

# **iLearning and eHomeStudy: Multimedia Training and Assessments for Field Survey Staff**

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## **ABSTRACT**

Survey data collection projects strive to collect high quality data from survey respondents. The quality of the data collected is greatly dependent upon the effectiveness of field interviewers (FIs) to conduct in-person screenings and interviews. Training FIs and subsequently assessing their knowledge of project protocol, methods and interviewing techniques is critical to the overall success of any data collection effort. For large surveys, as the number of FIs increase, the cost of in-person training can become prohibitively large.

As a cost effective solution to increase the quality of the field data, we developed a suite of web and media based training and assessment tools called iLearning and eHomeStudy for training field staff. Besides saving the project costs associated with in-person training, we are also able to provide refresher trainings throughout the year. This application also enables FIs to view standardized training courses at their convenience and at their own pace. This paper describes the technical details, key features and benefits of this application suite, and also it includes some details on user satisfaction and future directions.

**Keywords:** Survey, data collection, training, assessment, multimedia, web.

## **1. INTRODUCTION**

Each year public, private and government entities spend significant resources collecting survey information pertinent to their business practices. The information collected is a key factor in the making

policy, budget, resource allocation, purchasing decisions and the likes. Obtaining quality data is therefore essential to organizations relying on the information collected.

In-person survey data collection efforts require field interviewers (FIs) to go door-to-door to interact with respondents to gather data. Existing research on survey methodologies, show that computer-assisted self-administered interviewing (CASI) provides a means to increase data quality in the self-administered survey format [1]. Self-administered questionnaires have been used to provide response anonymity and privacy while answering sensitive questions in a survey. The need for computers and associated software in administering the CASI necessitates technical training of the interviewer on hardware and software, project protocols, refusal conversion and other survey methods. The social and survey related skills of the interviewer now needs to be supplemented by CASI related skills to realize the improved data quality and the cost benefits. It is important for the organization to ensure that the field interviewers maintain a minimum level of competence in their interaction with the respondents, which also helps to increase the response rate.

This paper draws on the example of a large nationwide field survey (referred to as NFS) conducted annually by RTI International (*RTI International is a trade name of Research Triangle Institute, RTI*). For NFS, RTI collects interview data from several thousand respondents in all 50 states

and the District of Columbia. To accomplish this task, RTI must train several hundred FIs each year.

It is easy to see that the FI role is critical to the success of any in-person survey collection effort and because of the influence the FI can have on survey data quality, individuals functioning in this role must meet minimum proficiency standards. As the size of survey efforts grow, the amount of resources (staff, money and time) needed to conduct in-person training and assess field staff knowledge can become prohibitively large.

For the NFS project, some of the largest expenses associated with in-person training include: hotel and travel accommodations, per diem meal expenses and the coordination and reservation of conference space. In addition, make-up training sessions must be offered to individuals unable to attend the main training sessions.

To evaluate each FIs grasp of project protocols and methodologies, paper based assessments were used. Field staff completed the tests then mailed them back to RTI. The assessments were manually graded and only staff that met the minimum criteria were allowed to continue on the project. Despite an overall satisfactory score if a competency weakness was detected, remedial measures were then taken during training.

## 2. ILEARNING AND EHOMESTUDY

In response to the challenges faced on the NFS, we developed the iLearning and eHomeStudy suite of applications. The goals were to reduce training costs, improve the prospects of collecting quality data, supplement in-person training, provide refresher trainings throughout the year and automate the field staff assessment process.

### iLearning

The iLearning application was designed to be easily configured to display any web-based content. Thus, training course content can take advantage of any web content reachable locally or through an internet connection. iLearning separates function from content to enable training topics to be developed independently of the application. Content display and function is controlled through XML input files. Figure 1 shows the iLearning client interface.

Further, content can include multi-media tools such as images, interactive graphics, audio and video.

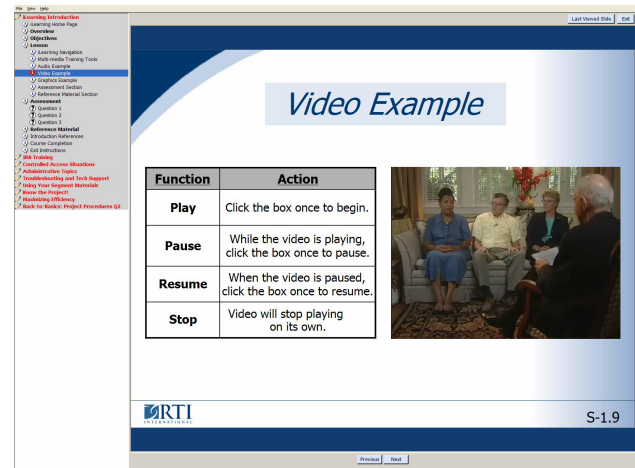


Figure 1. iLearning client interface

For each content slide, the application tracks number of visits, visit duration and maximum visit duration. iLearning also tracks and reports scoring on assessment questions. As courses are completed, progress and status information is stored in Microsoft SQL server databases. This status information is then posted to RTI's intranet where management staff can query and view results. Figure 2 shows the iLearning results page.

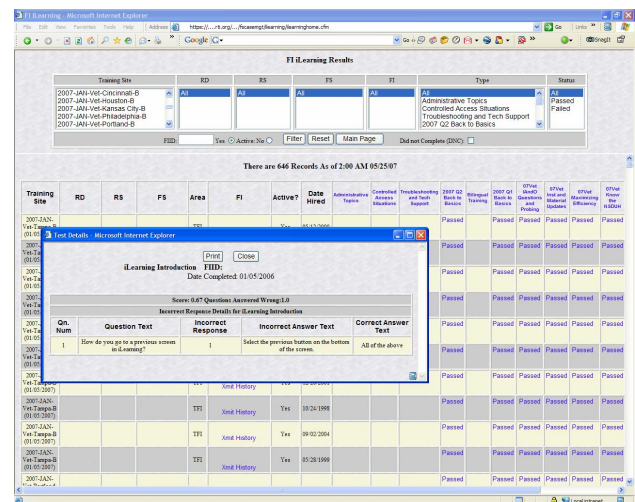


Figure 2. iLearning results web page

The iLearning application was made available for deployment as a web or media (CD/DVD) based application.

**Media-based iLearning:** Media based iLearning is a windows based application. It was

designed to be deployed to field staff without (reliable) internet connectivity. Because the NFS project supplies laptops to all FIs, the media based iLearning is more convenient for current field staff. New iLearning training course media is periodically mailed to FIs to provide new training content.

**Web-based iLearning:** Web based training courses are very similar to the media based courses except with limited video and audio features. Since this application could be accessed from any computer connected to the public internet, minimum bandwidth limitations were taken into account on the usage of graphics and multimedia.

**eHomeStudy assessments**

After the iLearning courses are completed, FIs are evaluated to ensure that they meet minimum requirements using the eHomeStudy assessment tool. Figure 3 shows a question on the assessment test. The home study assessment application is a client-server type web-based system which users can access through any web browser.

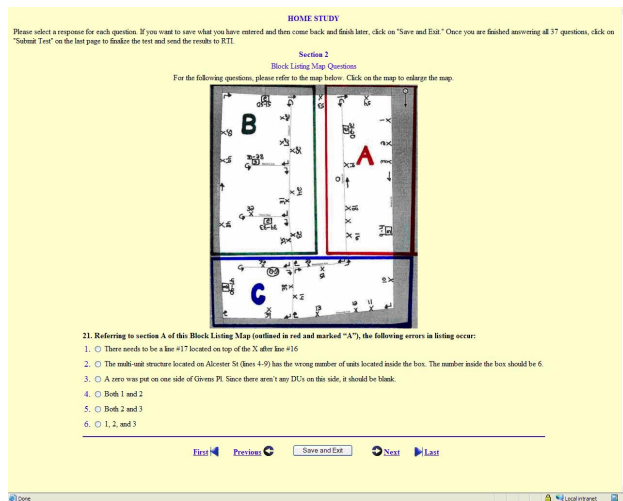


Figure 3. eHomeStudy assessment tool

The users are allowed to take the eHomeStudy test in one or many sessions. The web interface records the progress and status of each user in the SQL Server database.

For data security, both the web applications allow only authorized users. As users complete the web-based iLearning and eHomeStudy assessments, their management team is notified of the results via email. Management staff then has the opportunity to make hiring/terminating decisions or one-on-one coaching to those individuals needing assistance.

Figure 4 shows an example of the eHomeStudy results web page.

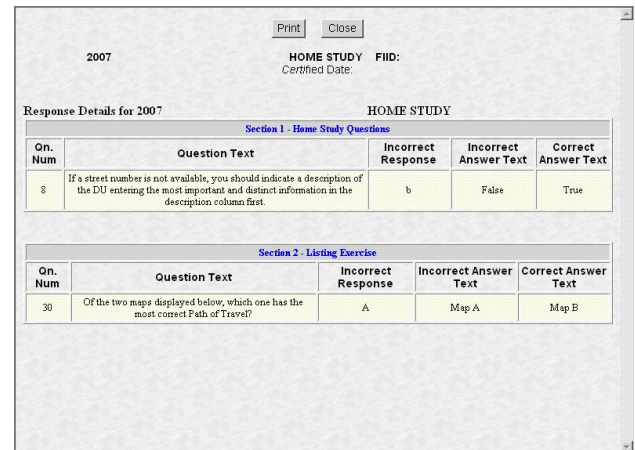


Figure 4. eHomeStudy Results web page

**3. KEY FEATURES**

- Courses deployed on public web site or on DVD/CD.
- Delivers multimedia (images/audio/video) to enhance training content.
- Flexible framework for including content (XML input).
- Tracks number of visits, visit duration and maximum visit duration per slide (XML output)
- Enforcing sequenced access to content is easily configurable.
- Tracks assessment results.
- Details about browsers and connection speeds captured.
- Some feedback questions to gain insight on user preference were included.
- Take full advantage of computer technology already in the hands of each field staff.

**4. IMPLEMENTATION DETAILS**

Figure 5 shows the technical infrastructure supporting the iLearning and eHomeStudy tool suite. Both the iLearning website and the eHomeStudy assessment web sites are hosted on RTI's corporate web server cluster.

The iLearning application was designed to take advantage of Asynchronous JavaScript and XML (AJAX) to render content over the web while

maintaining the feel of a desktop application. As users navigate through content, progress is asynchronously maintained. iLearning's backend, or server side, components were developed using ASP.NET (Visual Basic) and user progress and status is stored in Microsoft SQL server. The application was also ported (VB.NET) to a windows based application for media based deployment (CD/DVD) for users who do not have (reliable) web connectivity.

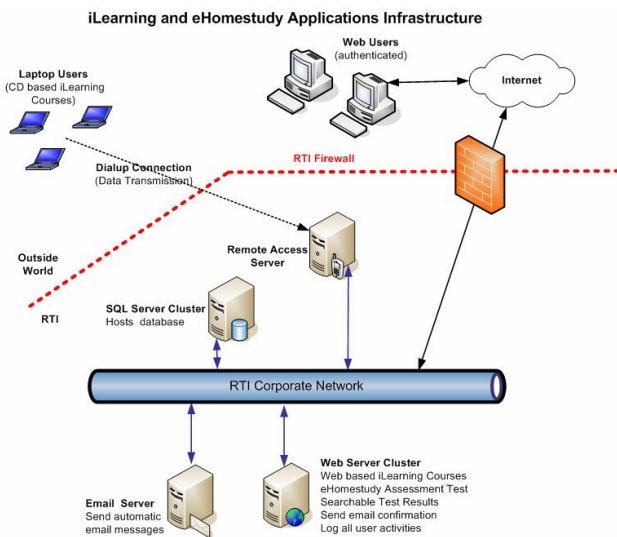


Figure 5. Technical infrastructure

The eHomeStudy user interface was developed using a combination of ColdFusion, HTML, and client JavaScript technologies. Microsoft SQL Server serves as the backend database for eHomeStudy and iLearning applications.

## 5. BENEFITS

- Reduce costs and fatigue associated with in-person training.
- iLearning provides refresher trainings throughout the year.
- iLearning enables FIs to view training courses at their convenience and at their own pace.
- Standardizes delivery of training content.
- Facilitates rapid, on-demand deployment of high quality training programs.
- The web based systems allow multiple users to use the system simultaneously from any location with internet access. Users do not have to install any specific software in their computers to access the system.

- Web-based iLearning and eHomeStudy assessments allow management to obtain content, progress and certification results immediately.
- Cost effective, as project staff need not grade each test and enter each listers results into Case Management System and provide feedback to each supervisor concerning questions missed and other details.
- The certification scores and results are helpful in making hiring/terminating decisions It alerts project staff in advance about interviewer candidates who may need additional attention during training.
- The online certification process helps to identify interviewer candidates who are not committed to the job so they can be released prior to attending costly training sessions.
- Using these distance learning suite, NFS was able to reduce budgeted training expenditures by approximately 65%.

iLearning Feedback Item	Strongly Agree or Agree	Neither Agree nor Disagree	Disagree or Strongly Disagree
Screen text was easy to read	99.3%	0.16%	0.49%
Audio was clear & easy to understand	96.1%	2.92%	0.97%
User-friendly	95.8%	2.76%	1.30%
Effectiveness	92.9%	6.48%	0.65%

Figure 6. Preliminary iLearning FI feedback

## 6. USER FEEDBACK

Early response from FIs to the suite of applications was very positive. As shown in Figure 5, the feedback we received was affirmative. Most of the negative feedback was balanced with positive feedback. For example, many users did not enjoy the non-classroom training citing that they missed the chance to learn from classroom interactions. On the other hand, other users were excited to be able to train at their own pace, from the comfort of their living room.

Accessing the internet did not prove to be a problem. 99% of staff completed the eHomeStudy using the web application and only one had to use back-up paper option. Staff showed interest in further online training. Overall, iLearning and eHomeStudy experience was positive.

## **Observations**

It is interesting to note 80% of the people accessed the web based applications from their home computer. Almost 90% of the users used Internet Explorer to access the site. About 66% of the field staff used broadband connections while the rest connected through dial up modem. 85% of staff indicated that they prefer further on-line training. Only 10% staff indicated problems accessing the website due to lack of internet connection nearby.

## **Challenges**

As with all web based applications, it was challenging to design and develop these applications to be compatible with different operating systems such as Windows and Macintosh, various connection speeds and a variety of browsers like Internet Explorer, Firefox and Opera. Very careful considerations and thoughts were given on content to avoid errors and inadvertent misconceptions. Applications were tested in many settings like public library and rural areas.

## **7. FUTURE**

We hope to combine iLearning training and eHomeStudy into one application. This will provide a centralized, web-based system for disseminating training content and tracking field staff assessments. Based on user feedback, we may enhance iLearning to include a message board feature allowing users to post questions/messages for discussion and feedback from peers and management. We also have plans to expand web-based iLearning to provide separate user roles to give management the ability to tailor and personalize training content per FI.

## **8. CONCLUSIONS**

We have demonstrated that web based technologies can be effectively used to train survey personnel remotely, assess the effectiveness of communication and plan timely supplementary measures if necessary, all the while reducing cost.

## **9. ACKNOWLEDGEMENTS**

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## **10. REFERENCES**

- [1] Debra L. Wright; William S. Aquilino; Andrew J. Supple, "A Comparison of Computer-Assisted and Paper-and-Pencil Self-Administered Questionnaires in a Survey on Smoking, Alcohol, and Drug Use", *The Public Opinion Quarterly*, Vol. 62, No. 3. (Autumn, 1998), pp. 331-353.