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USA Public School Educators' Perceptions of Electronically Delivered Professional Development Modules

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A B S T R A C T

School meetings, which today are often called teacher workshops are to conduct teacher professional development which may still be desired by today's teachers. This study was to discover if technological alternatives might be desired by one public school system in the USA. Choices included delivery of professional development via web-based learning material, CD-ROM, and PDF documents as downloadable files for print from the Internet. A questionnaire was designed to find out which media was selected most often for delivery of their own professional development. The study material for this investigation served as professional development modules. Data from surveys were collected to discover why they select them, and whether or not they prefer those modes of professional development to the more traditional modes previously experienced such as teacher meetings/workshops. There were 28 participants in this study. To assess the role of the media for delivery of professional development via learning modules. Descriptive statistics were used to identify demographics and patterns in the educators' preferences and perceptions. A major conclusion of the study included the medium selected most often was online (82% of respondents).

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1. Introduction

The United States government began major public school teacher improvement programs in the late 1950s. The government reasoned that by defining new and higher performance standards for those teachers, America's children would benefit in the classroom and would become more interested in learning their subject areas. As a result, the 1960s marked early stages of the development of systems in which teachers could upgrade their skills and knowledge through continuing education. professions and commented that while continuing education would not cure all the problems of the professions, without it no cure is possible. Indeed, by the 1970s, widespread use of continuing education

Houle (1970) saw the idea of continuing education gaining momentum and popularity across all began to serve as a basis for relicensure and recertification. This trend continued well into the 1980s, and organized and comprehensive programs of continuing education were developed in engineering, law, accounting, medicine, pharmacy, veterinary medicine, social work, librarianship, architecture, nursing home administration, nursing, management, public school education and many other professions (Cervero, 2001; Schifter, 2015).

In 1983, however, the report *A Nation at Risk* (Gardner, 1983), described the performance of American students as lagging behind that of students in other countries. In 1986, as one response to *A Nation at Risk*, the Carnegie Forum on Education and the Economy established the Task Force on Teaching as a Profession in recognition of the central role teachers play in the quality of education, and issued *A Nation Prepared: Teachers*

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for the 21st Century. A crucial element in the report's recommendations was to make teaching a profession of well-educated professionals prepared to assume new powers and responsibilities to redesign schools for the future. In this context, the report set in motion work leading to the creation of a National Board for Professional Teaching Standards. This Board established high standards for what teachers need to know and be able to do, certified teachers who met those standards, and recognized those teachers who demonstrated that expertise through performance-based criteria (Harman, 2001) For many teachers, National Board certification has now become a professional development opportunity.

In March,1994, while yet on the heels of the 1983 report (*A Nation at Risk*), U.S. Congress signed into law *Goals 2000: The Educate America Act*, an effort to establish national goals, grants and incentives by which all states could work toward increasing student academic performance. Teacher professional development was recognized as an important aspect of achieving the goals.

By the 1990s, Congress and state-level policymakers placed special emphasis on the importance of 1) standards for teachers and students, 2) school and teacher accountability, and 3) major improvements in teacher professional development and the practices that facilitate good teaching. One focus was on technology, and Congress poured federal money into the redesigning of America's educational infrastructure by inserting computer technology into its schools' classrooms.

As a result of the *No Child Left Behind Act* of 2001, the professional development of all public school teachers has gained even more emphasis. This legislation emphasizes even greater accountability for schools and educators and seeks to ensure that there are "highly qualified teachers" in all classrooms.

Since 1995, the effort to infuse technology into classrooms. By fall 2001, 99 percent of full-time regular school teachers in the United States had access to computers or the Internet in their schools (Kleiner & Farris, 2002). Since 1995, the effort in the U.S. public school classrooms has resulted in at least US$18 billion in federal funds to placing the latest computer technologies into the hands of educators, connecting every classroom to the Internet, and training teachers to use those (Stokes-Beverley & Simoy, 2016)

Over the years since, however, a gap emerged between teachers having technology and associated media at their disposal and the actual degree to which it contributed to the educator's professional growth (TNTP, 2015). Rowand's (2000) study indicated that fewer than 10 percent of teachers surveyed were currently using the computer for research and best practices, such as professional development and lesson planning. Moreover, 39 percent of teachers using the computer appeared to delegate computer use to the preparation of simple instructional materials such as classroom handouts for students. Another 34 percent used the technology merely for classroom record keeping. One study by Becker & Riel (2000) discovered e-mail to be the most popular use of technology for teachers and suggested that the "staff development effect" may begin to take place and is more present when teachers have a computer both at home and school.

The fact of the matter is that over 20 years ago it was a problem for educators to deal with technology that was pushed into their classrooms and funded by the U.S. government. One might think that teachers using technology in today's classrooms is not even an issue as teacher colleges now integrate technology into courses (Stokes-Beverley & Simoy, 2016). More perplexing, however, is a recent survey (Kelly, 2018) of teachers across the country found that nearly one in five respondents (19 percent) reported that technology has made their jobs "harder" or "much harder". That's up from 17 percent who said the same in 2017. Still, 44 percent of teachers said that technology has made their jobs "easier", and 29 percent said "much easier". In the same survey, 8 percent of respondents said technology hasn't had much of an impact either way.

Outside of classroom use of various technology, teachers participating in their own teacher professional development, methods include formal training, preparation during teacher education programs, informal experiences, and other learning opportunities. In practice, in-service teachers have traditionally engaged in professional development opportunities through in-service workshops and seminars, attendance at professional meetings and conferences, and graduate coursework. These sessions are usually held in a classroom or meeting environments.

Methods today have created alternatives through advances in technology for large scale dissemination of instruction by distance delivery (Abdal-Haqq, 1996; Bertrand-Hines, 2000) including web-based, CD-ROM, and PDF documents as downloadable files from the Internet. These media now provide new learning opportunities for public school educators through distance delivery of teacher professional development, which can help transfer new knowledge and research into the hands of teachers. Since 2002, as technology and the knowledge level of our teachers have evolved, the most recent National Education Technology Plan authored by the U.S. Office of Educational Technology (OET, 2016) stated that professional development "should

transition to support and develop educators' identities as fluent users of technology; creative and collaborative problem solvers; and adaptive, socially aware experts throughout their careers" (p. 34).

A paradigm shift in how educators can continue their professional development is emerging. Distance delivery of digitized learning material is referenced by names such as online learning, blended, web-based learning and e-learning, but whatever the labels the focus is clearly on distance learning opportunities. Delivery of professional development through these media channels alters the learning environment, particularly when there is no instructor or trainer involved in the learning process. Teachers who utilize technology for the delivery of professional development become self-directed adult learners seeking to gain professional expertise through technologically enhanced learning programs.

Traditional approaches to professional development have proven ineffective (Schmoker, 2015; TNTP, 2015) and teacher education is unable to prepare teachers for every challenge they may face throughout their career (Schleicher, 2011). While the traditional institution for professional development is evolving, Sener (2012), points out that "education has been, is being, and will continue to be cyberized" (p. 157), which he states the profession as "adapt[ing] to digital technology or culture" (p. 125). Teacher professional development is widely viewed as the most promising intervention for improving existing teacher quality (Goldschmidt & Phelps, 2010). The Internet and the World Wide Web (the Web) are now enabling the creation of media with a variety of new attributes.

These innovations are being integrated into a common distance learning environment that is becoming a mainstream delivery format suitable for many different types of learning activities, and over the years there has been extensive research and literature surrounding technology integration to guide teacher professional development efforts (McGreal, 1997; Dwyer & Li, 2000; Bertrand-Hines, 2000; Duhaney, 2000; Mehlinger & Powers, 2002; Stark, 2003; Darling-Hammond & Sykes, 2003; Boyd et al., 2008; Sener, 2012; Tucker, 2012; Kim et al., 2013; Sunnylands, 2014; NPBEA, 2015).

Effective professional development programs should take into account the nature of adult learners and the need for making learning accessible to them. As adult learners, public school teachers represent about 4 percent of the entire American civilian workforce. In web-based learning environments, adults prefer to plan their own education objectives, determine the learning activities, and develop the evaluation criteria. Programs designed for adults allow learners to exercise choice and control of their personal learning, sequence the content, select the mode of instruction, and assess their own progress (Ashton et al., 1995; Gusky, 1995; 2000; Driscoll, 1998; 2002). The question becomes how can a school, a school district, or a state, deliver professional development into the hands of educators, at the right time, on demand, whether they are at school or at home?

2. Research Method

2.1 Statement of the Problem

Delivery of teacher professional development by technological means is relatively recent. Even newer is the idea of giving educators instantaneous choices among technological delivery of media and available on demand. Therefore, little research has been conducted into the ways in which educators, as adult learners, approach the use of the technology available to them, the choices they make when choices are available, or their reasons for those choices. Research is needed if technological media are to be used wisely and effectively to improve teacher knowledge and skills.

2.2 Purpose of the Study

The purpose of this study was to discover which technological delivery media (web-based, CD-ROM, PDF documents as downloadable files for print from the Internet) educators select most often for delivery of their own professional development, why they select them, and whether or not they prefer those modes of professional development to the more traditional modes previously experienced.

The study also examined some selective demographic factors that could influence educators' perceptions and their choices of the media used for learning new knowledge and skills. These variables include grade levels of school, years of teaching experience, and highest degree received.

2.3 Setting of the Study

This study addresses the choices made by educators in Alabama public school systems in the USA when they were given an opportunity to access professional development, as learning modules, through one or more of three media: web-based; CD-ROM, and PDF documents as downloadable files from the Internet.

2.4 Introducing the Modules to Schools

The Professional Development Modules included the topics: (1) selecting and stating long-range goals and short-term measurable objectives, (2) selecting and using instructional resources to enhance instruction, (3) planning, preparing, and administering classroom tests, (4) aligning curriculum, instruction, and assessment, (5) test development: true-false (forced-choice) questions, (6) test development: short answer & completion questions, (7) test development: matching questions, (8) test development: multiple-choice questions, (9) test development: essay questions (10) item and test analysis, (11) scoring performance assessments: checklists, rating scales and rubrics, (12) classroom and behavior management, (13) parent conferencing and parent involvement.

All modules were available in three formats: (1) online (web-based), (2) CD-ROM, and (3) downloadable files from the Internet in Adobe PDF format for print. CD-ROM versions of the modules were available as hybrid CDs for cross-platform (MAC/PC) use. Choice of format was the educator's decision. In some cases, educators' supervisors assigned teachers a module or modules as professional development to correct a deficiency identified in their performance evaluations. In other cases, educators self-selected modules for professional development in areas in which they desire to study.

2.5 Organization of the Professional Development Modules

When educators accessed modules from either the CD-ROM or connected to the Internet, they utilized their Web browser. The browser initially took the educator to the module's Main Table of Contents. From there, the educator selected the module he/she wished to use from the list of module topics in the main table of contents. Every topic within the main table of contents was a clearly labeled link. Once a module topic was selected, the educator's browser took him/her to the opening page of the module, and the educator could begin study. Every module was designed with a similar format which includes the following sections: (Section A) introduction to (the name of the selected topic), (Section B) an information section containing the content to be learned, (Section C) an interactive self-quiz titled "Check Your Knowledge", (Section D) an interactive practice activity, (Section E) classroom application, (Section F) references and resources.

2.6 Design of the Study

Three research questions formed the framework for the investigation. (1) When given choices among technological delivery of professional development (Web-based, CD-ROM, downloadable files), which medium do educators select most often and why? (2) Do educators at this point in time express greater preference for self-paced, technology delivered professional development than for more traditional forms (workshops, seminars, college courses) of professional development activities? Why or why not? (3) Are there differences in the preferences of educators regarding delivery of professional development based on grade levels of school, highest degree held, and years of teaching experience?

Data pertinent to each question were collected via a survey completed by each educator who completed a module. The following sections describe the study population and sample, development and content of the survey instrument, presentation of the research questions, and explanation of how data pertaining to each question were assembled and analyzed.

2.7 Study Population and Sample

Theoretically, the study population in this project consisted of all public school (P-12) educators. However, the sample actually used for the research were all educators in Alabama public school systems who completed

one or more modules and an online or hard-copy version of an evaluation questionnaire provided online prior to a cutoff date. It is unlikely that all module users completed questionnaires because the actual sample included 28 educators. Several of the 28 participants were assigned module(s) as readings for college courses while other respondents had been directed to do so by his/her school Principal.

2.8 The Response Frequencies for the Demographic Variables

Table 1. Grade Levels of Schools in Which Respondents Worked (collapsed categories)

Grade Levels of School	Frequency (f)	Percent (%)
Elementary and Middle School	19	68
High School	5	18
No Response	4	14
Total	28	100

Table 2. Highest Degree Received by Respondents (collapsed categories)

Highest Degree Received	f	(%)
Less than Bachelors	1	4
Bachelor's	12	43
Master's	9	32
Master's+30	1	4
Master's+45	1	4
Ed.Specialist	3	11
Professional Degree	1	4
Total Respondents=28		

Table 3. Years of Teaching Experience of Respondents (collapsed categories)

Years of Experience (Not counting current year)	f	(%)
0-5 years	6	21
6-10 years	6	21
11+ years	14	50
No response	2	7
Total	28	100

2.9 The Survey Instrument

An instrument was developed because there was no employable instrument available. The professional development modules used by Alabama educators were developed under the state's Title II grant from the United States Department of Education.

Items in the survey included a series of rank-order questions related to users' opinions about technological delivery media. The respondent marked one of five Likert-type values for a statement, varying from strong agreement to strong disagreement. Responses were converted to the numerical values of 1, 2, 3, 4, and 5 for descriptive statistical analysis.

2.10 Survey Distribution

The survey could be completed and submitted in five ways: 1) online completion and submission, 2) submission of hard-copy downloadable from the CD-ROM for printout, 3) submission of hard-copy downloadable from the Internet for printout, 4) completion and submission of available pre-printed hard-copies, and 5) e-mail submission. Additionally, pre-printed hard-copies of the survey were available at those schools for those educators who did not wish to utilize the Internet or the CD-ROM.

3. Analysis of Data

The first objective of this study was to identify which technological delivery medium (web-based, CD-ROM, PDF downloadable files from the Internet for print) educators selected most often for delivery of their own

professional development. The second objective was to identify why they selected them. A third objective was to determine whether or not educators preferred technological modes of professional development to the more traditional modes previously experienced.

When completed instruments were received by the researcher, they were screened and assigned an identification number. Responses from data collected were entered and analyzed with SPSS software. Responses were reported without identification of the educator, school, or school system. Descriptive analyses were employed to answer the research questions, which focused on the above mentioned objectives.

The study also examined some selective demographic factors that could influence educators' perceptions and their choices of media to learn new knowledge and skills. These variables included grade levels of the educator's school, years of teaching experience, and highest degree received.

Two conclusions can be drawn from the first research question about choice preference when given from among technological delivery of media (Web-based, CD-ROM, PDF downloadable files). (1) The predominant medium selected most often was online (82% of respondents). (2) Reasons most often cited by respondents for selecting the mediums they chose were: (a) told by supervisor to use that medium (73%), (b) convenience and ease of access (64%), and (c) control of their own time/schedule (50%).

Table 4. Rank Order of Delivery Formats Available to Participants

Delivery Method	F	(%)
Online	22	100.00
Print	5	22.7
CD-ROM	4	18.2
Workshop	4	18.2
Formal Class	3	13.6

Total Respondents=22

Table 5. The Frequency and Percentage of Participants' Responses

Format	F	(%)
Online	23	82.1
CD-ROM	3	10.7
PDF	0	0.0
Online and CD-ROM	2	7.1
Online and PDF	0	0.0
CD-ROM and PDF	0	0.0
All	0	0.0

Total Respondents=28

Various response items identified which format or combination of formats, including Online (web-based), CD-ROM, and PDF documents (print format) was used in completing the module for which the educator completed the questionnaire.

To answer the second part of Research Question 1 (why participants chose that medium), particular responses of the questionnaire were analyzed in choosing the delivery method) included the frequencies and percentages for each item.

Responses were listed from the highest number to lowest by calculating frequencies and percentages, then ranking the responses from highest to lowest percentage.

Table 6. Participants' Reasons for Choosing Delivery Method

Reason	F	(%)
I was told to study the module using this delivery method.	16	72.7
Convenience/ease of access	14	63.6
Flexibility of completing the nodule on my time schedule.	11	50.0
When using this method, I was not concerned with privacy.	5	22.7
I like to work by myself.	4	18.2
I was most comfortable with this method(s).	3	13.6

Total Respondents=22

Table 7. Other Reasons Given by Participants for Choice for Delivery Method

Delivery Method	F	(%)
It offers greater portability(I can take the CD or print copy with me.)	3	30.0
I don't like to keep track of hard-copy printouts.	3	30.0
I don't like the hard-copy printout because it is like reading a text book.	2	20.0
I like to read the material from a computer screen.	2	20.0
My Internet connection is too slow for use of the online format.	0	0.0
I don't have access to a printer to make hard-copy printouts.	0	0.0
I had no access to the PEPE website at school/work or at home.	0	0.0
CD's and print copies are "permanent" , the web format is temporary.	0	0.0
My Internet connection is not reliable/stable enough for me to use the Web.	0	0.0

Total Respondents=10

The next point focuses on respondents' opinions in their preferences between electronic delivery versus traditional methods. Questionnaire items asked participants to rank-order their preferences for online, CD-ROM, printed modules, workshops, and formal classes as methods of delivery for professional development. Additionally, responses were averaged separately to show if the mean was higher or lower than 3, a neutral rating on the Likert-scale. The mean rating determined if, at this point in time, educators expressed greater preference for self-paced, technology delivered professional development than for more traditional forms of professional development activities.

The same process was repeated to answer the "why" 2. To answer why educators at this point in time expressed greater preference for either self-paced, technology delivered professional development or for more traditional forms of professional development, responses to particular questionnaire items were looked at for analysis.

Conclusions relevant to this question are: (1) educators in the study preferred online delivery of professional development over college courses, CD-ROM, meetings, and workshops (60% of respondents), (2) reasons given most often for preference of online delivery were: (a) they favor being able to control their own schedules, (b) online or CD-ROM learning is effective for professional development.

Table 8. Respondents' Delivery Preference Based on Rankings

Preference	Respondents	(%)
Online	9	60.0
College Courses	4	26.7
Printed Modules	1	6.7
Workshops	1	6.7
CD-ROM	0	0.0
	15	

Table 9. Participants' Responses to Professional Development Style

Question	SA f(%)	A f(%)	N f(%)	D f(%)	SD f(%)	Mean
D2:I prefer online or CD ROM professional development modules to meetings and workshops.	8(36.4)	7(31.8)	4(18.2)	2(9.1)	1(4.5)	3.86
D6:I prefer online or CD formats for professional development because I can control my own schedule.	10(45.5)	5(22.7)	6(27.3)	0(0.0)	1(4.5)	4.05
D7:I prefer workshops or group professional development because I feel that learning is largely a social experience that online or CD-ROM does not offer.	3(13.6)	4(18.2)	10(45.5)	3(13.6)	2(9.1)	3.14

Total Respondents=22

Mean is based on (SA) Strongly Agree=5, (A) Agree=4, (N) Neutral=3, (D) Disagree=2, (SD) Strongly Disagree=1

Table 10. Participants' Responses to Questions about Delivery Preferences

Question	SA f(%)	A f(%)	N f(%)	D f(%)	SD f(%)	Mean
D1:Online or CD-ROM learning is effective when utilized as an integral part of professional development.	13(59.1)	5(22.7)	4(18.2)	0(0.0)	0(0.0)	4.40
D3:I would not have used Alabama's online or CD-ROM professional development had three been another option.	1(4.5)	1(4.5)	5(22.7)	9(40.9)	6(27.3)	2.18
D4:I think I learned as much from a online or CD-ROM module as I would have from a workshop on this topic.	10(45.5)	6(27.3)	3(13.6)	2(9.1)	1(4.5)	4.00
D5:I will seek other opportunities to pursue professional development through CDs or online activities.	13(59.1)	5(22.7)	3(13.6)	1(4.5)	0(0.0)	4.36
D8:I believe Alabama's online or CD-ROM professional development are more effective than other methods I have experienced.	5(22.7)	4(18.2)	9(40.9)	3(13.6)	1(4.5)	3.40

Total Respondents=22
Mean is based on (SA) Strongly Agree=5, (A) Agree=4, (N) Neutral=3, (D) Disagree=2, (SD) Strongly Disagree=1

The third research question was preference of delivery mode included online, CD-ROM, PDF, print material, workshops/staff meetings, and formal college courses. (1) Among elementary and middle school teachers, online delivery was the most preferred method of professional development (67% of respondents). (2) For the respondents, online delivery was the most preferred method of professional development, regardless of degree level. (3) Among "newer teachers," those with 5 years or less of classroom experience, online professional development and college coursework was equally as popular as formal college courses (40% of respondents). For educators with 6-10 years of experience, every vote was for online delivery as the preferred mode (100% of respondents), and those educators with 11 or more years of experience, online delivery of professional development was the preferred mode (57% of respondents).

Response questions identified any differences in preferences that existed among educators in regard to selected demographic variables. Demographic variables used for Research Question 3 included grade levels of school, highest degree received, and years of teaching experience. Educators' preferences were addressed too. Gender was not included in this study because of the disproportionate number of males (4 males and 24 females).

Data for Research Question 3 were presented in tables using frequencies and percentages because Chi-square analysis could not be used, given the small number (28) of survey returns.

Demographic variables, in relationship with responses, were used to find differences in preferences of delivery method (web-based, CD-ROM, PDF print material, staff development workshops, and college courses) among the various sub-groups: 1) Online (web-based instruction), 2) Instruction through CD-ROM delivery, 3) Instruction through printed (hard copy) modules, 4) Staff development workshops (meetings, conferences, 1-2 day sessions), and 5) College or other formal classes.

Table 11. Delivery Preferences of Educators by Pre-K-Middle Grade Schools

Format	Pre-K-Middle	
	f	(%)
Online	8	66.7
CD-ROM	0	0.0
Print Material	1	8.3
Workshops/Staff Meetings	1	8.3
Formal College Course	2	16.7

Total Respondents=12
Note: The High School respondents and 11 Pre-K-Middle respondents could not be included because no preference could be determined.

Table 12. Delivery Preferences of Educators by Educational Background

Format	Educational Background			
	Bachelor's or Less*		Master's or Higher**	
	f	(%)	f	(%)
Online	4	50.0	5	71.4
CD-ROM	0	0.0	0	0.0
Print Material	1	12.5	0	0.0
Workshops/Staff Meetings	1	12.5	0	0.0
Formal College Course	2	25.0	2	28.6

* Respondents=8
** Respondents=7

4. Discussion with Suggestions, Implications

4.1 Discussion on Adult Learning

The researcher believes, as the literature suggests, that adults are lifelong learners. As evidenced from this study, fifty percent of participants had 11 or more years of experience, suggesting that educators are continuous and lifelong learners, either by choice or mandate. From a pedagogical viewpoint, web-based learning can contribute greatly to lifelong learning. Web-based learning, as used in this study, provides ongoing and independent professional development opportunities for educators.

Self-service learning through web-based, CD-ROM, and PDF files, as used in this study can serve educators, as an as-needed alternative approach to traditional teacher training. In the context of adult learning, the researcher's view gained from this study is that in a self-service learning environment, where learning is available on an anytime and anywhere basis, educators are encouraged to become self-directed and lifelong learners in order to seek out learning material relevant to their ongoing careers. The key, is then, for school administrators to give teachers freedom of choice and/or merge delivery systems such as in-service workshops and online learning in order to facilitate self-direction.

Another perspective derived from this study is that adults desire to manage their own learning. An overwhelming majority of respondents (82%) indicated that they will pursue professional development through web-based delivery, and 50 percent of respondents indicated flexibility of the delivery method as a reason for usage. As self-directed managers of their own learning, participants in this study actively pursued the knowledge they needed to do their jobs better. Not only were modules available at any time convenient for those participants, but the modules' hypertext format effectively put them in control of the learning pace, the sequence of the content, and assessment of their own progress.

Finally, another perspective derived from this study is that self-directed learning occurs most often in learners' natural settings and is initiated and carried through primarily by the learners themselves. From the study at hand, no respondent indicated he/she did not have access either from home or school to the modules.

Respondents had to initiate and carry through the learning themselves. There were respondents who indicated that they were completing the module(s) as part of a college course. Those in college credit courses clearly were motivated to continue their learning experiences by enrolling in a college course. While their registration in the courses was planned, homework assignments including the professional development learning modules were unplanned parts of the learning environment, parts that course registrants may not have known that when registering. The self-initiated activity of utilizing the online delivery of professional development is an example of self-directed learning. Learning in this way is particularly notable since there is no instructor in the learning process.

The results of this study, from the researcher's perspective, is that adult learners, in this case teachers, have the capacity and ability to be self-directed. Although this investigation was not planned to be a study of adult learners or the applicability of online learning modules to adult learning settings, it seemingly has contributed to the adult learning knowledge base.

4.2 Discussion on Professional Development

Processes and activities of professional development, of course, must be designed as opportunities to expand teachers' knowledge, skills, and dispositions throughout their careers so they may seek out answers through

various learning opportunities. This study found that at different stages of their careers the participant educators selected different types of learning opportunities. Respondents with a Bachelor's degree or less indicated a preference for online delivery, but appeared to find print material, workshops, and formal college courses equally beneficial. More than half of the educators with a Bachelor's degree or less and almost three quarters of those with a Master's degree or higher preferred online for delivery of professional development. Additionally, those participants with a Master's or higher educational degree clearly demonstrated preference for online delivery and formal college courses. When considering professional development activities, this study found that 36 percent of the respondents indicated a preference for online modules over meetings and workshops and 14 percent of respondents indicated that they still prefer workshop activities because they feel learning is largely a social experience that online delivery does not offer.

While we do not yet have a unifying single model for a professional development system, the modules offered through this study are yet another approach to professional development activity. Modules, as utilized in this study, can promote personal growth, and web-based delivery in the form of customized pre-packaged professional development topics encourages professional development activity at the personal level, promoting personal satisfaction and professional growth.

Results from this study indicate and suggest that web-based delivery of professional development is flexible enough to suit users, it offers self-paced, self-selected individualized learning opportunities, provides a format for self-analysis and personal reflection, and has an understandable appeal. In short, web-based delivery is very manageable for educators.

This study reflected similar findings according to number of years of work experience. That is to say, fewer than half of the participating educators with five years or fewer of work experience selected online as the preferred delivery mode, but every educator with 6-10 years selected online, and over half of those educators with 11 or more years of experience selected online as the preferred delivery format.

It is the researcher's view that new teachers have been taught through college coursework, practicums, and internships that the accepted method of professional development is traditional classes or in-service meetings. Therefore, newer teachers do not veer from that format until they become more experienced teachers and can begin to feel comfortable enough to begin self-selecting alternative modes such as online.

4.3 Discussion of Educators' Use of Technology

From the study at hand, 60 percent of respondents indicated a desire to use the technology in professional development. The study at hand found no evidence through respondents' additional comments on questionnaires of difficulties with online learning due to their lack of technology skills. Considering that 73 percent of respondents indicated they were told which delivery method to use to study the modules, it appears that participants in this study do not struggle with technologies such as the use of computer and connecting to the Internet.

However, it should be remembered that the sample consisted of only 28 teachers. These individuals may have been known to possess good computer skills. There may be many teachers out there who would struggle when trying to use this delivery mode.

While this study did not seek to determine whether educators were accessing modules from home and/or their classrooms, it can be assumed that educators had accessed the modules from one of those two locations. One reason that this is probably a safe assumption is that several participants were assigned modules for readings in college courses and may have completed those reading at home and/or at work. A second reason is that several participants were directed to the modules through supervisors (Principals) who work with these persons every day.

Also, participants' reasons for choosing web-based delivery method indicated that almost 64 percent of respondents selected it because of convenience/ease of access, and 50 percent indicated flexibility of completing the module on his/her own time schedule. Either of these reasons could suggest that participants could access modules from both home and school. Participants in this study did not seem to lack basic technology skills.

4.4 Discussion of Media Resources for Delivery of Professional Development

The researcher suggests that participant teachers in this study are most likely to use in the future a number of different media to support their professional development including online, CD-ROM, and PDF as downloadable files from the Internet. Since the study at hand offered PDF documents as downloadable files

from the Internet as one mode available for modules, it is likely and assumed that participants downloaded and printed out hard copies of various modules. However, 30 percent of respondents indicated they did not like to keep track of hard-copy printouts and 20 percent indicated they did not like hard-copy printouts because this process is like reading a text book. The study at hand found that 23 percent of respondents indicated they believe online or CD-ROM professional development is more effective than other methods they have experienced and only five percent indicated they would not have used these media had there been another option.

The researcher does not suggest that digital learning modules replace traditional media in professional development, but that they should generally be added to the pool of resources available. Digital delivery formats for professional development are now being selected as often or more often than traditional formats such as formal classroom and in-service workshops, at least by some teachers, as evidenced in this study.

When considering the educational assignments and backgrounds of study participants, it was found that among teacher respondents in Pre-K through middle grades group, 67 percent indicated online as their preference and college courses was a distant second choice (17%). No data were available for high school teachers because those respondents either duplicated rankings from among the choices offered or did not answer this question. No educator with a Master's degree or higher selected print material or workshops as desirable formats for delivery of professional development.

Other interesting findings were that 23 percent of respondents in this study were not concerned with privacy issues, and 18 percent indicated they like to work my themselves.

Additionally, 82 percent of respondents indicated that web-based learning is effective when utilized as an integral part of a professional development program. Only nine percent of respondents indicated that they would not have used the modules had there been another option.

As noted previously, simultaneous choices of multiple delivery mechanisms (web-based, CD-ROM, PDF) for professional development could not be located. In this study, the CD-ROM format was not selected even once as a preferred format for delivery by any category of educators in this study. One reason for the overwhelming selection of online delivery might be that CD-ROMs, although made available to the Alabama Department of Education may not have been widely distributed throughout the state. Many of those CDs may never have made it into the hands of educators. Only 18 percent of respondents indicated that a CD version was available to them. A second reason based on survey responses was that many respondents (73%) were told by their supervisors to use online delivery. A third reason for lack of CD use could be the sense that online material is always current while CD content like textbooks is more "permanent" and, therefore could be outdated. There was a survey item regarding the perception of permanence versus temporariness which no respondent checked as a reason for choice of delivery format, but this is still a possible consideration.

4.5 Other Discussion

It should be remembered that the 28 respondents in this study are not representative of the Alabama educator population and that the results of the study cannot be generalized to the larger population. However, it is interesting to note that two educators from the states of Vermont and Pennsylvania found the professional development modules while on an Internet search for professional development material which they could personally use. Those two surveys were submitted online and included very positive comments about the content of the online modules and the availability of professional development opportunities in this format. (These two surveys were not included in the study, which was restricted to Alabama educators.)

Also, the Dean of a college of education from a university in Canada e-mailed the researcher and asked formally for permission to use the professional development modules. The intended use was integration into that teacher education curriculum. At least two other education colleges in Alabama have integrated the Alabama professional development modules into their curricula. Those professors are now using various modules as student readings. This use is known because at least three of the returned questionnaires from teachers included a comment that various modules online had been assigned for coursework readings by their professors.

While these usages of the online modules were not addressed in the research, they suggest that electronic delivery of professional development opportunities will become increasingly popular, if content and format are carefully chosen.

4.6 Implications

Though the sample was limited to 28 educators in the state of Alabama, USA, the study confirmed that online delivery has an important future role in professional development of educators. A major implication of this study is that professional development (i.e., specific customized learning modules) should be added to choices for delivery of ongoing professional development regularly available to Alabama educators. Although Alabama offers traditional in-service and other training and learning opportunities, educators are interested in furthering their professional development through online learning.

Another implication concerns those educators who may lack the knowledge and skills necessary for online delivery. They should be provided opportunity to develop the required knowledge and skills through workshops and in-service programs provided by the State Department of Education and/or local education agencies. They could then take advantage of these new delivery methods.

Another implication of this study is that there appears to be a lack of CD-ROM availability to educators in Alabama. Every school can obtain copies of the professional development CDs used in this study. Many teachers could then copy them if they desired, thereby optimizing the learning choices available.

Yet another implication of this study is that the availability of present and future online and CD learning opportunities will need to be marketed to potential users. This marketing needs to include encouragement to use the products at home or at school.

Another implication of this study is that teacher education colleges appear to be very interested in having access to these professional development modules. A few institutions of higher education (IHEs) have already begun to integrate the modules into their teacher educator curricula. Why not use the modules, which can contribute to a better prepared teacher workforce?

Another implication of this study is the potential for research in other countries including Taiwan, Indonesia, Japan, and South Korea. What are current professional development programs in these countries in relation to technological means? Would public school teachers and administrators welcome technological professional development delivered on-demand? If so, then what formats and what is the scope and depth for teacher learning and accreditation for achieving?

The final implication of this study is that the present modules appear to work very well for now, but to keep abreast of professional development needs and changing technology, they will need to be continually updated. Further, new modules on new topics will be needed.

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