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ABSTRACT

This paper details the development and psychometric analysis of an instrument used for workshop evaluation. The instrument was designed to assess the effectiveness of the workshops, the instructors conducting the workshop training, and the training materials. The instrument used a Likert agree/disagree format. A psychometric analysis of scores from 584 participants found 2 factors that validated the proposed structure of the instrument. The first factor pertained to the workshops and training materials, while the second factor pertained to the instructors themselves. The Cronbach alpha value for the instrument was 0.88. Recommendations are also made for the generic use of the instrument in various training and assessment environments. The instrument is attached. (Contains 2 tables and 14 references.) (Author/SLD)

DEVELOPMENT OF A WORKSHOP EVALUATION INSTRUMENT

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Abstract

This article details the development and psychometric analysis of an instrument used for workshop evaluation. The instrument was designed to assess the effectiveness of the workshops, the instructors conducting the workshop training, and the training materials. The instrument used a Likert agree/disagree format. A psychometric analysis of scores from n=584 participants found two factors that validated the proposed structure of the instrument. The first factor pertained to the workshops and training materials, while the second factor pertained to the instructors themselves. The Cronbach alpha value for the instrument was 0.88. The authors also made recommendations for generic use of the instrument in various training and assessment environments.

Development of a Workshop Evaluation Instrument

Introduction

In today's instructional and training environment, most corporations are interested in how effective their products and services are in their specific business or industry. Companies spend millions of dollars every year conducting market research to determine customer perceptions and trends. This document is an analysis of one such effort to obtain pertinent, accurate information about how effective a specific training service was to a very specific clientele.

In the late 1990s, a Texas-based computer software company began conducting software training workshops for insurance adjusters. The company management felt that a training satisfaction survey instrument would help determine the effectiveness of the workshops, the instructors conducting the workshop training, and the training materials. Therefore, the authors proceeded to develop a workshop evaluation instrument.

The instrument was used first for a one-day workshop. The workshop was later expanded to a two-day class and then to a three-day class. During this time, the instrument questions stayed the same. However, the authors changed the layout design and font type after the instrument was first used.

As previously mentioned, the purpose of the instrument was to obtain workshop participants' opinions on such specific items as the content knowledge of the instructor, the quality of the workshop materials, and the overall effectiveness of the training sessions.

Method

Instrument Design

The design of the instrument was important, and many factors had to be considered. A Likert type scale was adopted for the instrument to determine the degree of satisfaction or dissatisfaction with each question. The decision was made to use the Likert scale with the descriptors "Strongly Agree"[5], "Agree"[4], "Neutral"[3], "Disagree"[2[, and "Strongly Disagree"[1] for the purpose of determining the participants' perceptions and opinions about training. In an agree/disagree context, Jenkins and Taber (1977) found that the number of response categories above five did not, in any situation, yield a significant increase in Likert discriminability. Neumann and Neumann (1981) concluded from their research that the 5-point scale appeared to be the most convenient to use in attitudinal survey. McKelvie (1978) proposed using five or six categories. He further suggested there was no psychometric advantage in a large number of scale categories, and that discriminative power and validity could be reduced when fewer than five categories were used. The design of the scale focused on the questions being easy to understand and the participants being able to complete the questions in a relatively short time. The instrument was administered at the end of the final day of training. The instrument items follow in their sequential order from item one through item ten: (1) The training room was comfortable, (2) The training materials were easy to follow and understand, (3) The workshop has helped me understand the information flow within the software, (4) I can now write estimates on the DDS Multi-line Pro, (5) The instructor(s) was well organized, (6) The instructor(s) was friendly and easy to listen to,

(7) The instructor(s) answered questions quickly and knowledgeably, (9) Overall, the instructor(s) did an excellent job, and (10) Overall this was an excellent workshop. See the document appendix for a copy of the Workshop Evaluation Sheet.

Instrument questions also assessed the date of the class, the location of the class and the instructor's name. An optional comments section was provided at the bottom of the instrument to allow the participants to note any comments they wished to add. The comments section was labeled with a sentence stating: "Please share any comments that will help us improve the quality of our training sessions. (We Really Want To Know!)" The wording of this sentence encouraged constructive criticism and had the phrase, "We Really Want To Know!" The intent was to let the participants know that the instructors were serious about listening to the participants' comments.

Participants

The sample size for the study was n = 584 participants. The typical participant at the workshops was an insurance property adjuster or an independent insurance property adjuster. These were individuals who worked on a contract basis with insurance companies or independent adjusting companies to write estimates on damage to residential and commercial properties. The majority of these individuals fell into the category of catastrophe adjuster, meaning they worked property claims where the damage was caused by natural or man-made disasters such as hurricanes, hail and wind storms. This profession usually attracts individuals who have a strong construction background in order to understand structures and structural damage. The average independent adjuster, as well as those in the training sessions, was someone typically age 40 or older. This is because of the tremendous amount of time away from home that the job requires (some

storm duties may last over a year). It is also a profession that requires long hours of work. Adjusters assess property damage during the day and write estimates, reports, and call insureds in the evening.

Procedure

As is standard with most evaluative participant surveys for seminars or workshops, the instrument was given at the end of the last day of instruction. Generally the session instructor pre-filled the date of the workshop, the instructor's name, and the class location. When first utilized, the instrument was handed out after all the training was completed. The problem with this method of distribution was that most individuals were in the process of packing up their belongings and preparing to leave the class. Because of this some of the surveys were filled out very hurriedly, and there were very few added comments. This caused some concern about the accuracy of the collected data; therefore, the instrument was added at the end of the training workbook, and the participants were told about the evaluation instrument during the class orientation. On the last day of class, immediately after the last exercise, the participants were asked to turn to that page of their workbooks. They were asked to complete the survey, remove the survey page, and leave it at their workstations. This method proved to be much more effective than the previous distribution method, and the responses seemed to be much more thought out. It was also noted that the comments section of the survey seemed to be utilized much more with this method of application. The input that was received was consequently very helpful in fine-tuning the training sessions themselves.

Results

Data Analysis

The authors used the SPSS principal components program (SPSS, Inc., 2001) to examine the factorial validity of the instrument. Nunnally (1967) noted that some researchers refer to construct validity as "factorial validity." Furthermore, factor analysis is an attractive method for evaluating validity because it focuses on the reliable components of test data (Gorsuch, 1983). Thompson (1989) noted that the "common variance" represented by indices of association tended to represent reliable variance, and since it is from these indices that factors are extracted, it follows that factors tend to be constructed from the "true score" components of variables.

A fundamental question that has to be addressed is whether different solutions will emerge when different factoring procedures are used. This question can be rephrased to ask when performing a principal components analysis versus a principal factor analysis whether different factors will emerge if the researchers put 1.00s in the main diagonal rather than communalities. It should be noted that the number of variables in the analysis itself affects the degree of difference between the two analyses. That is, the proportion of entries involving the diagonal of the correlation matrix becomes increasingly smaller with larger variable sets. For example, with five variables, 20% (5/25) of the entries involve the diagonal; however, with 10 variables, only 10% (10/100) of the entries involve the diagonal. Gorsuch (1983) stated that when there were a large number of variables having moderate communalities, the differences were negligible. Cliff (1987), Diekhoff (1992), and Velicer and Jackson (1990) noted that researchers seldom see substantial differences using these two different procedures.

Determining the number of factors to extract from the correlation matrix is a fundamental decision in any analysis (Thompson & Borrello, 1986). Most researchers follow the recommendations of Guttman (1954) and extract all factors with eigenvalues greater than one. The criterion has been shown to be quite accurate when the number of participants is greater than 250 and when the mean communality is greater than or equal to 0.60 (Stevens, 1986). In this study, there were about 600 participants, and the mean communality was 0.65. Consequently, all principal components with eigenvalues greater than one were extracted and rotated using varimax criterion. Individual items were retained if they had a factor structure coefficient greater than or equal to l 0.50 l. The first principal component yielded two components. The prerotation eigenvalues for the components were 5.04 and 1.47. The first rotated component accounted for 37.5% of the variance, while the second rotated component accounted for 27.5% of the variance. The cumulative explained variable was 65.0%. See Table 1 for the descriptive statistics for the instrument items. Table 2 presents the correlation matrix for the items, and Table 3 presents the rotated principal components matrix. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.89, which was greater than the 0.5 value needed for a satisfactory factor analysis to proceed. A Bartlett's test of sphericity was performed to test the null hypothesis that the original correlation matrix was an identity matrix. The value 3057.83 was significant at the 0.000 level. Therefore, it was concluded that the correlation matrix was not an identity matrix and that it was appropriate to use factor analysis as a multivariate analytical technique.

In addition to using component analysis to assess the appropriate conceptual variables and instrument dimensions, in psychometry there is also the need to assess the reliability

of the instrument scores. Cronbach (1970) cited .50 as the minimum reliability value necessary for the evaluation of group data. Anastasi (1976) wrote that it was desirable for reliability coefficients to be in the range of .80s to .90s. The Cronbach alpha value for the item scores on the instrument was 0.88. This is certainly a most appropriate reliability value.

Discussion

The findings presented in Table 3 show that the instrument was comprised of two factors. The first factor consisted of questions one through four on the instrument. The second factor was comprised of questions five through nine. The items in the first factor pertained to the workshop and the training materials, while the items in the second factor pertained to the instructors themselves. Question number ten was a summative question stating, "Overall this was an excellent workshop." This item had a factor loading of .523 on factor one and .560 on factor two. As a summative question, this factorial complexity for the factor loadings would be expected. The mean for the first four questions was 4.18 (between Agree[4] and Strongly Agree[5]). The mean for questions five through nine was 4.66 (between Agree[4] and Strongly Agree[5]). The mean for all ten questions was 4.45 (between Agree[4] and Strongly Agree[5]).

Because of the age of the participants, most were not as computer literate as those individuals who were in the 20s or 30s. Instrument question number four stated, "I can now write estimates on the DDS Multi-line Pro." This question had a lower rating than question number ten, "Overall this was an excellent workshop." On the surface, this would seem to be a contradiction; however, it shows that even though the workshop was

perceived as very helpful and informative, the participants' lack of computer skills hindered them from stating that they were competent using the software. To address this issue, the training sessions should be lengthened by at least one day. The first day's session should be devoted to training in computer skills and the Windows' environment.

For general use of the instrument, one could change the wording slightly for questions three and four for the specific workshop situation. Question three could be reworded to say, "The workshop has helped me understand [what has been presented]." Question four could be reworded as, "I can now [do a specific behavior or task]." These slight modifications will make the questions generic in application and use for various assessment environments. Question 10 should remain as it is currently stated.

Conclusion

The study focused on a psychometric analysis of a 10-item instrument designed to evaluate workshop training. The findings suggest that there are two dimensions for the instrument. The first factor was a general cluster of items that pertained to the workshop itself and the training materials. The second factor was a cluster of items that focused on the instructors. Furthermore, the authors reported the psychometric properties of the instrument including descriptive statistics, the correlation values for the items, the rotated factor loadings for the items, and the Cronbach alpha score reliability measure. The instrument was found to be a useful measurement scale with excellent psychometric properties. Suggestions were also offered for slight wording modifications for questions three and four to make the questions generic in application for various assessment environments.

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TABLE 1

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
VAR00001	584	1.00	5.00	4.1952	.8197
VAR00002	584	2.00	5.00	4.1901	.6804
VAR00003	584	1.00	5.00	4.3750	.6099
VAR00004	584	1.00	5.00	3.9966	.7748
VAR00005	584	2.00	5.00	4.5325	.5639
VAR00006	584	3.00	5.00	4.6712	.4985
VAR00007	584	3.00	5.00	4.7500	.4527
VAR00008	584	3.00	5.00	4.7140	.4816
VAR00009	584	2.00	5.00	4.6353	.5325
VAR00010	584	2.00	5.00	4.4452	.6312
Valid N (listwise)	584				

Table 2
Correlation Matrix

		VAR00001	VAR00002	VAR00003	VAR00004	VAR00005	VAR00006	VAR00007	VAR00008	VAR00009	VAR00010
Correlation	VAR00001	1.000	.376	.327	.258	.309	.220	.233	.272	.269	.336
	VAR00002	.376	1.000	.605	.528	.433	.336	.299	.334	.395	.486
	VAR00003	.327	.605	1.000	.511	.436	.361	.353	.377	.390	.461
	VAR00004	.258	.528	.511	1.000	.338	.219	.203	.195	.288	.431
	VAR00005	.309	.433	.436	.338	1.000	.661	.543	.637	.682	.586
	VAR00006	.220	.336	.361	.219	.661	1.000	.623	.636	.672	.493
	VAR00007	.233	.299	.353	.203	.543	.623	1.000	.757	.589	.402
	VAR00008	.272	.334	.377	.195	.637	.636	.757	1.000	.710	.465
	VAR00009	.269	.395	.390	.288	.682	.672	.589	.710	1.000	.627
	VAR00010	.336	.486	.461	.431	.586	.493	.402	.465	.627	1.000

Table 3

Rotated Component Matrix[a]

	Component	
	1	2
VAR00001	.181	.535
VAR00002	.214	.806
VAR00003	.263	.755
VAR00004	5.694E-02	.798
VAR00005	.744	.373
VAR00006	.823	.184
VAR00007	.821	.126
VAR00008	.872	.158
VAR00009	.816	.288
VAR00010	.523	.560

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 3 iterations.

Workshop Evaluation Sheet

SA for Strongly Agree
A for Agree
N for Neutral
D for Disagree or
SD for Strongly Disagree

Write the response for each item that best describes your thoughts about the training workshop.

Date: ____ / ____ / ____ **Location (City/State):** _____
Instructor's Name: _____
Item

1. The training room was comfortable _____
2. The training materials were easy to follow and understand _____
3. The workshop has helped me understand the information flow within the software _____
4. I can now write estimates on the DDS Multi-line Pro™ ____
5. The instructor(s) was well organized ____
6. The instructor(s) was friendly and easy to listen to ____
7. The instructor(s) was knowledgeable about the software ____
8. The instructor(s) answered questions quickly and knowledgeably ____
9. Overall, the instructor(s) did an excellent job ____
10. Overall this was an excellent workshop ____

Please share any comments that will help us improve the quality of our training sessions. (We really want to know!)

Comments:

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