Case Study: Enhancing Residence Hall Electronic Check-in Training with Multimedia Video

Karen A. DeMonte

University of Delaware

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Abstract

A new Residence Hall Electronic Check-in system was implemented by Housing Assignment Services in August 2009 to replace paper-based rosters with web-based rosters. Hall Directors in Residence Life were trained on the system with face-to-face instruction. Unfortunately, the training did not accomplish the goal of teaching the system to the staff. Based on Clark and Mayer’s (2002) research on e-learning and multimedia design, an instructional video was created using Tech Smith Camtasia screencasting software. The following case study found local results to be similar to those in the scholarly research.
Background

Hall Directors working within University Residence Life units are hired for their strong skills in student advising, counseling, and program planning. While these skills are necessary to maintaining a positive living-learning experience for students in the residence halls, there are other secondary skills necessary to operating a residence hall. Organizational skills, for instance, are needed to handle administrative responsibilities, and technical skills, though not necessary, are recommended.

A new Residence Hall Electronic Check-in (e-check-in) system was implemented by Housing Assignment Services in August 2009 to replace paper-based rosters with web-based rosters. Using net books, when students move into their residence hall, Residence Assistants (RAs) update a web-based roster as keys are issued. The e-check-in system is designed to provide efficiencies on move-in day, reduce paperwork, and enhance record keeping. Additionally, Residence Life student staff is introduced to new, innovative ways to use technology beyond e-mail, spread sheets, etc. Before realizing the benefits of the system however, staff must be trained to understand both the mechanics and the underlying process.

Hall Director training takes place in mid-August prior to the start of the Fall Semester. Everything from fire drill safety to settling roommate conflicts is covered. I am allotted one half day to teach them the Housing Assignment Services’ administrative policies and procedures as they pertain to operating a Residence Hall. The Hall Directors receive training using Power-Point slide presentations and handouts in a face-to-face classroom setting. In August 2009, I introduced the Residence Life staff to the new e-check-in system for the first time. If the system
was to be deemed successful, it was vital that the Hall Directors adequately learn to operate and understand the system. Our goal in the first year was to have at least 50% of our residents checked in using the e-check-in system. Hall Director training on the new e-check-in system consisted of discussing the purpose of the system, the data behind the system, and reviewing the mechanics of using the system. The slide show presentation included static screen prints and basic written instructions were included in the Hall Director handouts. Using a discovery based learning philosophy, I asked Hall Directors to practice using the system on a test site with mock student scenarios. Unfortunately, the net books were not immediately available for a hands-on training. I also asked them to train their RA student staff

Overview

Resident Assistants (RAs) were afforded their first look at the new e-check-in system upon their arrival on campus. I asked that all RAs report to Housing Assignment Services to check-in rather than going directly to their residence hall. This allowed me an opportunity to provide an overview of the new system. After a brief orientation, they checked themselves into their residence hall using the e-check-in system. I then instructed the RAs to see their Hall Directors for more specific training and to work with them creating mock student scenarios. It was important that the Residence Life staff members practice using the system prior to Opening Day.

Instead of directing questions on the e-check-in system to their Hall Directors, RAs were contacting me directly in Housing Assignment Services as we moved closer to Opening Day. Unfortunately, it seemed few Hall Directors gained an adequate understanding of the system.
The majority of their questions and perceived problems were with the operation of the new system, not with design flaws. This is not surprising given that unguided instruction is normally less effective for anyone who does not have prior system experience (Kirschner, Sweller, & Clark, 2006). Since launching the e-check-in system, a need for an improved technical training plan became apparent. Unfortunately, we were only days away from the first students arriving on campus to check-in.

Literature reviews on the success of training videos using multimedia and cognitive load theory, worked examples, and principles of e-learning, led me to enhance their training by creating a video to supplement the face-to-face instruction that had already taken place. Fortunately, software programs such as TechSmith Camtasia make streaming video and screencasting tutorials relatively easy to create (Oud, 2009; Carr & Ly, 2009).

In consideration of time, money, and other constraints, creating short videos using Camtasia screencasting software seemed the most efficient and effective solution. Professionals in Library Sciences, Carr and Ly (2009), explained screencasting as a viable reference tool often used in academic libraries.

“Screencasting” is a method for capturing the actions performed on a computer, including mouse movements and clicks on web browser links, in the form of a video. Using online screencasting tools, the video can be shared via e-mail attachment or a web link, or be uploaded to a server for continual use (p. 409).

Using Camtasia, I created a training video based on multimedia learning and cognitive load theory. Design considerations were according to the principles set forth by Clark and
Mayer (2002) in their book *e-Learning and the Science of Instruction*. The video consists of several example-based instructional situations in which the Hall Directors and their staffs will likely encounter. Using these worked examples to provide step-by-step instructions on how to electronically check-in students, the learning process is expected to accelerate.

The purpose of this case study is to compare the local findings of the University of Delaware’s electronic check-in system training video with that which is in found in the scholarly research. I ascertain that learning improves when face-to-face instruction is augmented with on-line multimedia video.

**Multimedia Learning and Cognitive Load**

Multi-media presentations, defined as the combination of coordinated verbal and visual messages (Mayer, 2001), play an important role in professional training. Recent studies on using technology to support learning points out that interactivity makes it easy to revisit specific areas and explore them more fully (Bransford, Brown, & Cocking, 2000). Becoming familiar with hardware and navigating a new on-line system can be cognitively demanding for the Hall Directors and their staff not familiar with HAS Administration system. In *A Comparison of Cognitive Load Associated with Discovery Learning and Worked Examples*, Tuoviene and Sweller (1999) assert the following:

This (Cognitive Load) theory has proved beneficial for the improvement of the planning, organization, and implementation of learning in many fields. It is argued that in the process of dealing with information, working memory has only a limited processing capacity available to deal with distinct items at any given time and that the capacity of
working memory is often overloaded because of inappropriate presentation of material or inappropriate learner activities, leading to a reduction in learning and the capacity to solve problems. Thus, new material is learned most effectively and efficiently if the unnecessary cognitive load is reduced to a minimum (p 335).

**Worked Examples**

Mayer (2006, cited in Kirschner, Sweller, & Clark, 2004) concluded that the “debate about discovery learning has been replayed many times in education but each time, the evidence has favored a guided approach to learning” (p. 18). As noted, e-check-in is a newly developed system built within the current HAS Administration system. The previously referenced study conducted by Touvinen and Seller (1999) compared different modes of practice for students learning how to use a database program. This study correlates closely with this case study. The researchers compared the results of students using exploration practice (discovery based learning) against those using worked-examples practice (cognitive load theory). “The results of the experiment support the suggestion that in comparison to exploration, presenting students with worked examples assists them in learning to use a database program (p. 340). They went on to argue that the effectiveness of worked examples is dependent on students’ previous knowledge. With prior knowledge and experience, there is no difference in learning outcomes between students using exploration practice or guided practice (Touvinen & Seller, 1999). They concluded that “providing students with more rather than less structure is beneficial. This conclusion applies only to students with very little knowledge of the subject area. With more knowledge, the advantage of additional structure may disappear (p. 340).” In the case of the e-
check-in system at the University of Delaware, very few of the Residence Life staff members using the system will possess adequate prior knowledge and would therefore benefit greatly from worked examples.

_E-learning Principles_

In his work on multimedia learning Mayer (2001) identified research-based principles for the successful design of multimedia lessons. If well designed, he concluded that transfer and retention of information effectively increases. The basic premise of multimedia learning is to use word and graphics and then to arrange those words and graphics in such a way as to reduce cognitive load. In designing the e-check-in training video, listed below are the principles outlined in Clark and Mayer’s (2002) book on e-learning with a brief explanation of how they are incorporated in the e-check-in training video. Where principles are not included, a brief explanation follows.

1. Multimedia (use words and graphics rather than words alone): Screencasting of the system is supplemented with short, concise, explanations below each screen.

2. Contiguity (place corresponding words and graphics near each other): Throughout the video, text is aligned on the screen shots emphasizing particular points.

3. Modality (present words as audio narration rather than onscreen text): This principle is not included due to time constraints in the initial design phase. The designer also thought the narration could create a distraction when several staff members are viewing the video simultaneously. Instead, narrated words are
included at the bottom of each screen with the intention of stopping the video at the start of each section.

4. Redundancy (presenting words in both text and audio narration can hurt learning): Audio narration is not included.

5. Coherence (adding interesting material can hurt learning): The initial video does not include any audio. Background music was added in a test version of the updated Spring 2010 training video and later removed due to reasons cited in the literature.

6. Personalization (use conversational style and virtual coach): All the worked examples are actual students and real scenarios using informal language. A virtual coach is not included.

**Instructional Delivery**

In consideration of the large size of the training video file, using e-mail distribution was not suggested or even possible. Instead, the Electronic Check-in Training video was made available online. Every Residence Hall apartment and room is hard wired with internet access and every lounge is equipped with wireless local area network devises. Therefore, distributing the training video over the internet afforded the greatest amount of access for the Hall Directors and their Resident Assistants to view the video at the lowest cost.

Blended instruction is one of the various methods being used to deliver meaningful learning experiences. The use of blended instruction is growing rapidly because many believe
diverse delivery methods may significantly enhance learning outcomes and increase student satisfaction (Lim and Morris, 2009). Instruction on the E-check-in system is delivered first during a face-to-face Hall Director training module followed by the online asynchronous training video. The blended instruction approach provides several advantages. First, it allows the Hall Directors to get an overview of the system. Housing Assignment professionals are available to provide further discussion if needed during the face-to-face session. They can then review the system on their own with the online video and perform practice runs using the system. Knowing that different people learn at different rates, the video promotes learning at their own pace.

Whereas only the Hall Directors have access to the direct instruction modality, the online video expands training to the other Residence Life staff, including the Resident Assistants. As stated in a longitudinal study by Chen & Shaw (2006), "when conducting software training, it may be almost as effective to use online training (synchronous or asynchronous) as it is to use a more costly face-to-face training in the long term. In the short term face-to-face knowledge transfer model still seems to be the most effective approach to improve knowledge transfer in the short term (p. 99).” Based on the researchers’ findings, providing only the asynchronous training video to the Resident Assistants and other Residence Life staff provides an effective alternative to the face-to-face training.

**Case Study Methodology**

*Design*

The method employed was an intrinsic, non-experimental mixed-model case study designed to be primarily descriptive and somewhat predictive. The purpose was to describe the
learning outcomes of enhancing the face-to-face instruction with a multimedia training video for the newly developed Residence Hall Electronic Check-in system. Housing Assignment Services ascertains that learning improves when face-to-face instruction is augmented with on-line multimedia video. Insight into the level of knowledge gained from the multimedia video provides opportunities for future uses of multimedia learning for Residence Life. Though considered retrospective, the time frame of the study was late August during Residence Hall Opening Days and then throughout the fall semester.

Procedure

I provided all participants with instructions on using the e-check-in system in a face-to-face format. Hall Directors received initial training during their regularly scheduled Housing Assignment Services Training in mid-August. Residence Assistants received a similar training upon their arrival back on campus before checking into their rooms. Both groups also received a handout with instructions for logging on and checking in a student. Hall Directors and RAs were asked to initially use the system on a test site to become familiar with the e-check-in system. The intent was for them to create ‘mock’ scenarios and practice using the system from the face-to-face instruction and handout.

Just days prior to when the first students arrived on campus for early check-in, I e-mailed the URL containing the online Residence Hall Electronic Check-in multimedia training video (http://udel.edu/~kdemonte/echeckin/echeckin.html) to the Hall Directors. In my e-mail, I asked that they review the training video with their staff. This time I asked that they replicate the worked-examples from the video on the test site. They were directed to me for any additional
questions. For the actual check-in, all Hall Directors also received paper copies of the check-in rosters should they encounter problems using the e-check-in system. Heavy use of the paper roster would indicate that either the system did not function as intended or that the Residence Life staff was not properly trained on the system.

Participants

The participants for this case study were the Hall Directors and Resident Assistance at the University of Delaware responsible for checking-in students to the Residence Halls using the new e-check-in system. Convenience sampling was the appropriate sampling frame for this study. Due to practical constraints, Housing Assignment Services preferred convenience sampling because the participants were readily available and easy to identify. There were a total of 32 Hall Directors and 188 Resident Assistants checking-in students at any given time from which to observe. The focus group was comprised of members of the Hall Director Advisement Team, and the questionnaire was distributed to all Hall Directors.

Measures

Under a mixed model, I collected both quantitative and qualitative data. The quantitative data collected consists of simple counts of students who were checked-in using the new e-check-in system verses signing the paper roster. Qualitative data was collected through both observation and a short questionnaire. Based on convenience sampling, I visited 12 of the 28 check-in locations during early check-in and observed how well the system was utilized and understood. In mid-October, I e-mailed a short questionnaire to all Hall Directors.
Results

Quantitative Results

Overall, a total participation rate of 61% (see table 1) was recorded denoting the percent of students who did not use the paper roster and were checked-in to the residence halls using the electronic check-in system. A goal of 50% was established to deem the project a success. A closer examination of the data reveals that the range of success ranges dramatically between the individual areas from a low of <1% participation to full participation indicating differences in training and preparedness by the staff checking in the students.

<table>
<thead>
<tr>
<th>Check-in Location</th>
<th>% students</th>
<th>e-check-in</th>
</tr>
</thead>
<tbody>
<tr>
<td>BRH/SYP</td>
<td>53%</td>
<td></td>
</tr>
<tr>
<td>CAN/NCH/KNT</td>
<td>74%</td>
<td></td>
</tr>
<tr>
<td>CET/CWT</td>
<td>13%</td>
<td></td>
</tr>
<tr>
<td>DKA/B</td>
<td>&lt;1%</td>
<td></td>
</tr>
<tr>
<td>DKC/D</td>
<td>83%</td>
<td></td>
</tr>
<tr>
<td>DKE/F</td>
<td>1%</td>
<td></td>
</tr>
<tr>
<td>GRN</td>
<td>89%</td>
<td></td>
</tr>
<tr>
<td>GRS</td>
<td>96%</td>
<td></td>
</tr>
<tr>
<td>HHA/B</td>
<td>99%</td>
<td></td>
</tr>
<tr>
<td>HHC</td>
<td>98%</td>
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</tr>
<tr>
<td>HHD/E</td>
<td>82%</td>
<td></td>
</tr>
<tr>
<td>HRT/SHH</td>
<td>&lt;1%</td>
<td></td>
</tr>
<tr>
<td>IHE</td>
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<tr>
<td>LNE</td>
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<tr>
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<td>15%</td>
<td></td>
</tr>
<tr>
<td>RDC/D</td>
<td>86%</td>
<td></td>
</tr>
<tr>
<td>RDE/F</td>
<td>&lt;1%</td>
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<tr>
<td>RHA/B</td>
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<tr>
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<tr>
<td>RHD/E</td>
<td>72%</td>
<td></td>
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<tr>
<td>RYA/B/C</td>
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<td></td>
</tr>
<tr>
<td>SMY</td>
<td>99%</td>
<td></td>
</tr>
<tr>
<td>SXH/SQR</td>
<td>94%</td>
<td></td>
</tr>
<tr>
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<td>70%</td>
<td></td>
</tr>
<tr>
<td>TMK</td>
<td>99%</td>
<td></td>
</tr>
<tr>
<td>WRN</td>
<td>87%</td>
<td></td>
</tr>
</tbody>
</table>

Grand Total | 61%

Table 1: Percent of students checked in electronically at each check-in location.
Observation Results

I observed how well the staff fared with the e-check-in system at ten random locations visited during early check-in. I chose to perform the visitations at this time because there would be fewer students and opportunity to ask questions if needed. Also, my hope was to impress upon them the importance of the training prior to Opening Day and to emphasize the notion of practice with the staff. This was their first opportunity to truly test their skills with the new system. During my visits, I simply asked the staff working how things were going and if they had any questions. I also asked who had watched the video. All the RA staff had been exposed to the system at least once when they checked in themselves at Housing Assignment Services. The Hall Directors, however, were expected to access the system on their own.

One site visited had hardware problems that were resolved the next day. Judging by the results of the empirical data, 74% of their residents were checked in electronically indicating that they did use the system correctly. Two locations had considerable difficulty working with the e-check-in system. They seemed completely lost. When questioned, they admitted that none of them viewed the training video or did any practice on their own. Though not planned, the participants at these locations essentially served as the control group. Additionally, their experience highlighted the ineffectiveness of the face-to-face training.

Overall, the staff who watched the training video did well. The ones who admittedly did not were confused on what they should have been doing. The locations where the entire staff viewed the video together did the best; they were confident, at ease, and were able to problem solve. Viewing the video and working though the examples, they felt prepared for any situation.
Also fairly successful were those where part of the staff viewed the video. In these cases, staff members who viewed the video were able to help those who did not.

Results from the quantitative study (see table 1) substantiate the effect the video had on their usage rates. The nine locations where the staff reported to have had viewed the video produced an average of 85% of their residents checked-in with the online system. Not surprisingly, the locations who did not view the video showed a <1% percent usage rate of the online e-check-in system and relied almost solely on the paper roster.

*Questionnaire Results*

A short, open-ended questionnaire was sent to the Hall Directors in October regarding the Electronic check-in system. They were asked what aspects of the training materials (face-to-face instruction, hand-outs, and training video), were or were not helpful and what changes are suggested. An analysis of responses clearly favored the video over the face-to-face instruction. The video received all positive comments, whereas the face-to-face instruction received all negative comments. Very few comments pertained to the handout.

Clearly the face-to-face instruction was not satisfactory to the majority of the respondents. Many felt the training was “insufficient,” “confusing and frustrating,” and “unhelpful.” A complete review of the face-to-face training session is highly recommended. As if in response, one person suggested a more in depth training session would be beneficial in order to learn how to work through the system if something went wrong. It was also suggested that the face-to-face training be utilized to review any lingering questions about the system. These suggestions will be taken into consideration.
To say the video was well received would be an understatement. “The most helpful thing for me and my staff was the video; very well done, easy to follow and understand.” While the majority of the comments on the face-to-face training were negative, the response to the video was overwhelmingly positive. The respondents all rated the video extremely helpful and even went on to suggest that the “face-to-face training is not necessary since the video is so involved”. Hall Directors reported that they “liked that their staff could view it over and over again” and “that it had everything they needed.”

Things to contemplate in planning future training include distributing the video instruction earlier in the training process. Hall Directors may benefit from reviewing the video asynchronously on their own prior to face-to-face instruction. Alternatively, another option to consider is incorporating the video directly into the slide show presentation for synchronous viewing.

A suggestion was also made to improve the video itself by including narration in the video. Only one person commented on the lack of narration, but others questioned the lack of audio during the location visits. Fearing a problem with redundancy, further discussion with the Hall Directors on their preference of audio or text narration should occur. Including both could result in a negative outcome (Clark & Mayer, 2002).

Discussion and Recommendations

The question still remains, does learning improve when face-to-face instruction is augmented with on-line multimedia video? If we use one of our initial indicators that success of the project is based on how many residents were checked in using the e-check-in system and not
the paper roster, then the answer is ‘yes, learning improved.’ However, there is also a question of internal validity present due to extraneous variables impacting the results. Hardware problems, system response time, strength of wireless connections, etc. could also explain differences in the results. One questionnaire respondent referred to problems with dropped connections. It is possible that students were checked in using both systems. Even with internal validity issues, the assertion that the system was not used correctly is still supported indicating that staff were not properly trained or prepared.

I believe a better predictor is the difference in the variance of success between the locations that did well verse those that did not. When viewing the statistics in conjunction with the observed findings during the early check-in visits, certain conclusions are made. Using the percent of residents checked-in with the online e-check-in system as an indicator of success, the locations where some or all staff viewed the video averaged 85%. Whereas where the video was not viewed, almost 100% of the students were checked in using the paper roster. Therefore, I conclude that the local findings at the University of Delaware reflect those in the scholarly literature and that multimedia video enhances the learning process.

One last point I wish to consider in developing training modules. The face-to-face instruction with the Hall Directors was reported to be ineffectual. Furthermore, it appeared from both observations made and comments received from the Hall Directors, that the RAs had a better overall grasp of the system. Recalling that the RAs were not included in the face-to-face instruction but instead only had a short hands-on orientation, an alternate conclusion can be made. It is possible that the face-to-face instruction as presented created confusion to the point
that the Hall Directors needed time away from the system entirely before gaining an understanding presented in the video. The decision not to view the video could have been the result of frustration. Though I remain convinced of the benefits in teaching using multimedia video, reversing the order of the presentation likely deserves further investigation.
References


http://proxy.nss.udel.edu:2104/gtx/start.do?prodId=AONE&userGroupName=udel_main

http://proxy.nss.udel.edu:2104/gtx/start.do?prodId=AONE&userGroupName=udel_main


