Using Interval Manager Mobile Application in Saving Time and Cost

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ABSTRACT

The Interval Manager (INTMAN - Mobile Workforce) is a mobile-assisted Utility that replaces the traditional paper-and-pencil strategies to gather fixed c language time-sampled observational information. An initial application that compares INTMAN - Mobile Workforce with the traditional method of paper-and-pencil was presented in this article. Smart Devices were used to run INTMAN - Mobile Workforce data collection application while a Microsoft Windows run using desktop was used to analyse the data. Changed frequencies, durations percent, conditional probabilities, and kappa settlement matrices and values were the analyses carried out. the contrast among INTMAN - Mobile Workforce and the traditional paper-and-pencil technique was primarily based on 5 dimensions: setup time, statistics entry duration, length of inter-observer agreement calculations, accuracy, and price. the outcomes show the efficiency and accurateness of the computer-assisted data collection system over the conventional technique for Time-sampled records.

Keywords: *Mobile Application, Interval Manager, INTMAN - Mobile Workforce, Information Systems.*

I. INTRODUCTION

Interval Manager or INTMAN - Mobile Workforce encompasses an observational Mobile Application that is employed for time-sampled statistics. This method is appropriate for behavioral research projects that require the researcher to perform direct observation. Traditionally, this type of data is gathered using the methods that involve paper and pencil [1]. With more and more reasonable hard-ware options applicable within an expansive range of educational and community-based settings, computer-assisted direct observation programs are now extensively and readily accessible**.**

Computer-assisted data collection has been claimed as better than the traditional methods, but the empirical studies that compare both data collection methods (the computer-assisted and the traditional methods) in general, or Specially the techniques of time-sampling on the scale related to investigate issues inclusive of efficiency, accuracy, and fee, appear to be very confined [2].

An observe of social interplay and making a song amongst cowbirds as compared using a traditional paper-and-pencil records collection technique and voice popularity generation (VRT). the assessment turned into made among the time for information input and inter-observer settlement. from the results, the (VRT) method confirmed greater time efficiency, main to notably greater accurate inter-observer settlement [3]. The conventional and computer-assisted methods have been used within the evaluation of the accurateness of non-permanent time sampling as opposed to actual-time statistics series. however, the study did not don't forget the advantages and downsides of the employed methods. the look at additionally did no longer hire a much broader set of dimensions, whilst choosing between the conventional and pc-assisted techniques [4].

Accordingly, this paper will present mechanisms of Interval Manager (INTMAN - Mobile Workforce) Mobile Application which has been developed for facilitating the time-sampled data collection. Additionally, the outcomes generated by a preliminary study that made an evaluation between NTMAN - Mobile Workforce with the conventional way of manage the data and daily work is application built on 5 dimensions' installation, information entry period, length of inter-observer agreement, calculations, precision and price [5]..

II. INTMAN - MOBILE WORKFORCE

INTMAN - Mobile Workforce is a Mobile Application that Turned into designed to ease the gathering of time-sampled information inside the sector. This Mobile Application comprises the component of collection and the component of analysis, where the former is operated using smart devices with the application of Windows CE, while the latter is operated using computers that runs with Windows 98 or higher operating system. For the operating system, INTMAN - Mobile Workforce can be run using the minimum hardware requirements. Handheld computer is used in collecting the data, and these collected data are then transferred to the desktop computer. The data are stored and analysed by the desktop computer. Microsoft Windows operating system controls and using to run the programs [6].

INTMAN - Mobile Workforce Application employs the clock in the hand held computer. it additionally employs a sequence of drop-down containers on the hand held computer's touch display. consumer can choose the time program period and the time interval comes in values specifically Observation time and recording, ensuing in an information record with a column of codes for all categories for whenever program period at some stage in the consultation. meanwhile, session period is ascertained through first deciding on the quantity of time durations to reap. moreover, codes are classed into classes which need to be similarly exceptional every because it isn't always viable to simultaneously choose 2 codes. In this regard, INTMAN - Mobile Workforce is able to show and gather 22 categories of codes at maximum and each category carries 20 codes at maximum [9].

A code file is applied as control to what is shown on the screen of the handheld computer. In INTMAN - Mobile Workforce, a standard text editor is applied to create the code files. Windows Notepad is among the commonly used program. The code report comprises the codes and their screen labels, and information numbers [10]. This can be exemplified using a state of affairs of simple direct observational collection of records with a sincere three-class coding device that is built to guide a take a look at of aggression in faculties, addressing the problem this take a look at, the potential codes for the primary class are as follows: 1) aggression took place (throughout the "examine" duration), and a pair of) no aggression happened (during the "study" duration). the capacity codes for the second one category are as follows: 1) classroom, 2) playground, and three) transition [11]. the potential codes for the 0.33 class are as follows: (1) trainer gift, and (2) teacher absent [12]. all of the classes are proven on the display screen as picks inside a drop-down listing box for every class. whilst the exam time starts, the computer makes the "observe" sound. the elegance is found by means of the observer till the smart devices makes the "report" sound. for the duration of the length of look at, the observer would decide the specific state for every class [13].

III. OBSERVATION

For analysis purposes, the gathered information is transferred to the laptop pc, and there are 3 analyses worried namely frequency evaluation, inter-observer agreement, and conditional chances. the dataset idea is applied within the evaluation application, and the dataset contains the outcomes documents (output) collectively with the set of commentary information files. Observation data are then processed into a result file, with the use of analysis application. Utilizing the analysis program toolbar, the dataset is created. The files are selected and named [14].

For the duration of the frequency evaluation, the listing of commentary documents is processed right into an end result document. the result document carries the full frequencies of every code for each class. for every record, the sums may be presented as totals and/or as a mixed document. for the documents result, both applied into forms of records and spreadsheet [15].

The function of inter-observer agreement analysis is to tally the agreements, interval by interval, and this is done for all categories. So that it will enable clean show of disagreements in the course of a consultation, a kappa matrix is provided. Computation percentage as settlement indices. Additionally, sessions can be combined in order to provide the full figure of agreement.

probationary chances quantify the code frequencies of pairs of categories which might be taken into consideration collectively. exemplified by the coding device above, the periods amount wherein aggression passed off with teacher present rather than the periods quantity wherein aggression passed off with teacher absent would be provided via this evaluation [16]. With the application of the frequency counts, the observed aggression probability being a function of teacher presence is presented in the outcomes.

IV. RELATED FEATURES

INTMAN - Mobile Workforce can equally analyze the data obtained from digital video. For the reason, the pro-coder DV device and records collected from an older operating system version of INTMAN - Mobile Workforce can be employed. meanwhile, datasets of files can be stored for usage later on. furthermore, the evaluation software is ready with a built-in information file editor. therefore, the records may be edited utilizing the display screen labels. therefore, there's no need to

make use of the numeric representation of those statistics from the statistics record.

V. METHODOLOGY

A field-test was carried out on INTMAN - Mobile Workforce. For the purpose, INTMAN - Mobile Workforce was directly compared with the Modified Observational Record of the Caregiving Environment. ORCE Incorporates a paper-and-pencil direct observational protocol for program period coding, and ORCE has both been standardized and demonstrated. in comparing the 2 techniques, two educated creditors of information coded three 10-minute period video segments from preferred video records of children in home-based totally infant-care settings. right here, each segment of video became coded with ORCE, after which with INTMAN- Mobile Workforce use of smart devices, or vice versa – it has to be referred to that the order changed into randomized. 5 Dimensions have been hired in evaluating the two methods. these dimensions were: setup time, information access period, kappa calculations length, accuracy, and fee value.

ORCE rated the quantitative and qualitative variables related to early child care. Specially, it scrutinized the houses of the kid's experiences inside the infant-care environment. for the purpose, the frequency of particular behavior directed through the caregiver and different youngsters toward the target toddler and specific behaviors confirmed by way of the goal baby turned into recorded. this changed into done by way of score the first-rate of the behavior of caregiver and that of the child, in the environment, and the whole toddler-care placing weather. the behavior (frequency) scales record the occurrence and/or level of key behaviors in the regions of: language-targeted interaction, development stimulation, toddler's compliance, infant's hobby, infant's interaction(s) with peers, and behavior management. a complete of 44 mints become spent to finish ORCE where the behavior scales took half-hour of the general time spent. the 30 minutes had been cut up into three 10-minute segments. for the duration of this time, coders could watch the behavior of goal infant at some point of 30 seconds and then make notes of it for 30 seconds. Hence, the basis of choosing 3 10-minute segments was established for the purposes of comparison.

VI. RESULTS

The reported outcomes entail comparisons per subject. In regards to the time of session setup, the opening setup for both systems was about 20 seconds, which was brief. Notably, it took a lot of time to set up the first working version of ORCE, especially in regards to the arrangement of code inside boxes to allow observers to score, etc. INTMAN - Mobile Workforce does this process automatically. In regards to data entry terms duration, only 30 minutes were required in entering the observational data into SPSS when INTMAN - Mobile Workforce was used. On the other hand, the use of paper-and-pencil method for similar task took 1 minute 30 seconds. Also, INTMAN - Mobile Workforce required significantly less time to compute. Methodology found specifically that 180 seconds, while the paper and pencil method took 55 minutes.

The computation time for INTMAN - Mobile Workforce Kappa turned into additionally compared with a standard program for kappa computation. here, uncooked information was entered into the program, and the process took 15 minutes. Notably, the accuracy of the data obtained using INTMAN - MOBILE WORKFORCE remained the same (no degradation) as oppose to the accuracy of those obtained using the method of paper and pencil. In this study, accuracy relates to the exactness of inter-observer agreement that is computed via kappa from the 3 10-minute segments of videotape. In general, INTMAN - MOBILE WORKFORCE Completed of 0.88, at the same time as ORCE carried out a total kappa of 0.79. Lastly, in terms of cost, the use of INTMAN - MOBILE WORKFORCE initially incurred considerable cost at \$450, in addition to the cost of smart devices with accessories amounting to \$190. This amount incurred was considerably higher than the amount spent for the paper-and-pencil method which only required the purchase of papers and pencils. However, using INTMAN - MOBILE WORKFORCE would save a median of one hour really worth of labor in keeping with issue in step with consultation of commentary. in this regard, thinking about that the average salary turned into 21\$ per hour, the usage of INTMAN - Mobile Workforce could save more or less 22\$ in earnings in keeping with consultation of commentary in keeping with subject. as such, the use of INTMAN - Mobile Workforce on an undertaking comprising 20 subjects with 20 factors of observation might save kind of 9250\$.

VII. ANALYSIS AND FINDINGS

The application of INTMAN - Mobile Workforce which encompasses an observational application has been demonstrated inside this article. Among the primary features of INTMAN - Mobile Workforce are flexibility in ascertaining the selection and amount of accessible codes, in addition to options of analyses that comprise modified frequencies, Percent of durations, conditional chances, as well as Cohen's kappa coefficients to index observer settlement. The use of INTMAN - Mobile Workforce requires certain cost associated with the

start-up particularly the cost associated with the acquisition of hardware and an upper limit in the quantity of available classes of codes (22 confined by display screen length and pull-down menu bars), but inner each category, 20 special codes may be programmed.

A preliminary takes a look at became achieved in this examine and the performance of INTMAN - Mobile Workforce was in comparison with that of ORCE that's the standardized paper-and-pencil time-sampled device. the results proved the superiority of INTMAN - Mobile Workforce in terms of time efficiency, accurateness, and long-term fee efficiency to the traditional paper-and-pencil approach, for the same undertaking (time-sampled records collection). subsequently, this text shows considering the timescale of a given assignment and any imminent deliberate initiatives, whilst determining the statement systems and series techniques to be hired. on this regard, the undertaking to be examined may additionally recollect such as recurrent measures over positive sizeable timescale. also, the sample to be used ought to be at the least five. except that, the initial funding in observational utility and hardware as a cost-effective and efficient substitute to the traditional methods of paper-and-pencil can be taken into account as properly

VIII. CONCLUSION

Technological innovations generally have the capacity in furnishing the much sought-after assistance to researchers in the application of direct observation in behavioral research that is aimed at measuring the actual behaviour of respondents. Based on the preliminary study carried out, the computer-assisted methodology appears to supersede the traditional methods that employ paper and pencil. In this regard, a number of important dimensions are to be considered in order to achieve broader research scope. However, in the use of technology, clear guidance is important. For instance, clear research questions with their corresponding analytic plans would be necessary. Arguably, computer-assisted technologies would furnish researcher with more amount of data as opposed to the traditional paper-and-pencil method. Still, it should be noted that technology cannot replace a research design. Rather, it only improves it.

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REFERENCES

[1] Wu, X. H., Wang, J. Q., Peng, J., & Qian, J. (2018). "*A Novel Group Decision-Making Method With Probability Hesitant Interval Neutrosophic Set And Its Application In Middle-Level Manager Selection*". International Journal for Uncertainty Quantification, 8(4).

[2] El-Ebiary, Y. A. B., Al-Sammarraie, N. A., Al Moaiad, Y., & Alzubi, M. M. S. (2016, October). "*The impact of Management Information System in educational organizations processes*". In 2016 IEEE Conference on e-Learning, e-Management and e-Services (IC3e) (pp. 166-169). IEEE.

[3] Roman, A. V., Van Wart, M., Wang, X., Liu, C., Kim, S., & McCarthy, A. (2018). "*Defining e-leadership as competence in ICT-mediated communications: an exploratory assessment*". Public Administration Review.

[4] El-Ebiary, Y. A. B., Najam, I. S. M., & Abu-Ulbeh, W. (2018). "*The Influence of Management Information System (MIS) in Malaysian's Organisational Processes—Education Sector*". Advanced Science Letters, 24(6), 4129-4131.

[5] Wu, B., Yu, X., & Hu, Y. (2019). "*How does principal e-leadership affect ICT transformation across different school stages in K-12 education: Perspectives from teachers in Shanghai*". British Journal of Educational Technology, 50(3), 1210-1225.

[6] El-Ebiary, Y. A. B., Al-Sammarraie, N. A. & Saany, S. I. A. (2019). "*Analysis of Management Information Systems Reports for Decision-Making. (IJRTE), 8(IC2), pp. 1150-1153.*

[7] *Yassin M., & El-Ebiary, Y. (2018). Electronic Enterprise Future for IT and Business Environments*". International Journal of Contemporary Computer Research, 2(1), 10-14.

[8] Cohen, G. (2019). "*Principals' leadership behaviours that shaped teachers' motivation to implement an educational ICT reform imposed by state authorities in Israel*". Israel Affairs, 1-17.

[9] El-Ebiary, Y.; Najam, I.; Abu-Ulbeh, W. (2018). "*The Influence of Management Information System (MIS) in Malaysian's Organisational Processes—Education Sector*", Advanced Science Letters, 24(6), pp. 4129-4131(3).

[10] YAB EL-EBIARY (2016). "*Management Information Systems And Their Importance In The Decision-Making*". International Journal of Latest Engineering and Management Research (IJLEMR), 1(7) PP. 10-14.

[11] Raman, A., & binti Shariff, S. (2018). "*Relationship Between Technology Leadership, ICT Facility, Competency, Commitments Towards Effectiveness of School Mangement Tasks in Schools*". PEDAGOGIA: Jurnal Pendidikan, 7(1), 4-11.

[12] Zenab Ahmat Oumar, Najeeb Abbas Al-Sammarraie and Yousef A.Baker El-Ebiary, (2016). "*Students Satisfaction Factors On E-Learning Management System at Al-Madinah International University (MEDIU)*". The International Journal of Information Research and Review. 3(11), pp3046-3052.

[13] Yousef El-Ebiary (2015). "*Development of information systems in data archiving and re-called in e-government sector in the State of Indonesia*". International Journal of New Technologies in Science and Engineering (IJNTSE), 2(4).

[14] Yusuf, B., Sailin, S. N., & Mohamed, A. H. (2019). "*Embracing Successful ICT Integration Through MIC Transformational Model: Exemplary Practices of a Malaysian School Leader*". In Predictive Models for School Leadership and Practices (pp. 193-218). IGI Global.

[15] Gorman, C. A., & Chavez Reyes, D. (2018). "*Full Range Focus: How Regulatory Focus Influences the Relationship between Leader Behavior and Subordinate Outcomes*". ARBS 2018 PROCEEDINGS, 1, 36.

[16] El-Ebiary, Y. A. B., Abu-Ulbeh, W., Alaesa, L. Y. A., &Hilles, S. (2018). "*Mobile Commerce in Malaysia— Opportunities and Challenges*". Advanced Science Letters, 24(6), 4126-4128.