="checkbox"/> Online Discussion Boards or Forums | |

You must choose at least one.

Which of the following would you most likely use (or most want to use)?

(Check all that apply.)

- iPod
- iPod Touch
- iPhone
- Other Smartphone (such as a Blackberry)
- Netbook (a small laptop primarily designed for email and wireless communication)

You must choose at least one.

Out of the technologies listed below, which would you most want to use (or learn to use) in order to learn or network more in the program?

(Check all that apply.)

- | | |
|--|--|
| <input type="checkbox"/> Computer | <input type="checkbox"/> Blogs |
| <input type="checkbox"/> Internet | <input type="checkbox"/> Wikis |
| <input type="checkbox"/> MP3 Player | <input type="checkbox"/> Podcasts |
| <input type="checkbox"/> Facebook | <input type="checkbox"/> Instant Messaging (including conferences) |
| <input type="checkbox"/> MySpace | <input type="checkbox"/> Video Chats (including conferences) |
| <input type="checkbox"/> LinkedIn | <input type="checkbox"/> Collaborative Document Reviewing/Editing
(such as Google Docs) |
| <input type="checkbox"/> Other Social Network
(please name:) <input type="text"/> | |
| <input type="checkbox"/> Online Discussion Boards or Forums | |

You must choose at least one.

Identify and briefly describe any technology that you use not mentioned above.



If you have any questions, comments, or would like to elaborate on any of the survey items, please use the space below.



Once you press Submit, you will be taken to a confirmation page.

If you already pressed Submit but did NOT go to a confirmation page, then there is an error in the form. Please look over the survey and check to see that there are no error messages (they should be in red font, inside of a red box).

Appendix B

Table 1

Group Statistics

Type of School:	N	Mean	Std. Deviation	Std. Error Mean	
Use_Computer:	urban	32	3.84	.369	.065
	rural	32	3.56	.564	.100
Use_Internet:	urban	32	3.75	.440	.078
	rural	32	3.47	.567	.100
Use_iPod/iPod_Touch/i Phone:	urban	32	2.19	1.256	.222
	rural	32	1.97	1.062	.188
Use_Other_MP3_Player:	urban	32	1.47	.718	.127
	rural	32	1.44	.759	.134
Use_Social_Networks:	urban	32	2.13	1.070	.189
	rural	32	1.91	1.146	.203
Familiar_Forum:	urban	32	3.44	1.162	.205
	rural	32	3.13	1.100	.194
Familiar_Blogs:	urban	32	3.06	.982	.174
	rural	32	2.72	.958	.169
Familiar_Wikis:	urban	32	1.91	1.045	.185
	rural	32	1.97	1.177	.208
Familiar_Podcasts:	urban	32	2.50	.984	.174
	rural	32	2.31	.738	.130
Familiar_SocialNet:	urban	32	3.53	1.107	.196
	rural	32	3.22	1.289	.228
Familiar_Text Conference:	urban	32	2.94	1.318	.233
	rural	32	2.88	1.040	.184
Familiar_Video_ Conference:	urban	32	2.50	1.136	.201
	rural	32	2.50	1.136	.201
Familiar_Docs:	urban	32	2.00	1.078	.191
	rural	32	1.97	.897	.159

Table 2

Group Statistics

School Wireless:		N	Mean	Std. Deviation	Std. Error Mean
Use_Computer:	yes	35	3.77	.490	.083
	no	29	3.62	.494	.092
Use_Internet:	yes	35	3.71	.519	.088
	no	29	3.48	.509	.094
Use_iPod/iPod_Touch/iPhone:	yes	35	2.06	1.187	.201
	no	29	2.10	1.145	.213
Use_Other_MP3_Player:	yes	35	1.31	.631	.107
	no	29	1.62	.820	.152
Use_Social_Networks:	yes	35	1.86	1.141	.193
	no	29	2.21	1.048	.195
Familiar_Forum:	yes	35	3.06	1.187	.201
	no	29	3.55	1.021	.190
Familiar_Blogs:	yes	35	2.86	.974	.165
	no	29	2.93	.998	.185
Familiar_Wikis:	yes	35	2.17	1.150	.191
	no	29	1.69	1.004	.186
Familiar_Podcasts:	yes	35	2.43	.850	.144
	no	29	2.38	.903	.168
Familiar_SocialNet:	yes	35	3.14	1.216	.206
	no	29	3.66	1.143	.212
Familiar_Text_Conference:	yes	35	2.66	.998	.169
	no	29	3.21	1.320	.245
Familiar_Video_Conference:	yes	35	2.26	.817	.138
	no	29	2.79	1.373	.255
Familiar_Docs:	yes	35	2.03	.857	.145
	no	29	1.93	1.132	.210

Table 3

Correlations

		Age	Years Teaching	Use Computer	Use Internet	Use iPod/ Pod Touch/ Phone	Use Other MP3 Player	Use Social Networks	Familiar Forum	Familiar Blogs	Familiar Wikis	Familiar Podcasts	Familiar SocialNet	Familiar Text Conference	Familiar Video Conference	Familiar Docs
Age:	Pearson Correlation	1	.641**	-.297*	-.345**	-.399**	-.318*	-.507**	-.258*	-.288*	-.158	-.167	-.483**	-.075	-.143	-.129
	Sig. (2-tailed)		.000	.017	.005	.001	.011	.000	.040	.021	.212	.188	.000	.556	.259	.311
	N	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64
Years Teaching:	Pearson Correlation	.641**	1	-.265*	-.263*	-.358**	-.111	-.318*	-.282*	-.344**	-.350**	-.235	-.357**	-.114	-.149	-.185
	Sig. (2-tailed)	.000		.034	.036	.004	.382	.010	.024	.005	.005	.062	.004	.372	.240	.144
	N	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64
Use Computer:	Pearson Correlation	-.297*	-.265*	1	.773**	.346**	.246	.299**	.350**	.326**	.149	.249*	.351**	.224	.071	.252*
	Sig. (2-tailed)	.017	.034		.000	.005	.050	.016	.005	.009	.241	.047	.004	.075	.575	.045
	N	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64
Use Internet:	Pearson Correlation	-.345**	-.263*	.773**	1	.313*	.179	.340**	.349**	.350**	.160	.215	.312*	.249*	.087	.142
	Sig. (2-tailed)	.005	.036	.000		.012	.157	.006	.005	.005	.206	.088	.012	.047	.597	.262
	N	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64
Use iPod/ Pod Touch/ Phone:	Pearson Correlation	-.399**	-.358**	.346**	.313*	1	.107	.507**	.285	.386**	.189	.473**	.514**	.203	.164	.280
	Sig. (2-tailed)	.001	.004	.005	.012		.399	.000	.022	.002	.135	.000	.000	.107	.195	.025
	N	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64
Use Other MP3 Player:	Pearson Correlation	-.318*	-.111	.246	.179	.107	1	.265**	.112	.270**	-.130	.030	.032	.067	.274*	
	Sig. (2-tailed)	.011	.382	.050	.157	.399		.034	.380	.031	.305	.811	.083	.804	.598	.028
	N	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64
Use Social Networks:	Pearson Correlation	-.507**	-.318*	.299**	.340**	.507**	.265**	1	.453**	.442**	.235	.308*	.880**	.489**	.350**	.292*
	Sig. (2-tailed)	.000	.010	.016	.006	.000	.034		.000	.000	.062	.013	.000	.000	.005	.019
	N	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64
Familiar Forum:	Pearson Correlation	-.258*	-.282*	.350**	.349**	.285	.112	.453**	1	.572**	.290	.366**	.539**	.650**	.447**	.331**
	Sig. (2-tailed)	.040	.024	.005	.005	.022	.380	.000		.008	.020	.003	.000	.000	.000	.007
	N	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64
Familiar Blogs:	Pearson Correlation	-.288*	-.344**	.326**	.350**	.386**	.270**	.442**	.572**	1	.436**	.596**	.562**	.501**	.411**	.510**
	Sig. (2-tailed)	.021	.005	.009	.005	.002	.031	.000	.000		.000	.000	.000	.000	.001	.000
	N	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64
Familiar Wikis:	Pearson Correlation	-.158	-.350**	.149	.160	.189	-.130	.235	.290	.436**	1	.600**	.324**	.375**	.325**	.496**
	Sig. (2-tailed)	.212	.005	.241	.206	.135	.305	.082	.020	.000		.000	.009	.002	.009	.000
	N	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64
Familiar Podcasts:	Pearson Correlation	-.167	-.235	.249*	.215	.473**	.030	.308*	.366**	.596**	.600**	1	.460**	.504**	.308*	.677**
	Sig. (2-tailed)	.188	.062	.047	.088	.000	.811	.013	.003	.000	.000		.000	.000	.013	.000
	N	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64
Familiar SocialNet:	Pearson Correlation	-.483**	-.357**	.351**	.312*	.514**	.218	.880**	.539**	.562**	.324**	.460**	1	.563**	.445**	.327**
	Sig. (2-tailed)	.000	.004	.004	.012	.000	.083	.000	.000	.000	.009	.000		.000	.000	.008
	N	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64
Familiar Text Conference:	Pearson Correlation	-.075	-.114	.224	.249	.203	.032	.489**	.650**	.501**	.375**	.504**	.563**	1	.658**	.382**
	Sig. (2-tailed)	.556	.372	.075	.047	.107	.804	.000	.000	.000	.002	.000	.000		.000	.002
	N	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64
Familiar Video Conference:	Pearson Correlation	-.143	-.149	.071	.067	.164	.067	.350**	.447**	.411**	.325**	.308*	.445**	.568**	1	.351**
	Sig. (2-tailed)	.259	.240	.575	.597	.195	.598	.005	.000	.001	.009	.013	.000	.000		.004
	N	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64
Familiar Docs:	Pearson Correlation	-.129	-.185	.252*	.142	.280*	.274**	.292*	.331**	.510**	.496**	.677**	.327**	.382**	.351**	1
	Sig. (2-tailed)	.311	.144	.045	.262	.025	.028	.019	.007	.000	.000	.000	.008	.002	.004	
	N	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).