

CAPI Training: Where Do We Go From Here?

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In his opening address to the attendees of the Federal CAPI Development Conference, hosted by the Bureau of Labor Statistics in March, Mick Couper suggested that it was time to shift the way that we think of CAPI. He argued that we have proven CAPI to be a feasible technology and now need to shift our attention to the development of methods that will provide for the optimal use of CAPI. The focus of this paper is to build upon this idea as it applies to the training of interviewers to use CAPI. In 1991, we co-authored a paper entitled *Training Field Interviewers to Use Computers: A Successful CAPI Training Program* (Wojcik, Bard, Hunt 1991) outlining a training model used on Round 12 of the National Longitudinal Survey of Labor Market Experience. Since that time, the model described in the paper has been used numerous times by a variety of survey organizations. The one shortcoming of the model described is that it is intended to train only novice CAPI users (since there were very few CAPI experienced interviewers at that time). However, now that field interviewers are becoming more familiar with both the use of computers and CAPI, it is time to adapt the model to allow for the training of CAPI experienced staff. The first goal of this paper is to offer some suggestions for making this type of adaptation.

Furthermore, with the increasing interest in Total Quality Management (TQM) that is being shown in the survey research industry, it is also a good time to demonstrate how easily the model lends itself to the principles of TQM. It can be argued that one of the key principles of TQM, which emphasizes errors in the system, rather than in individuals, is even more important when applied to the CAPI process. Since the CAPI system involves components in remote locations across the country, the early identification and resolution of systematic problems is key to the success of the overall effort. The second goal of this paper is to suggest ways that the TQM process can be applied to the training model to yield data that will facilitate improvements in the overall process.

The remainder of this paper will focus on three specific topics, each related to the goals mentioned above. Specifically, these topics are:

- Increasing the use of self-study materials for interviewers who have already received CAPI training (either for another project or for earlier iterations of the same project)
- Using scripted mock interviews during the training and using the data they provide as a standardized means of evaluating interviewer performance
- Implementing a procedure that allows the CAPI training process to generate data that can be used to evaluate the training as part of a Total Quality Management project.

Increasing the Use of Self-Study Materials

Before beginning this section, there are several points that require some clarification. First, it is important to note that we are not suggesting an increase in the use of self-study materials for first-time CAPI trainees, but rather for trainees who have already received an initial CAPI training. While the use of some very simple self-study material is useful before an initial CAPI training, relying too much on self-study can be extremely dangerous. As stated in the 1991 paper, one of the main objectives of any initial CAPI training is to overcome the fears that interviewers have about working with computers. During the initial training, this is best accomplished through in-person training. Recent experience of the Census Bureau on the NHIS survey supports this argument (NCHS Workshop, 1992).¹ However, we would argue that by the time an interviewer is attending a follow-up (or second-level) CAPI training, he/she has already used CAPI in the field and is now familiar enough with the computer to have overcome these initial fears. It is only at this point that self-study materials offer a feasible and more economical means of training.

¹The Census Bureau reported that they attempted to use a computerized tutorial as part of the training for the NHIS. The tutorial program was loaded into the computers and sent to all trainees before the in-person training. Their results were not as positive as they had hoped, due to the difficulty associated with trainees' lack of familiarity with the hardware and software.

The second point that needs to be made is the difficulty associated with defining a CAPI experienced interviewer. Since the CAPI programs used by different organizations vary widely, experience that an interviewer has gained by working for one organization may not translate to another. Therefore, interviewers with CAPI experience for one organization may be considered novices when working for another. Hopefully, as the CAPI methodology continues to evolve, organizations will work together to develop a degree of standardization that will allow CAPI experience an interviewer has gained to transfer more easily among agencies. We urge cooperation among agencies to make some degree of standardization possible. However, right now, this is not the case. Therefore, at the present time, we would define a CAPI experienced interviewer as one who has completed a previous training for a previous project, for the same organization, using the same CAPI software. While this definition is rather constraining, we believe that the current differences in conventions and procedures among the various CAPI programs that are available are significant enough to warrant a great deal of caution.

In any case, we can assume that there is, or soon will be, a pool of interviewers who can be considered CAPI experienced. In order for CAPI to be a truly cost effective means of data collection, it is important that we develop a means of training this group of interviewers from their homes. On paper and pencil studies it is not always necessary to bring all interviewers to a central location for in-person training after they have completed an initial training session. Much of their follow-up training is achieved by means of self-study materials. We must find a similar means for CAPI, or the training costs associated with its implementation will continue to be significantly higher than those associated with paper and pencil interviewing. As stated by Bradburn, et. al. (1991)

The cost for CAPI and PAPI cases are differently distributed, with training costs being higher and data processing costs lower for CAPI as compared to PAPI. These are cost differences that will persist by mode even after the mode is firmly established and in place, although CAPI training costs may come down somewhat as more interviewers become generally familiar with computers.

It is only by using the self-study method to train CAPI experienced interviewers that we can make significant

progress in decreasing the costs associated with CAPI training.

We believe that there are two types of self-study materials which will yield the best results with this group. The first is the computerized tutorial, supported by a series of manuals and exercises, not unlike those provided with many off-the-shelf software packages. In this sense, we think the Census Bureau deserves credit for attempting something that none of the rest of us have tried; attempting to apply a computerized tutorial as part of a CAPI self-study training package. Their work, although not as successful as they would have liked, is, nonetheless, a very valuable starting point. We believe that the use of this type of training material, when properly developed for use with CAPI experienced interviewers will produce much more encouraging results than those obtained during the initial NHIS experience.

The key to the success of the tutorial is based on the proper development of both the tutorial program and any supporting materials that accompany it. All too often, the majority of the effort on these types of projects is focused on the tutorial itself, and the supporting materials are an afterthought. We would argue that the development of written materials should be emphasized first, leaving the tutorial program to reinforce their content by providing concrete examples. We would further maintain that the level of effort required for the development of the written materials should be at least equal to that associated with the development of the tutorial. We believe that this shift in emphasis, simple as it may seem, will result in a far superior product.

The second type of self-study material that we believe will yield improved training results is the training video tape. We have all used video tapes to train interviewers, yet, have not incorporated them into the CAPI training process.² Portions of the CAPI training model described in our first paper lend themselves very nicely to the use of video. For instance, a great deal of the training on the use of the specific CAPI hardware can be recorded on tape and sent to interviewers for review. This is especially important if the hardware they are to use differs from that which was used on previous studies. However, even if the hardware remains the same, the video can serve as a reminder to the interviewers.

Video also offers the opportunity to provide many of the demonstrations that are such a vital part of the CAPI training. For instance, a video tape presentation of select CAPI screens, accompanied by a voice-over explaining the

²In response to a question from the floor at the NCHS CAPI Training Workshop, every participating agency stated that they had not incorporated the use of video tape into their CAPI training.

Using Scripted Mocks In CAPI Training

proper procedures to follow, can be extremely valuable as a home study tool. Furthermore, a video of this type allows each trainee to proceed at a pace that is comfortable and to rewind the tape to review procedures that present special problems.

Also, as the CAPI method is more widely used, we will begin to see the need to simultaneously train larger numbers of interviewers. Since the optimal trainer to trainee ratio is rather small (See Wojcik, Bard, and Hunt, 1991 for discussion), it is only possible to train larger numbers of trainees with a larger number of trainers. Unfortunately, that makes it more difficult to standardize the delivery of material across all training groups. Video offers a solution to this problem. By using a training video we no longer have to rely on the individual trainers to deliver all of the material in a standard way. Rather, they simply need to show the same video.

The final advantage to the use of these materials is that they can be used, if properly developed, on many different projects. For instance, if the screens that are used in the software demonstration are generic enough and represent the types of questions that are asked (regardless of the actual subject matter) the video can be used on any CAPI project using the same software. While the content of the questions may vary from study to study, the basic format of the screens and procedures for answering questions should be consistent across projects. If this proves to be the case, project-specific modules can be combined with these "generic" CAPI modules to produce an extremely effective self-study training program.

On its own, the use of self-study video tape could greatly improve the quality of a training. When used along with the computerized tutorial described above, the potential gains are tremendous. It is our belief that the most effective CAPI self-study package that can be produced will blend these two techniques into a package that is easily used by the interviewer from his/her home, thereby decreasing the expense associated with training.

The primary argument against the use of either video-based or computerized tutorial-based training is the significant cost associated with their development. While it is true that they may not be cost effective for extremely small surveys, they certainly should be cost effective on larger ones. Furthermore, the costs associated with the production of these materials is still far less than the costs associated with an in-person training. Finally, the initial capital investment in these materials can be amortized across several projects because they can be re-used with little, if any, change. Ultimately, it is up to each of us to establish guidelines for when these training methods are cost effective and when they are not. However, we should be able to establish some general guidelines for doing so.

One of the key components of the CAPI training model is the use of scripted mock interviews to provide hands-on training for interviewers in the controlled training environment. Since writing the first paper, we have encountered a number of people who have said that they prefer to use "mock" respondents with no script during the practice interviews. "Mock" respondents are people who are usually screened to participate because they share most of the characteristics of a survey's sample population. We would like to take this opportunity to make several arguments in favor of the use of the scripted mock interview, both in terms of its own merits and in terms of tying it into the Total Quality Management philosophy.

Our first argument in favor of the scripted mock interview concerns the level of control that it offers to the training development team. By carefully scripting the mock interviews, the training team can assure that each item in the questionnaire is touched upon during the training. This is especially important in a CAPI training, because some questions may require unusual procedures for the entry of response data, and skipping these questions during training can lead to unpleasant surprises in the field. In contrast, while the "mock" respondent may create a more realistic interview, the training staff does not exhibit the same level of control over the responses. The path through the questionnaire is determined by the respondent at the training, making it extremely difficult, if not impossible, for the training development team to control. Thus, key items, or even entire sections, in the questionnaire may not be sufficiently covered during the training session.

Second, because the training development team knows the correct responses to each of the mock interviews, it can take steps to gauge the performance of the trainees. For instance, an electronic answer key can be created and a program developed to compare the responses from each of the trainees to this key. Because all of these data are available electronically, we foresee a day when trainees will complete a mock interview, transmit it to the office and receive feedback on their performance (in the form of a standard report) during the next day of training. Again, this is not possible with the use of "mock" respondents because there are no scripted responses to use in the development of an answer key.

While this evaluation is extremely important during and in-person training, its benefits are greatly amplified for a self-study training. Very often, the lag time between the completion of self-study material and any feedback on performance is considerable. The beginning of data collection may lag by several weeks while the results of the self-study materials are mailed to the office and reviewed and

feedback is relayed to the interviewer. By using CAPI and automating this process the results are, once again, better quality data with quicker turn-around. Thus, the study can begin data collection much closer to the end of training. While it can be difficult to measure the cost savings associated with this reduction in time between training and data collection, we think everyone will agree that it is a tremendous advantage.

Although we have not yet implemented it on any project, NORC is currently working on such an evaluation system. We know of no one who is actually using this type of evaluation system although the technology it requires is readily available. As we begin to focus on the usability of CAPI, we believe that this type of evaluation system will become an integral, and hopefully required, part of any CAPI training design. In any case, we believe that it is only a matter of time before we see this type of system in use.

We do want to add one word of caution about adopting this process. In order for it work properly it is imperative that each and every trainer follow the mock script exactly as it is written. Often times, an experienced trainer, in an effort to stress a particular point, will stray from the mock script in minor ways, sometimes altering the end product. This cannot happen within the system described above. Any deviation from the mock script will result in responses that differ from those in the answer key. However, if the evaluation system is properly developed we should be able to determine that the deviations were due to trainer error and not errors on the part of the trainees. Needless to say, this is also extremely valuable information.

We believe that trainers will follow the guidelines provided to them if they are furnished with a proper description of the process and the benefits it offers them. Thus, by demonstrating the type of data which is being collected and analyzed we should be able to convince any trainer of the advantages that the model offers and get them to "buy in" to its use.

Finally, it is important to perform quality control checks on the scripts for the mocks. While any errors in the mocks will be identified by the procedures outlined in the next section, their detection will occur after the fact, at the expense of the trainees. We propose a very simple method to perform this quality control review. Simply entering the responses from the mock script into the CAPI program before the training will identify any problems that exist in the script early enough to correct them before training.

Balancing Interviewer Techniques and Technology In the Training

One important point that we cannot lose track of as we progress with the development of CAPI training is the very

essence of what we are doing. For some time we have argued that we are not attempting to train computer users but, rather, are attempting to train interviewers to use computers. While the difference between training a computer user and an interviewer who is using a computer may be subtle, it is very important to remember. Therefore, it is important to maintain the proper balance between training on the use of the CAPI technology and training on interviewer technique. In using video, computerized tutorials, and scripted mocks we must be sure to reinforce proper interviewing technique in such areas as proper probing, interview pace, eye contact, and maintaining rapport with the respondent. Very often this is the largest challenge for the design time which gets caught up in the new technology and loses sight of the ultimate goal.

Again, we believe that the scripted mock interview offers the greatest opportunity to reinforce proper interviewer behavior. As designers, we can build responses that require probes into the scripts of the mocks. We can include notes to the trainers to pay attention to the pace of the interview and the development of rapport at certain points in the script. For difficult or confusing questions, we can build references to the question-by-question specifications into the script. In short, any item or procedure that is important to the training of interviewers on paper and pencil (and that has not been eliminated by the implementation of CAPI) must be incorporated into any successful CAPI training.

Applying Total Quality Management Techniques to the Training Process

Finally, while we are not experts in Total Quality Management, we can see how the use of these electronic answer key files can also provide valuable data to any Total Quality Management initiatives that may surround CAPI training. While the focus of the effort must, by definition, shift from the performance of the individual interviewer to the overall performance of the system, valuable data can be obtained from this same source. In fact, this process is being tested in a feasibility study as part of the training design for the Round 15 of the NLS. We hope to be able to report on our specific findings at a later date.

In any case, we can offer the following few examples to illustrate how this application could be performed. Please keep in mind, that the examples that follow are not based on actual data and are for demonstration purposes only. In our first example, we compile the evaluation data from all of the trainees and look at the error rates on specific questionnaire items (Figure 1). In doing so, we are able to identify areas where either the data collection instrument or the training are not performing up to expectations, and make the required revisions very early in the process.

Error Rate by Questionnaire Item

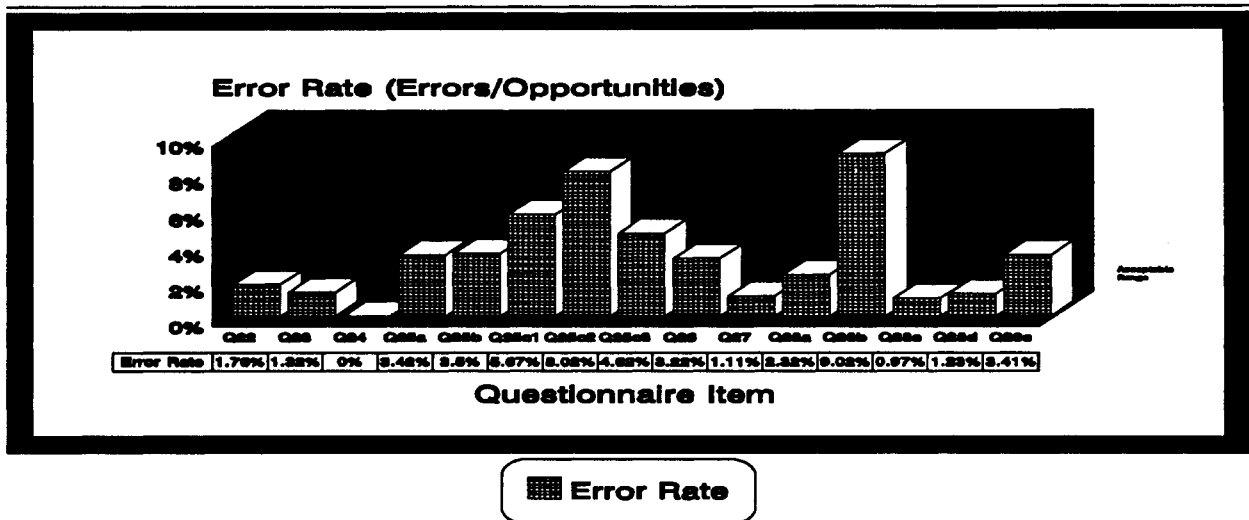


Figure 1: Sample Pareto Distribution: Error Rate by Questionnaire Item

In our example, we arbitrarily set our acceptable error rate as less than or equal to 4.5% (although over time we could come up with a more precise measurement of our expected error rate by using actual data from previous iterations). With that in mind, we can see that there are several questions (Q25c1, Q25c2, Q25c3, and Q28b) that are not within the acceptable range. We can now look at those specific questions and attempt to determine what is occurring to boost the error rate. While our Pareto chart will not tell us what is wrong with any individual question, it will identify questions that have some sort of a problem so that they can be investigated. In any case, by using this method we have more data available to us in order to identify, diagnose and correct any problems.

The same process can be applied to error rates associated with individual trainers. As mentioned earlier, one of the requirements for this effort to be a success is that each trainer must follow the mock script exactly as it is written. Using a Pareto chart such as the one displayed in Figure 2, we can easily determine when a particular trainer has strayed from the script (or made any other type of error).

In our example, you can notice that Trainer #7 had an error rate that was above the acceptable range. Again, we do not know the exact cause of the error rate, but can use this information to guide our search. We can assume that since trainees are randomly assigned to a training group that there are no significant differences among the groups. So, we can focus our attention to the identification of any possible trainer affect.

Of course, once we have collected this data, we would naturally want to look at how the entire training process has

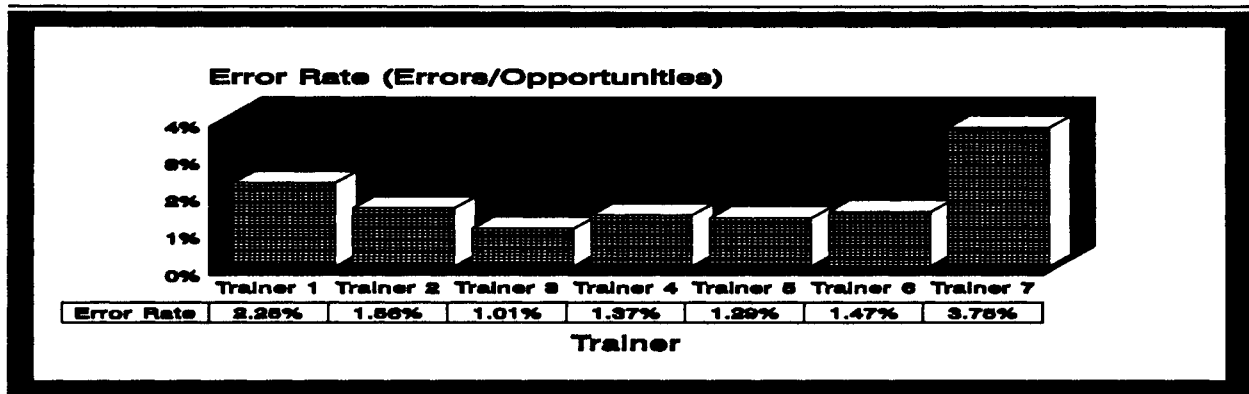
improved over time. For instance, on the NLS survey, interviewers are trained in three waves. Each wave contains six different training groups. So, we can plot the error rates of each group in each wave and identify any improvements in the overall process. To do so, we can use another Pareto chart, such as the one displayed in Figure 3, to compare error rates by training session.

As you can see in the example, each group improved their error rates between the first wave of training and the third wave of training. Since both the trainers and the trainees in the individual waves can vary, the training process is the only constant variable across waves. Therefore, we can assume that the improvements are due to changes in the training process that were made between waves one and three.

Summary and Conclusions

The ideas presented in this paper represent our ideas of the direction in which CAPI training should be heading. The ideas presented are, by no means, meant to be a comprehensive list. Rather, it was our intent to begin a dialogue that will allow us, as an industry, to give some thought to this issue and begin the sharing of information that we believe to be so vital to the success of this effort. We believe that the spirit of information sharing that was present at the NCHS CAPI training workshop in October, 1992 is the key to developing a training model that will allow us to take CAPI "to the next step." We encourage everyone involved in CAPI training at any level to take whatever steps are necessary to implement regular meet-

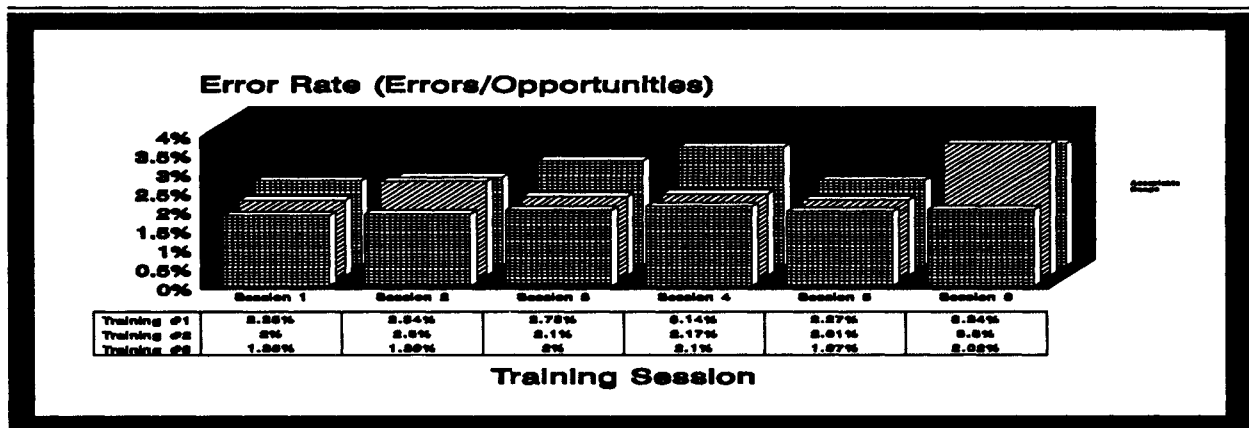
Error Rate by Trainer



■ Error Rate

Figure 2: Pareto Distribution: Error Rate by Trainer

Error Rate by Training Session



■ Training #3 ▨ Training #2 ■ Training #1

Figure 3: Pareto Distribution: Error Rate by Training Session

ings to discuss our progress, both in terms of successes and failures, so that we can continue to move forward with this evolving technology.

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