

# **Distance Education Using Contemporary Technology**

**David A Wahlström USA**

**Key words:** Skype, Yugma, Pamela, Continuing Education, Distance Education

**SUMMARY** This paper and its presentation cover the use of inexpensive computer technology and tools to deliver enhanced educational content over the internet; the only constraint being the necessity of each user to have a broadband internet connection, a reasonably new computer, speakers, and a microphone.

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## 1. INTRODUCTION

I have presented surveying refresher (preparation) seminars<sup>1</sup> for nearly forty years to individuals preparing to take State and National qualification exams.<sup>2</sup> Successful completion of these exams is a prerequisite to receiving a license to practice the profession of surveying. In the USA, these practitioners are often identified as Professional Surveyors (PS) or Professional Land Surveyors (PLS).

My seminar audience has been, with few exceptions, surveying technicians with a combination of field and office experience. Typically, the total number of years of experience prior to sitting for the Fundamentals Examination<sup>3</sup> (FE) ranges from four to six years. Some, however, 'put off' the exam until they are well into their thirties. Importantly, the clear majority of examinees have two or fewer years of formal education beyond the High School diploma.<sup>4</sup>

Over the years, I have presented seminars in the far reaches of the USA from Orlando to Los Angeles to Missoula to Boston. Whether I was living in New York, Indiana, Texas or South Dakota, I have had to travel the day before and very possibly the day following. Attendees have also had to travel. Although most attendees have been from the same State as where the seminar was being presented, they have often had to drive between 200 and 300 miles (322 to 482 kilometers) to the seminar site. This necessary traveling has resulted in attendees often taking three days away from work and/or family. Not only is travel time a factor in deciding whether to attend the seminar; the associated expenses often are burdensome and are becoming more burdensome! An unintended consequence of these issues

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<sup>1</sup> Some prefer the term 'workshop'. In my case, the term 'seminar' is more appropriate because delivery is almost exclusively of a lecture nature.

<sup>2</sup> In the United States of America (USA), the practice of professional surveying is regulated at the State level; however, most, if not all, States administer an examination authored by the National Council of Examiners for Engineering and Surveying (NCEES) for at least a portion of the complete examination.

<sup>3</sup> This examination was formerly known as the Surveyor in Training (SIT) exam and is authored by NCEES. Examinees who pass this examination are often referred to as Surveyors in Training. Typically, this exam is taken following four to six years of increasingly complex experience. Presently, there is a tendency to allow four year baccalaureate degree holders to sit for the examination without any actual work experience.

<sup>4</sup> This is changing slowly as the number of States requiring the four year degree for licensure is increasing.

(time and money) is that many cannot afford to attend and, instead, try to teach themselves. Unfortunately, some fail and repeat the exam(s) only to fail again.

In the early '80s, I started recording the live seminar presentations on audio cassette tapes and selling the tapes along with a copy of the seminar handout. The tapes were not edited and sometimes contained long pauses and/or indecipherable chatter. Regardless, they were well received and I have received compliments years after I ceased marketing the cassette tapes.

While I was a professor at the University of Houston (Texas), I was introduced to the concept of distance education. In the early '90s, a concerted effort was made on campus to offer courses to remote University facilities via a dedicated connection and over cable TV. Attendees at the remote facilities witnessed a 'live' presentation via TV and those who chose to view the lecture over cable TV often recorded the lecture on their videocassette recorder (VCR) for later viewing; (many of the cable presentations occurred late at night when bandwidth was plentiful). Eventually, the University marketed courses first on VCR tapes and presently on digital versatile discs (DVDs). However, I never took the time or invested the money to prepare a set of studio produced DVDs for my seminars. I still think about it occasionally; however, I am unsure of the market.

Depending on the topic at hand, each seminar has consisted of lecturing, illustrating, and solving. For instance, when discussing property boundary issues, the presentation is almost exclusively of a lecture nature, sometimes accompanied with a sketch developed as the lecture proceeds<sup>5</sup> or as a question is raised. On the other hand, when discussing the solution of a solar azimuth problem, a sketch and the actual problem solution steps are developed.

It should be obvious that delivering the lecture portion is maybe the easiest and can be delivered using virtually any medium. However, the same cannot be said for the problem solution portion of the seminar. Trying to explain an existing illustration works occasionally; however, the clarity of the solution would be enhanced by observing the development of the steps. And, absent a whiteboard, a verbal illustration may lead to even more confusion.

## 2. NOVEL IDEA

Thirty-nine years after giving the first seminar, I'm trying a new (at least new to me) medium. By accident, I opened my Skype<sup>6</sup> client<sup>7</sup> not too long ago and noted the term 'Create Conference'. Considering I had participated in numerous conference calls in the past, I was intrigued by the fact that this conference call just might be free<sup>8</sup> or at the very least,

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<sup>5</sup> The handout has always included an illustration, too.

<sup>6</sup> Skype (skype.com) is a free P2P (peer to peer) application that provides free voice-over-IP communication over the Internet. Skype is owned by eBay (ebay.com)

<sup>7</sup> Skype has been installed on my computer for a couple of years; however, I have used it very little. I do remember placing a call to Sweden a few years ago. It worked fine. I also purchased a handset that works OK; however, it was never handy when I wanted to make a call so it went unused.

<sup>8</sup> Skype openly advertises 'free Skype to Skype calls'. In essence, if you have access to the internet, you may make a 'free' call.

very inexpensive.<sup>9</sup> Further investigation showed that conference calls are also free as long as each user uses the Skype client on her computer.<sup>10</sup>

Obviously, the next question to be answered was “Will my great idea work?” About the only way to find out was to do a little test project. At this point, my interests were focused on whether the technology was adaptable to my situation rather than whether the idea was marketable. Given that, I quickly established a preliminary procedure.

With only modest revisions to my initial ideas, the procedure for the test project became:

1. Determine whether anyone is interested in participating.
2. Collect email addresses of all participants.
3. Arrange a convenient time for everyone to ‘connect’.
4. Post a handout for participants to download and read prior to the first session.
5. Prepare the lecture for the first session.
6. Deliver the lecture at the agreed time.
7. Analyze the ‘feedback’.
8. Get ready for the next week.

### 3. EXPERIMENTING

To get started, I placed a note on a National forum<sup>11</sup> internet page offering a free seminar. Within a day, I had six participants willing to give it a try. In their ‘application’, they stated their best times to connect and included an email address.

It did not take long to determine there was a problem! Three participants lived and worked in the Eastern time zone (GMT -5 hrs), three participants lived and worked in the Pacific time zone (GMT -8 hrs), and I lived somewhere in between (GMT -6 hrs). There was, interestingly, agreement on the day – Friday. Little did I know at the time that this would lead to the biggest problem [too many interruptions (holidays, sickness, travel, etc.)]!

The fact that I now had an audience resulted in having to do something! First, I assembled the tools:

1. Hardware
  - a. Laptop with duo-core technology
  - b. High quality webcam
  - c. Headphones / Microphone
  - d. Wireless mouse
  - e. Wacom Graphite tablet
  - f. Fiber optic internet connection

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<sup>9</sup> Calls to ‘regular’ phones or to mobile phones cost from \$0.021 per minute. Calls to other countries may cost more.

<sup>10</sup> Conference calls are free for up to ten participants.

<sup>11</sup> Point of Beginning Message Board ([www.rpls.com](http://www.rpls.com))

2. Software
  - a. For conference calling: Skype from <http://www.skype.com/>
  - b. For call recording and podcasting: Pamela for Skype from <http://www.pamela-systems.com/>
  - c. For whiteboarding: Yugma – Skype Edition from [http://www.yugma.com/share\\_skype.php](http://www.yugma.com/share_skype.php)
3. Other
  - a. Server space for uploading files (principally handout material)

The laptop used was a Dell Latitude D820 with an Intel® Core™ 2 CPU and the webcam was a Logitech Quickcam Pro 9000. The Wacom tablet was used to make sketches and annotate text and prepared illustrations. My budget limited me to the smallest tablet - one with a 4 inch by 6 inch (10 cm by 15 cm) sensitized surface mapped to the laptop's screen.

Initially, I used the headphones which included a 'boom' microphone. However, I did not like the pressure on my head and the 'boom' mike was not fixed in place so the volume would tend to taper off. Also, if I got up from using the laptop, I would have to remember to unplug the headphones and the microphone. I then tried the microphone which is built into the webcam and the speakers which are built into the laptop and was satisfied with their overall performance. It should be noted that I have a quiet place at home to work; therefore there was little, if any, background noise.<sup>12</sup>

I prepared my first lecture, uploaded related 'handout' material, emailed reminders, and logged on to Skype at the appointed hour. Participants soon logged in (I could 'see them' as they logged into Skype) and I added them to the conference. The lecture went on without much trouble and a couple participants asked questions. The hour went by reasonably quickly, and only one participant lost her connection and was unable to reconnect (I think I made a mistake when I tried to reconnect her). Others indicated "so far, so good" and said they would return in a week. And, they did!



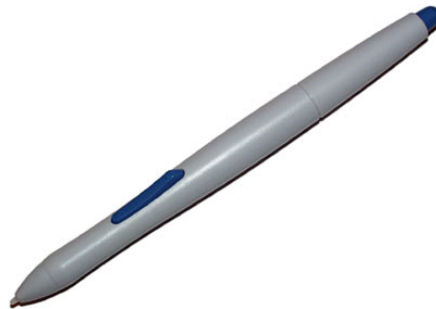
**Figure 1.** Logitech Pro 9000 webcam

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<sup>12</sup> This was not the case with all the conference call participants, however. But, the conference's host (me, in this case) can mute the other participant's Skype connection at will.



**Figure 2.** Wacom Graphite tablet



**Figure 3.** Pen for use with the tablet

#### **4. ILLUSTRATING SUBJECT MATTER**

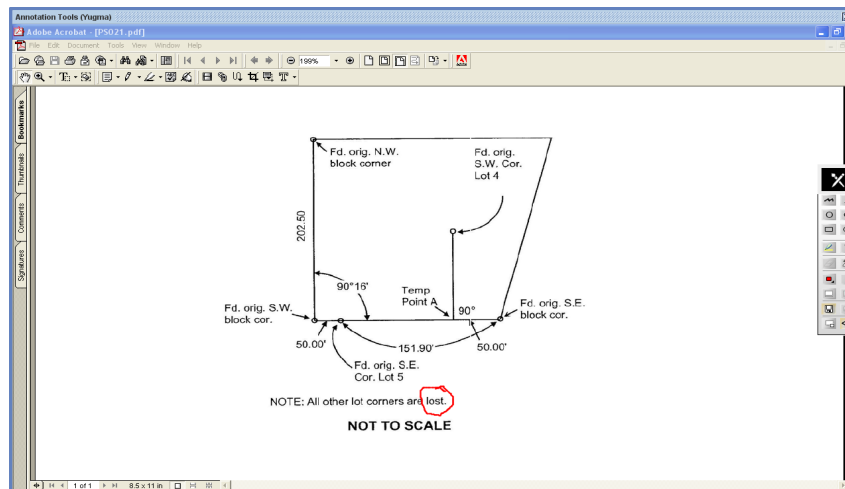
In the intervening period, I went looking for a whiteboard - it became obvious during the first lecture that absent some way of making sketches, my efforts would be made much more difficult!. Skype has a number of add-ons available from multiple vendors with some of the add-ons being Skype Certified. Consequently, I found a Skype certified whiteboard called YugmaSE.<sup>13,14</sup>

YugmaSE's free version offers desktop viewing/sharing, annotating of files as they appear on the desktop, and whiteboarding (sketches, hand written notes, etc.).

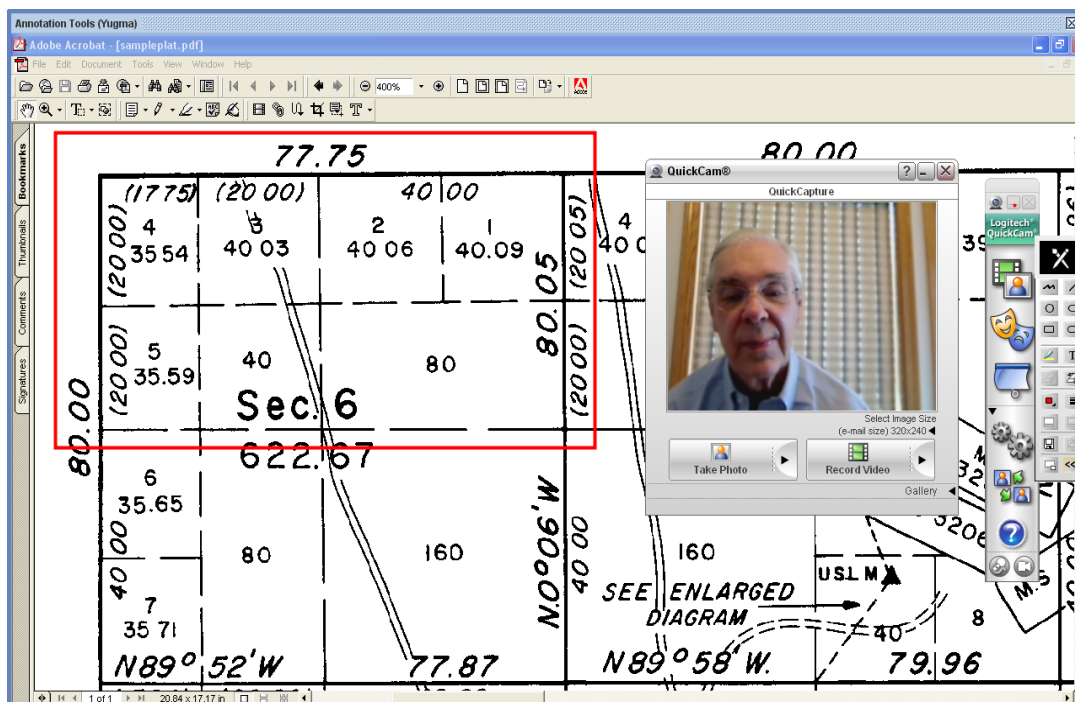
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<sup>13</sup> Yugma – Skype Edition ([yugma.com](http://yugma.com))

<sup>14</sup> For Windows users, YugmaSE can be obtained and installed via Skype's Extras Manager (Tools | Do More | Get Extras | Sharing)



**Figure 4.** A sample exam illustration. ‘Lost’ is a word of art and is critical to the solution - it was annotated during the presentation. The Yugma toolbar is stored along the right margin.



**Figure 5.** The North ‘half’ of Section 6 – the annotation was added during the lecture. The Logitech webcam and toolbar allow ‘live’ video to be displayed.

Yugma’s enhanced version includes the ability to record and playback the presentations at a later date. There is also a provision for making all of the host’s illustrations view only.

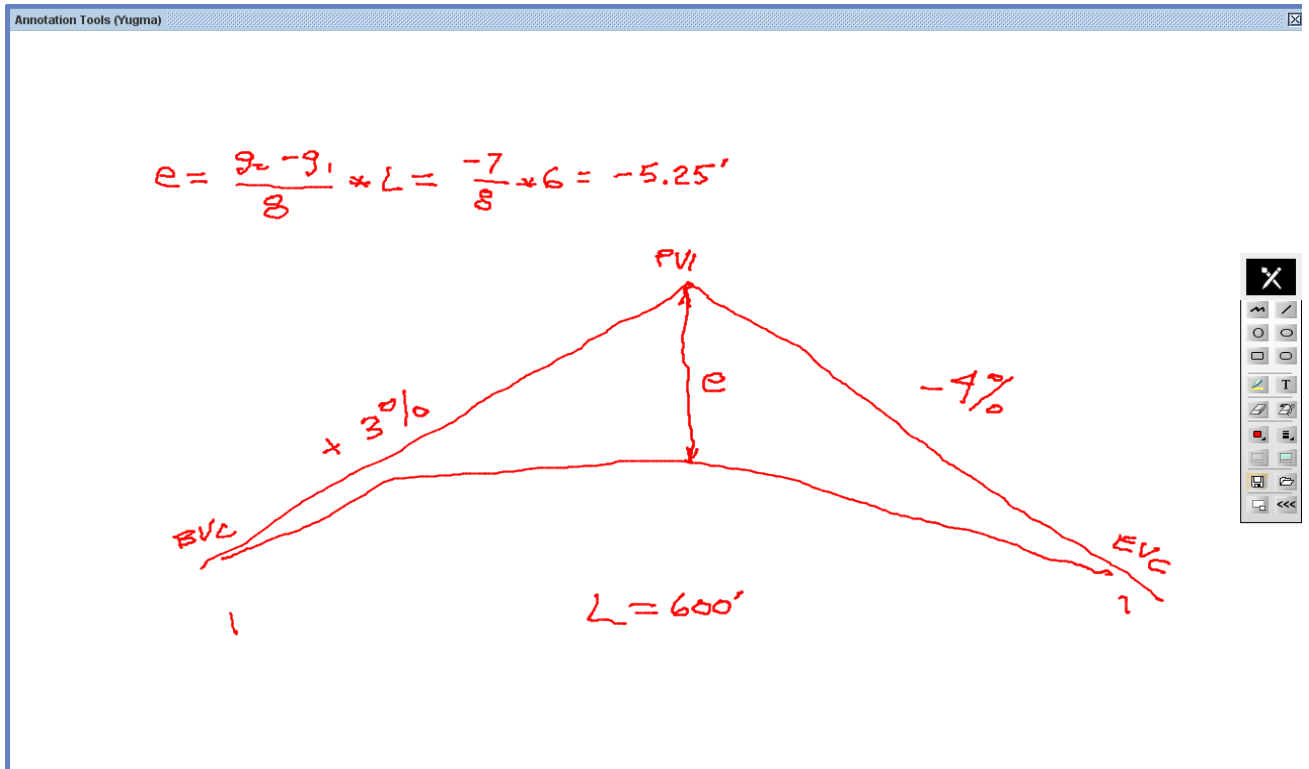


Figure 6. A freehand sketch made simultaneous with voice commentary.

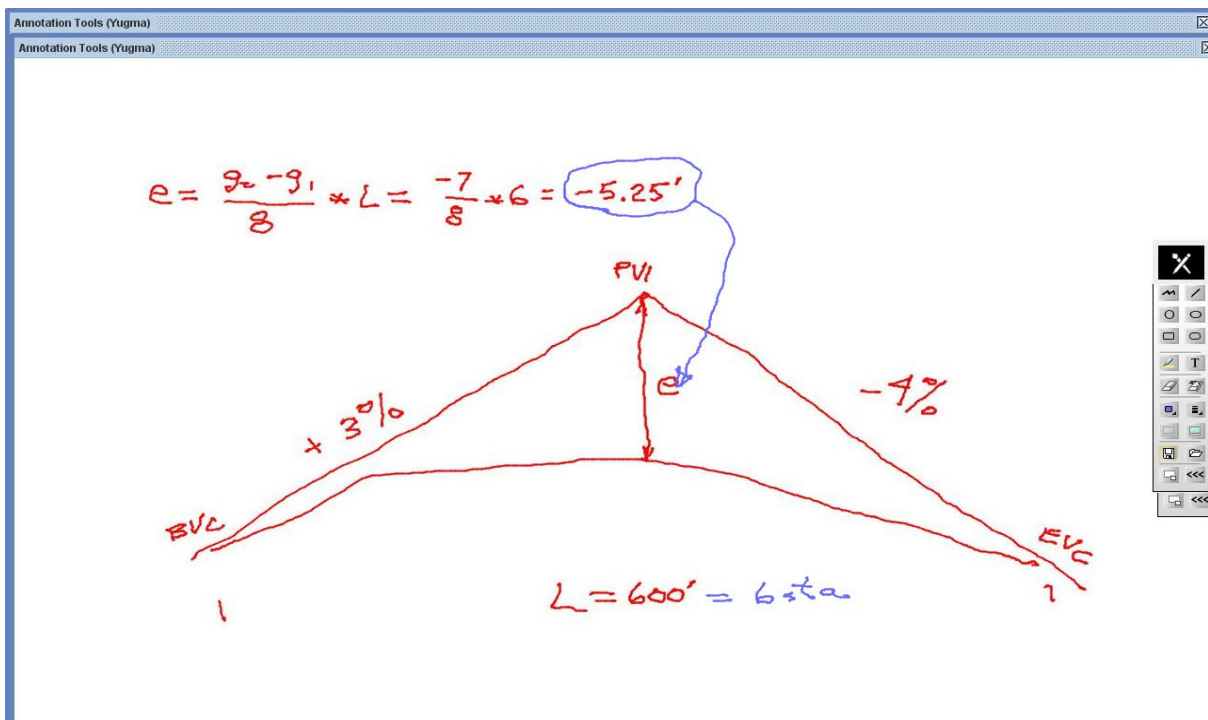


Figure 7. Figure 6 above retrieved and annotated in response to a question.



## 5. MORE ENHANCMENTS

I also added another Skype Certified add-on called Pamela.<sup>15</sup> Pamela allows one to make a voice recording of an entire session, regardless of its length, and generates an \*.mp3 file. As a result, Pamela can be used to create a podcast of the presentation. Podcast files, if loaded on a server, will allow participants to down the files and listen to them, at their leisure, on their Apple iPod.<sup>16</sup> (*Interestingly, it looks like I've come full circle from the days of marketing cassette tapes!*)

## 6. WHAT PARTICIPANTS SAID

1. Regarding Skype: The voice quality was good for the purpose at hand. The lost connection issue was troublesome.
2. Regarding Yugma: Illustrations displayed using the Yugma whiteboard were excellent and the use of Yugma was very beneficial.
3. Regarding FTP services: Downloading from the site was trouble free. However, the FTP site lacked organization; therefore, ease of use was compromised.
4. Regarding podcasts: Use of a podcast would be helpful; however, its effectiveness would be less than optimum if related illustrations were not available.

## 7. WHAT'S NEXT

There are many additional uses for the technology outlined in this paper. Additional ideas relate are stated below.

1. Many survey crews carry laptops with WiFi<sup>17</sup> capabilities into the field. Using the illustration techniques as outlined above would bring communications to a significantly higher level and would often result in reducing travel back to the office.
2. Any organization with multiple office locations could conceivably enhance inter-office communications by using the technology.
3. Multiple office organizations could share training opportunities without having to transport workers to a central location.
4. None of the ideas expressed above are exclusive to the surveying profession. In fact, any profession or industry seems to always be looking for ways to reduce wasted travel time! For a few hundred dollars, they can easily do so.

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<sup>15</sup> Pamela Basic (pamela-systems.com) limits record time to 15 minutes. Pamela Professional allows an unlimited record time and has a one time cost of \$24.95 (€19.95)

<sup>16</sup> Or other \*.mp3 player.

<sup>17</sup> WiFi: Wireless Fidelity. The current term for wireless Internet broadcast over certain standards like 802.11b, 802.11g, etc.

## **REFERENCES**

## **BIOGRAPHICAL NOTES**

Professor Wahlström teaches Construction Management courses at South Dakota State University (SDSU). He holds degrees in Civil Engineering and in Law and is a licensed Professional Engineer and Land Surveyor in New York. He retired from University of Houston in 2004. He also has extensive work experience as a Civil Engineer with the National Park Service. Professor Wahlström also presents preapproved Continuing Education courses to Texas Registered Professional Surveyors.

## **CONTACTS**

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