Analysis Ideas of SPSS And CAI

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Abstract

The study is to demonstrate and discuss the educational advantages of Computer Assisted Instruction (CAI) and Statistical Package for the Social Sciences (SPSS). An experimental design compared learning outcomes of participants in an introductory statistics course that integrated CAI to participants in a statistics course. The Statistical Package for the Social Sciences SPSS and is a comprehensive system for analyzing data. This package of programs is available for both personal and mainframe computers. SPSS package consist of a set of software tools for data entry, data management, statistical analysis and presentation. SPSS integrates complex data and file management, statistical analysis and reporting functions. SPSS can take data from almost any of file and use them to generate tabulated reports, charts, and plots of distributions and trends, descriptive statistics, and complex statistical analysis.

Keywords Computer assisted instruction, Statistical Package for Social Science, teaching introductory statistics, Teaching in higher education,.

Introduction

Introduction to statistics courses serve as a general introduction to descriptive and inferential statistics theory and practice. In traditional classroom-based statistics courses, much of the learning comes from reading the selected particular textbook, attending lectures and taking notes regularly. Recent technological developments, however, offer instructors an additional method for teaching introduction statistics' content and practice. Computer-assisted instruction (CAI) continues to increase, eventually offering several advantages. Some of the benefits of using CAI include emphasis on active learning, enrichment of collaborative learning, encouragement of greater students independence and task-based teaching.

Learning Statistics

The range of learning and assessment activities used in statistics classes has been extended to include group discussions, 'real life' simulations, problem solving and worksheets. They emphasize that this has take place because of recent discussion about the critical role of assessment in statistics education. They believe that "assessment activities usually focus on the task or statistical idea and learning activities also need to include an emphasis on the students' understanding of learning statistics". They also argue that "focusing on the students' knowledge, rather than on the lecturer's ideas of important content, is the characteristic of a flexible learning environment that encourages students to develop higher conceptions of learning".

The learning in statistics in six qualitatively different ways. They pointed out that these ways of experiencing learning in statistics move from a disjointed conception such as "doing required activities in order to pass or do well in testing" towards more holistic conceptions for example "using statistical concepts in order to understand areas beyond statistics" or "using statistical concepts in order to change students' views".

Computer Assisted Instruction

Several researchers have studied CAI in teaching statistics, for example: Mathematical statistics, biostatistics, social statistics and even business statistics with different level. Some of the aspects of CAI were also studied in the investigations, including teaching statistics with laboratories, and using spreadsheets, for example EXCEL, instead of particular software programs such as Minitab or SAS. Recently, researchers have begun to combine and compare CAI with programmed instruction/ distance learning approaches.

Many design issues arise when evaluating the efficacy of CAI. They pointed out that one of the most pernicious is possible selection bias when comparing two classes that receive different treatments. After a thorough review of literature,

Harrington emphasized the quality of relationship between student and instructor during the instruction needs to be observed and accounted. Duncan, recommended that some participant variables that should be controlled: Interest in the subject, prior knowledge of an area, generalized anxiety, and computer anxiety. Liefeld and Herrmann controlled academic major, number of previous courses in the major, score on an English aptitude test, and semester grade point average in their relational research. Literature shows that some researchers have matched groups for equality on critical variables. For example, Underwood and Underwood, matched groups on IQ scores, pretest of ability to classify objects and reading ability. Trowbridge took into account, grade point average, gender, age and family income in his research.

The impact of CAI participation was assessed with identical Midterm and Final exams for both groups. All items in Midterm and Final examination were covered in lecture and text. However, some items in both exams were also addressed by CAI experiences. As a result, both testing scores produced two indices of student outcomes: General examination score and examination score for CAI-supplemented items. It is predicted that students with the Lecture-plus-CAI section would outperform students in the Lecture-only section.

Constructivism and Relational Learning Theory

Computer laboratory was developed to help students engage with statistical ideas supported by constructivist and relational learning theories. Learning is not understanding the "true" nature of things, nor is it remembering weakly perceived perfect ideas, but rather a personal and social construction of meaning out of the mystifying array of sensations that have no order or structure besides the explanation that we fabricate for them, the relational view suggests that students understand learning only in relation to their perception of their learning situation and the subject area. Relational learning theory agrees that learning can be done through assimilation and accommodation where old information can be adapted to create new experience by facilitating learning through the arrangement of information. Since learners have different personalities, general aptitudes and knowledge of a subject area, they will progress at different rates. Therefore, effective learning can occur when students engage their interest with the content. When interest is associated to learning, the information will be remembered and applied in real life experiences.

The application of learning statistics using SPSS may benefit students by empowering them to develop their own understanding of statistics concepts. Students will have the opportunity to learn by constructing their own ideas and knowledge from the statistical software experiences, with supportive direction from the lab instructor. Students who are actively involved in their own learning usually become more

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independent learners and problem solvers.

SPSS as a Laboratory Software Program

SPSS introduced the first mainframe statistical software package to appear on a personal computer. In addition, SPSS was the first package released of statistical products for the Microsoft Windows personal computer operating system. SPSS recently received the 2002 Illinois High Tech Award for statistical software innovation. It is used in statistical education particularly for social science courses in areas such as psychology, sociology and education. SPSS will carry out almost all statistical analyses required at a professional level, and certainly covers all that would be needed in a first statistics course. It is particularly good for analysis of questionnaire data.

SPSS OVERVIEW

The SPSS stands for Statistical Package for the Social Sciences and this is a comprehensive system for analyzing data. SPSS package consists of a set of software tools for data entry, data management, statistical analysis and presentation. SPSS integrates complex data and file management, statistical analysis and reporting functions. SPSS can take data from almost any type of file and use them to generate tabulated reports, charts and plots of distributions and trends, descriptive statistics and complex statistical analysis.

About SPSS:

SPSS is a multinational software company that delivers "Statistical Product and Service Solutions." Offering the world's best-selling desktop software for in-depth statistical analysis and data mining, SPSS also leads the markets for data collection and tabulation.

Customers use SPSS products in corporate, academic and government settings for all types of research and data analysis. The company's primary businesses are: SPSS (for business analysis, including market research and data mining, academic and government research);

SPSS Science for scientific research; and SPSS Quality for quality improvement.

SPSS has offices, distributors and partners worldwide. Products run

on leading computer platforms, and many are translated into Catalan, English, French, German, Italian, Japanese, Korean, Russian, Spanish and traditional Chinese.

FEATURES OF SPSS

Ø   It is easy to learn and use.

Ø   It includes a full range of data management system and editing tools.

Ø   It provides in-depth statistical capabilities.

Ø   It should have input data.

Ø   It offers complete plotting, reporting and presentation features.

Ø   It should have number of step.

Ø   It should be able to generate the correct result.

SPSS makes statistical analysis accessible for the casual user and convenient for the experienced user.

Applications of SPSS Software for Social Work Research:-

Psychology: - Develop models to understand how drug, clinical & art therapies affect.

Medical & healthcare Research variables confidence, savings: - Best predicts a doctors support for prescribing generic drugs.

Social Science: - Study how socio-economic status, organizational membership & other determinants influence differences in voting behavior & political engagement.

Educational Research: - evaluate training program impact on classroom effectiveness.

Market planning: - Create econometric & financial models & analyze factors affecting workplace, job attainment.

Program evaluation: - Evaluate program outcomes or behavioral models using regression.

Operating system supported windows.

Institutional research: - Study how work-related issues affect job satisfaction.

SPSS (Statistical Package for Social Sciences) Analysis Services:

·   Market sizing & Consumer Insight Survey Reports

·   Information Research & Database Maintenance

·   Team of Statisticians, PhDs & Business Analysts

·   Expertise in Secondary & Online Research

*SPSS (***Statistical Package for Social Sciences***)* has evolved, from statistical software to a very powerful management tool. The capability of the SPSS Software Package for analysis makes it an indispensable part of every decision making process of a company. The decision to invest in the SPSS software package means additional expenditure not only on the software, but also towards hiring trained professionals, to manage this genie efficiently. This is where Our professionals can handle SPSS Analysis software requirements. By outsourcing SPSS analysis and data mining, we get the best of both worlds. We can tap into our knowledge pool of experienced professionals while using the **software** to take major decisions with a high degree of confidence.

Statistical analysis using SPSS

This is how to perform a number of statistical tests using SPSS. Each section gives a brief description of the aim of the statistical test, when it is used, an example showing the SPSS commands and SPSS output with a brief interpretation of the output. for a table that shows an overview of when each test is appropriate to use. In deciding which test is appropriate to use, it is important to consider the type of variables that variables are categorical or interval and whether they are normally distributed.

Statistical Software Packages

It has been estimated that 90% of all statistical analysis is performed by computers. The computer can perform statistical calculations more easily, more quickly and more accurately than people using calculators or other devices. The time saved in using computers can be devoted to the more important task of data analysis. Although computers do not make mistakes, at least most of the time, people who write programs collect data and enter data can and do make them. If poor data or faulty programs are introduced into the computer, the results are likely to contain errors and may be meaningless. Serious researchers have generally come to see the computer as an invaluable tool of their trade and anybody attempting to do quantitative studies would be wise to take the time to become proficient in using a statistical computer software package. Given the proliferation of microcomputers in schools and colleges, equipment is generally available with the appropriate statistical software packages for prospective researchers to practice and to learn how to use them. It is not the intent here to provide a training program in the use of statistical software. Most of the popular software packages come with their own tutorials and help facilities and do a much better job than can be accomplished here. Instead, some of the most important features of the very popular SPSS package will be presented.

Statistical Package for the Social Sciences (SPSS)

SPSS is probably the most popular statistical software package ever developed. It is available in practically every college computer center and is increasingly being used in private businesses even though it was originally designed for use by social scientists. The Statistical Analysis System (SAS) is another very popular statistical software package used by researchers. Either one is appropriate for the vast majority of statistical applications used in educational research studies. SPSS will be used to demonstrate the basic components of most statistical software packages.

1. Data Preparation

The first step in preparing and organizing data for computer processing is determining what data is needed, from what source(s) and how it will be collected. The distribution

of the study population (i.e. national population, one school, one class), will all have a significant impact on data collection activities. Generally, the larger the sample size or the more data elements needed or the wider the distribution of the population; the more difficult it is to collect and to control the accuracy of data. In preparing data for computer processing, it is necessary to identify a data format or layout for the cases to be used in the study. The data format should be well-planned and carefully done. Once established and data is collected, it rarely is ever changed. The major purposes of a data format are to define:

i.   What type of data (i.e. numeric, alphabetic, etc.) is being used for each data element;

ii.   How many characters are being used for each data element;

iii.   Where each data element is located in the data record.

A sample of a data format statement which was used with SPSS to analyze data for a study on the use of microcomputers in New York public schools. It was based on a survey mailed to building principals. For students who have some familiarity with computers, the DATA LIST statement should appear as being straight-forward and very similar to data formats they have used or seen with other computer software packages.

Once a DATA LIST statement has been established, the researcher needs to collect the data and enter it into the computer. There are many ways to accomplish this. Most researchers will use some type of database or word processing software. A sample of the actual data used with the DATA LIST statement.

2.   Data Analysis

SPSS provides a number of statistical procedural programs for doing a wide variety of analyses. A partial list of the most commonly used programs is as follows:

o ANOVA - Analysis of Variance

o CORRELATION - Co relational Analysis (i.e. Pearson's Product Moment Coefficient)

o CROSSTABS - Cross tabulations, Chi-Square

o FREQUENCIES - Frequency Distributions, Graphs, Charts

o MEANS - Measures of Central Tendency (i.e. Means)

o ONEWAY - Oneway Analysis of Variance

o PLOT - Plot Regression Lines

o REGRESSION - Regression Analysis

o T-TEST - t-test

Build a complete system for the data analysis process...

SPSS has products empowering to work in each stage:

· Save time and money with planning and prioritizing product or advertising features

· Collect/enter data - even on the Web - efficiently: **SPSS Data Entry**

· Get to analysis faster with easy data access and comprehensive file restructuring: **SPSS Base**

· Get ready for analysis quickly with efficient data management and preparation: **SPSS Base**

· Analyse data using a variety of statistics and procedures for more accurate models: **SPSS**

· Clearly report your results to the people who can use them: **SPSS Base,**

· Share results with others - on the Web or in presentations or publications: **SPSS Smart**

Why purchase SPSS software from Technologies Targeting

SPSS's broad range of capabilities for the entire analytical process gives you answers spreadsheets and databases can't. With SPSS, you can generate decision-making information quickly using powerful statistics, understand and effectively present your results with high-quality tabular and graphical output, and share your results with others using a variety of reporting methods, including secure Web publishing. All this empowers you to make smarter decisions more quickly by uncovering key facts, patterns and trends.

Over the past 30 years, people like you have used SPSS for data mining and database analysis, market and survey research, and research of all types because SPSS is the best software for solving business and research problems using statistics.
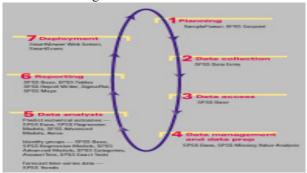
Get breadth and depth with SPSS

SPSS is a modular, tightly integrated, full-featured product line for the analytical process — planning, data collection, data access and management, analysis, reporting and deployment. Using SPSS with a combination of add-on modules and stand-alone software that work seamlessly with the base product enhances SPSS' capabilities. The graphical user interface (GUI) makes it easy to use — yet it gives you all of the data management, statistics and reporting methods need to do even the toughest analysis.

A broad range of capabilities for the analytical process

There's much more involved in data analysis than just doing analysis. Most likely, before you do analysis you have to get data ready, and then, once analysis is complete, you need to put results into a format people can use. If you're using software that's limited in its capabilities, you have to cobble together products from a variety of vendors to get your job done. Wouldn't it be easier to get all products for

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the analytical process from one place? SPSS can give you everything you need for the analytical process — from planning to data management to analysis to sharing results — and it all works together.

The analytical process shows the steps involved to get your data ready for analysis, analyze, report your data and share results. The products available for each stage are shown above and links to each product page are below. SPSS' extensive product offering means you can chose the software that best meets your data analysis needs.Using all SPSS products streamlines the entire analytical process. Because SPSS products work together, you won't have to duplicate work that might be required when using products from a variety of vendors. For example, you have to re-enter variable labels (such as, gender or income level) when collecting data, again when doing analysis and then again when creating a report. Once you enter variables labels in SPSS Data Entry, you won't have to set up variable labels again throughout the process — and you can concentrate on analysis instead.**Productivity-enhancing tools of SPSS**SPSS is as flexible as it is powerful and can be adapted to your teaching environment.Consider the following:i.

SPSS makes test administration tasks more productive. SPSS can be used in the interactive mode wherein the kinds of tables and data transformations illustrated in this paper can be accomplished on the fly. This method is useful for researchers who are interested in more in-depth analyses. An intuitive Windows interface makes these tasks simple – even for first-time SPSS users.ii.

SPSS can be customized for increased flexibility. When appropriate, each of these procedures can be easily added to the menu bar.iii.

SPSS can also run in production mode. This is useful, for example, if you are interested in running the same item analysis procedures every time you administer a test.**Statistical items of importance**One would want the "correctness" of a particular item on a test to be associated with a high overall score. Taken from a different angle, you may prefer "frequently answered correctly" test items from

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students who did well on the test overall. This association between individual test item and overall test performance is called the point biserial correlation. A more useful correlation is the overall test performance computed excluding the particular test item in question. This measure is called the corrected point biserial correlation of a test item.**SPSS provides a measurement of the internal consistency of the test items**SPSS gives test developers a means of measuring consistency. SPSS provides a measurement of internal consistency of the test items called Cranbach's Alpha. The higher the correlation among the items, the greater the alpha. High correlations imply that high scores one question are associated with high scores on other questions. Alpha can vary from 0 to 1, with indicating that the test is perfectly reliable. Furthermore, the computation of Cronbach's Alpha when a particular item is removed from consideration is a good measure of that item's contribution to the entire test's assessment performance. Statistics are automatically generated using a procedure called Reliability.

Conclusions

The Statistical Association curriculum guidelines, for example, for undergraduate programs in statistical science require familiarity with a standard software package and should encourage the study of data management. However, in undergraduate courses the use of such software is often neglected and packages – which are more familiar to students – are employed as standard tools. Since this software allows basic statistical analysis it is unfortunately common that students graduate without learning to use dedicated statistical packages. Our experience fully demonstrates the need for software packages to teach introductory statistics courses. This is especially true for students who will usually face complex data analysis problems in their professional activity, such as students of Social Work, Management, Biology and Medicine. We strongly suggest the use of this package for statistics teaching. This is mainly motivated by the free software license of this software package. Every interested teacher can obtain a copy of the software and distribute it to the students without economics concerns. The use of a dedicated statistical package can help students familiarize themselves with it from the beginning of their studies and can lay the foundations for the future use of more complex statistical research.

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